

TRANSPERSONAL PSYCHOLOGY RESEARCH REVIEW: PSYCHOACTIVE SUBSTANCES AND TRANSPERSONAL STATES

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This "Research Review" covers recent trends in researching psychoactive substances and trans personal states of consciousness during the past ten years. In keeping with the stated goals of this section of the *Journal* to promote research in transpersonal psychology, the focus is on the methods and designs which are being employed in investigations rather than the findings on this topic. However, some recently published books and monographs provide good summaries of the recent findings relevant to understanding psychoactive substances (Cohen & Krippner, 1985b; Dobkin de Rios, 1984; Dobkin de Rios & Winkelman, 1989b; Ratsch, 1990; Reidlinger, 1990).

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Because researching psychoactive substances is most broadly a cross-disciplinary venture, only a small portion of the research reviewed below was conducted by persons who consider

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themselves transpersonal psychologists. As Vaughan (1984) has noted, "The transpersonal perspective is a meta-perspective, an attempt to learn from all different disciplines . . . emerging from the needed integration of ancient wisdom and modern science. . . . It is cross-cultural and inter disciplinary" (pp. 24-25). Psychoactive plants have been used by humans for tens of thousands of years during which time their use has been intimately associated with religion and ritual. Their molecular structures are related to the structure of naturally occurring neurotransmitters in the brain; their effects are primarily on consciousness. Hence research ranging from the chemistry laboratory to field work in shamanic cultures to self-experimentation have all contributed to understanding the relationships between psychoactive substances and transpersonal states.

*transpersonal
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A misperception still maintained by some is that transpersonal psychology does not share the same goals as psychology in general in following the tenets of science. Brewster Smith (1990) recently wrote, "In transpersonal psychology the humanistic movement finally cast anchor from its founders' aspirations for a humanistic psychological science. . . it was setting itself up as a religion and losing touch with the science of psychology" (pp. 13-14). However, transpersonal psychology is precisely that branch of psychology which maintains that "reports of transpersonal experiences and behaviors can be studied scientifically" (Krippner, 1990, p.3). However, it explicitly rejects total reliance on the methods used in natural science (especially as these methods are perceived by academic psychologists) and limitations on what can or should be studied (Walsh, 1982). Topics such as mysticism, meditation, ASC, shamanism and psychoactive substances have been successfully studied from the perspective of transpersonal psychology because this branch of psychology has developed both theories and methods (discussed later) suited for their investigation. One researcher has even suggested that, "We may best explore psychoactive drugs from a vantage point which gives consideration to the transpersonal dimensions of the profound human experience which these substances evoke" (Yensen, 1990, p. 13).

In reviewing the research in this area one often encounters statements such as: "Since the beginning of the 1970s, there has been little new research into psychedelic substances" (Ratsch, 1990, p. 6; also Nichols, 1987). Certainly research of the nature and caliber of the classic studies by Leary and Metzner (1967-1968) on prisoner rehabilitation, Pahnke and Richards (1966) on the induction of mystical experience, and Masters and Houston (1966) on subjective aspects of psychedelic drugs are

not currently possible. However, despite the virtual ban on their use in research with human subjects in the U.S. and elsewhere, there has been a major resurgence of research activity in the past ten years. New discoveries in neurochemistry, anthropology and transpersonal psychology have led to significant new findings in many areas, but especially in ethnopsychopharmacology and archeopsychopharmacology. The use of psychoactive substances to assist psychotherapy has continued in Europe. The latter research has been disseminated primarily at conferences and not in the major journals; hence it is unknown to most persons outside this network. Therefore, this review will consider research generated from these sources as well as other areas where research has continued, with a focus on the methods employed.

DEFINITIONS

Psychoactive Substance

The choice of the term psychoactive is intended to sidestep the difficulties inherent in labeling such substances more finely. Names descriptive of their broad impact on humans include psychedelic, psychotomimetic, psycholytic, entheogen, entactogen, empathogen, phantastica and adaptogen. Drugs have also been classified by their short-term subjective effects (e.g., hallucinogens, deliriant, stimulants, sedatives), by their site of action (e.g., serotonergic, dopaminergic) or their mechanism of action (e.g., agonist, antagonist). Other classification systems rely more on the chemical composition of the psychoactive substances (e.g., opiates, tryptamines, indoles, betacarbolines, phenylethylamines, cannabinols) (Stafford, 1983). They can also be classified as either synthetic or natural. Most naturally occurring psychoactive substances are alkaloids derived from plants, but a few come from the animal kingdom, such as the foam of the toad *Bufo alvarius*, which contains 5-Meo-DMT. There is even controversy about which substances should be labeled in these categories. For example, some advocate that a wide range of plants be included in the category of hallucinogens (Emboden, 1972), while others argue that many of these are "quasi-hallucinogens" at best (D. McKenna, 1990). In addition, the pharmacokinetics of many psychoactive plants have not yet been investigated (Schultes, 1978).

*substance
classification
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A wide range of psychoactive substances have been employed to induce transpersonal states. Hallucinogens are the category of substance most commonly associated with such states, but deliriant, narcotics, empathogens, stimulants (such as khat

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and coffee amongst traditional Sufis), and alcohol have also been used ceremonially to induce transpersonal states (Furst, 1976;Schultes & Hofmann, 1979).As the anthropologist Luis Luna (1984) found when he questioned a group of shamans about their use of plants, "all psychoactive plants are considered potential teachers" (p. 140). The issues involved in classification could easily constitute a review in itself. Therefore, we have chosen to utilize the most general term, psychoactive, to refer to substances which affect the central nervous system and have the capacity to facilitate the induction of transpersonal states, particularly when used in a ceremonial or psychotherapeutic context. However, when researchers have utilized a different descriptive term (e.g., psychedelic), then that name has been used to present their findings.

Transpersonal States

Grof (1985) has described four levels of consciousness: sensory, biographical, perinatal, and transpersonal. The biographical domain includes unconscious material related to events which retain a strong personal emotional charge. The perinatal encompasses experiences associated with the birth process. Both the perinatal and biographical are of great significance to both psychology in general and psychotherapy in particular. While the effects of psychoactive substances range over all four domains, the focus of this review is on their relationship to the transpersonal:

Transpersonal phenomena reveal connections between the individual and the cosmos that seem at present to be beyond comprehension The common denominator of this otherwise rich and ramified group of phenomena is the subject's feeling that his or her consciousness has expanded beyond the usual ego boundaries and has transcended the limitations of time and space" (Grof, 1985,p. 127-29).

Transpersonal experiences can also include experiential extension beyond the framework of "objective reality" including archetypal experiences and complex mythological sequences. Krippner (1990) has defined the transpersonal operationally to encompass "experiences and behaviors [which] reflect concerns that transcend the personal, reflecting a group or even humanity as a whole; these experiences and behaviors are given the highest possible priority or value by those reporting them" (p. 3).

Psychoactive substances have "the ability to produce changes in the individual's awareness of reality, which leads the individual to a perception of a spiritual, mystical, timeless,

transcendent reality and of being at one with the universe" (Dobkin de Rios & Winkelman, 1989a, p. 4). Transpersonal states have also been observed during therapy sessions in which psychoactive substances were employed, even before transpersonal psychology developed explanatory frameworks for them starting in the late 1960s:

It is hard ... to appreciate the difficulties that we faced in the late fifties and early sixties, exploring LSD psychotherapy equipped with the conceptual framework and world-view of Freudian psychoanalysis. Almost every day, we were confronted in psychedelic sessions with new and puzzling phenomena such as sequences of death and rebirth; intrauterine, ancestral, racial, and phylogenetic memories; animal and plant consciousness, or past-incarnation experiences (Grof, 1980, p. 121).

It is this capacity of psychoactive substances to facilitate transpersonal states which is being considered in this review.

SELF-EXPERIMENTATION

A striking feature of the research on psychoactive drugs is the virtually universal ingestion by the psychologists, artists, scholars and chemists themselves of the substances they are studying. Self-experimentation, or conducting bioassays as it is technically termed, is a research tradition in medicine in general (Altman, 1987). For example, self-experimentation has played an important role in unraveling the chemistry of psychoactive substances. The isolation of the psychoactive component of peyote in 1897 was achieved when Arthur Heffter made this identification by systematically ingesting a number of alkaloid "fractions" made from peyote; animal testing had been inconclusive. Some sixty years later, Albert Hofmann faced the same situation when asked by Wasson to isolate the active ingredient from the psilocybin mushroom: "I decided to answer this most essential question through self-experimentation. . . . The reasons why all of the other laboratories failed at isolating the active principles of this mushroom lay in the fact their attempts relied solely upon tests conducted with animals" (Hofmann, 1990, pp. 6-7).

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of
bioassaying*

The tradition of bioassaying psychoactive plants to determine their effects continues. Through this method, Bianchi (Festi & Bianchi, in press) was able to establish seasonal alterations in the psychoactive effects of *Amanita muscaria*: "In the mushroom picked in September the narcotic and physical effects were predominant whereas in August the 'visionary' and psychedelic effects were more highlighted."

The first account of "peyote inebriation" (by a European) was published by the physician and novelist Weir Mitchell in 1897, who sent peyote buttons to Havelock Ellis. This pioneer in psychological and sexual studies in turn wrote two articles on the influence of peyote for the *British Journal of Medicine*. William James utilized nitrous oxide in his explorations of the nature of consciousness and of religious experience. The early research on the psychological effects of LSD involved extensive self-experimentation, starting with Albert Hofmann himself and then by psychiatrists and psychologists. The vast majority of researchers investigating psychoactive substances, both as psychotomimetics in the early 1950s and later as adjuncts to psychotherapy, self-experimented (Stafford, 1983; Stevens, 1987). Aldous Huxley, Walter Houston Clark and Alan Watts also reported utilizing psychedelic drugs in their philosophical and religious explorations.

Nichols (1987), a leading psychopharmacologist, has pointed out that, "experimentation by private physicians has been, at least until recently, a source of drug discovery" (p. 35). He laments that the discovery of new types of medication that might prove useful in the practice of psychiatry is hampered by the ban on human research-which includes self-experimentation. It has been argued that, "Apart from artificial sweeteners, psychedelica is the only class of substance which is relatively inaccessible to animal experimentation. As a result, self-experimentation by the responsible researcher remains the final criterion, and is thus irreplaceable" (Coral, 1990, p. 138).

*participant-
observation
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Despite the prohibitions against human research with psychoactive substances, utilization of self-experimentation has continued into the recent era of research covered by this review. In contrast to an earlier era of anthropological research which emphasized the objective aspect of participant-observation research, it has become a widely accepted practice in mainstream academic research that university trained and affiliated anthropologists studying ritual and ceremony ingest psychoactive substances as part of their investigation. The rationale is given that ingestion of psychoactive substances is necessary to understand and verify reports of visionary experiences and to establish rapport with other participants whose experiences are being researched (Dobkin de Rios, 1972; Taussig, 1987).

A recent example is Andritzky (1989) who underwent a four-month training period with an ayahuasca healer in Peru during which time the neophyte had to ingest the ayahuasca every other day. He described how the healer Felipe prepared him by reciting hour-long accounts about the world of the mythologi-

cal people. Andritzky (1989) reported that, during an ayahuasca session,

the author saw Felipe lying in his hammock in the guise of a jaguar while he explained his songs. . . . During the ayahuasca intoxication all of nature seems converted into an anthropomorphic drama, and the myths sung by the shaman are experienced multisensorially as absolute reality. The hallucinogenic vitalization and the synesthetic perception of the mythological events by various sensory systems immensely strengthen the power of symbols to reorganize the personality ... the legends are not only heard, but seen in their full vitality and experienced with their emotional impact!" (pp. 79, 84).

Andritzky (1989) used the results from his self-experiments to make comparisons between "visionary experiences during ayahuasca intoxication" and their "experiential representation in transpersonal psychotherapy" (p, 84).

In psychoactive substance-assisted psychotherapy research, self-experimentation continues to play an important role. Peter Bauman, the President of the Swiss Association for Psycholytic Therapy, describes the procedure by which MDMA was first investigated when it became available: "We used it in our meetings of the Society [European College for the Study of Consciousness]. First we did mainly drug sessions for ourselves, to familiarize ourselves with it" (Zanger, 1989a, p. 3).

*self-
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substance-
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COMPUTER SEARCHES FOR RESEARCH ARTICLES AND BOOKS

To obtain references to journal articles and books that report research on psychoactive substances and transpersonal states, we conducted a search of various computerized bibliographic databases. Since, as noted above, this topic extends beyond disciplinary boundaries, we first utilized *Dialindex* which searches the titles, subject headings, abstracts (when present) and key words (when present) in around 300 computerized indexes. We selected the terms: psychoactive or psychedelic or hallucinogen or drug, which had to be present together with one of the following terms; ritual or ceremony or shaman or mystical or religious. This method only generates information on *how many* appropriate references appear in the databases. To our surprise, the results indicated that we should conduct additional searches of the same databases we had utilized in our previous Research Review article on mystical experiences (Lukoff & Lu, 1988): PSYCINFO, MEDLINE, and RELIGION INDEX. None of the other indexes showed enough references to warrant searching them.

In addition, we searched Dissertation Abstracts and the Social Science and the Arts and Humanities Citation Indexes. For the Citation Indexes, we selected three books: *LSD Psychotherapy* (Grof, 1980), *The Botany and Chemistry of Hallucinogens*, (Schultes & Hofmann, 1980) and *The Road to Eleusis: Unveiling the Secret of the Mysteries* (Wasson, Hofmann, & Ruck, 1978). The searches generated all books and journal articles which have referenced any of these three books. The research which is abstracted below was accessed from these computer searches and from suggestions by the persons who are acknowledged at the beginning of the article.

*four
major
Content
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The rest of this review is divided into four sections, each covering a major content area of research: 1) neurochemistry of transpersonal states; 2) quantitative psychological research; 3) psychotherapeutic and medical applications; and 4) human sciences research. Each area has been investigated with several methodologies. In areas such as ethnographic research where many studies have been conducted, an abstract from an exemplary article or book was selected to illustrate the investigative approach and the findings achievable from this methodology.

1. NEUROCHEMISTRY OF TRANSPERSONAL STATES

Cohen and Krippner (1985a) have pointed out the importance of psychoactive drugs as research tools: "LSD could be used to study the action of neurotransmitters, cortical hemispheric interaction and the interplay of the cortex, limbic system and brain stem" (p. 215). Grof (1990) considers their potential value to research in psychology and psychiatry as comparable to that of the microscope in biology and the telescope in astronomy. One might expect that with the political and theoretical ascendancy of biological psychiatry and psychology in this era (which the National Institute of Mental Health has declared "The Decade of the Brain") researchers would make extensive use of psychoactive substances in their quest to understand the brain. During the past ten years, the virtual ban on research on psychoactive substances with human subjects has greatly hindered any progress which might have been achieved with their experimental use.

Yet, psychoactive substances have been used to explore the neurochemistry of transpersonal states in limited ways. By tracing the paths of psychoactive substances through the nervous systems of animals using radioactive markers and other analytical techniques, it has been discovered that the

brain produces endogenous neurotransmitters which are analogues of most of the psychoactive drugs people use; e.g., hallucinogens (0 MT), amphetamines and cocaine (both dopamine and norepinephrine), some tranquilizers (GABA), opiates (endorphins) (Mandell, 1978; Nichols & Glennon, 1984). These findings raise important questions about the nature of reality and the definition of "natural." Hofmann (1986) has suggested that people can perceive new realities with the aid of psychedelic substances by attuning their "receivers" to even more "transmitters" which will allow them to take up new information from the environment. Based on these discoveries, ethnobotanist Dennis McKenna (personal communication, 1990) has broached the question of whether consensus reality is a serotonin hallucination!

The existence of identical psychoactive substances (e.g., DMT) in species ranging from mushrooms to higher plants to animals and the human brain as well has also been established (Weil, 1986). Shulgin has commented on the federal prohibition against peyote which proscribes "every compound" of this plant:

If this were pushed to a point of legal absurdity, since dopamine is a compound of the plant, and since it's a mandatory neurotransmitter in our normal functions, it would mean in a very humorous way we would possibly all be possessors and carriers of a schedule I drug in our normal, healthy state (cited in Eisner & Stafford, 1987).

These findings have also led to questions about the definition of "natural" as it pertains to the common perception that drugs are "unnatural" (Weil, 1986).

*the
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of
"natural"*

Also in the 1980s, there has been a search for final common neurochemical pathways involved in both drug-induced and non-drug transpersonal states (Dobkin de Rios & Winkelman, 1989b; Prince, 1982). In contrast to the set and setting oriented researchers, some working in this area have been impressed by the "universality" and sameness of psychoactive drug experiences across cultures and history. For example, Mandell (1978), after reviewing the experimental and clinical studies of common underlying neurobiochemical pathways in "transcendent states," suggested that "A world view [is] conveyed by using a brain chemical agent" (p. 73).

One psychoactive substance which received much attention in the literature during the first half of the 1980s was MDMA (see Shulgin, 1986) for a review of the history and chemistry of this compound).

NICHOLS, D. (1986). Differences between the mechanism of action of MDMA, MBDB, and the classic hallucinogens. Identification of a new therapeutic class: Entactogens. *Journal of Psychoactive Drugs*, 18(4), 305-13.

The author, along with Shulgin, was the first to publish findings regarding MDMA's actions in human studies. In this paper Nichols argues that MDMA belongs to a new class of laboratory synthesized drugs which share some properties with both hallucinogens and stimulants, but are similar to neither in their significant effects on humans. He proposes the term "entactogen" for this new class to highlight their primary effects in enhancing interpersonal experiences.

*the
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hallucinogen*

The psychoactive components and pharmacokinetics of many plant-based psychoactive substances including snuffs, smokes, beverages and enemas, have received much attention in the 1980s. One substance that was subjected to intensive laboratory investigation is ayahuasca, also known as the "visionary vine," from the Amazonia region of South America. It is probably the most widely used hallucinogen in the world today.

McKENNA, D. & TOWERS, G. (1985). On the comparative ethnopharmacology of malpighiaceae and myristicaceae hallucinogens. *Journal of Psychoactive Drugs*, 17(1), 35-39.

Ayahuasca is a hallucinogenic beverage derived by boiling the bark of *Banisteriopsis cappi* together with leaves of various admixture plants. In an attempt to understand its mechanism of action, the first author travelled to Peru to collect samples of the plants and the brewed drink. The authors note, "It is remarkable that, faced with so many variables, ayahuasqueros all across Peru manage to manufacture a drug having a high degree of pharmacological consistency from batch to batch" (p. 36). Analysis of the samples also supported the contention of Shulgin, Schultes and others that the hallucinogenic properties of ayahuasca results from a synergistic interaction among the various constituents; specifically, that it results from an oral activation of the DMT through the inhibition of MAO by the betacarbolines. On the other hand, the samples of snuffs and pastes made from Myristicaceous resins varied in both alkaloid constituents and concentration, with many samples seeming to lack psychoactive effects. The authors speculate that this difference is due to the fact that ayahuasca has been incorporated into mestizo folk medicine and its traditions of preparation have continued, whereas Myristicaceous drugs have not made this transition into mestizo culture and its use has diminished or disappeared in tribal societies due to outside influences. In addition, the mechanism of action of these pastes and snuffs has not been determined.

II. QUANTITATIVE PSYCHOLOGICAL RESEARCH

Prior to their virtual ban as research tools, psychoactive

substances, particularly psychedelic drugs, had an important influence on cognitive psychology. Cohen and Krippner (1985a) have lamented that many potentially key studies utilizing psychedelic drugs to investigate inner experiences such as fantasy, imagery and dreams as well as the core mental processes of consciousness and attention have yet to be undertaken.

Similarly, the use of personality and other psychological tests to examine the effects of psychoactive substances, a method which had been used extensively in past studies (Krippner, 1985; Stevens, 1987), has yielded hardly any published research in the past ten years,

However, there is probably a wealth of data available for analysis from the research which was conducted when studies on psychoactive substances were permissible and supported by grants. Most studies collect more data than is ever analyzed, and many interesting findings could be culled from the data collected in prior investigations. The Albert Hofmann Foundation is establishing archives for the storage of data from previous studies which would be available to researchers for further analysis. The following study illustrates the value of such recycling.

*data
collected
in prior
investigations*

JANIGER, O. & DOBKIN, D. R. (1989). LSD and creativity. *Journal of Psychoactive Drugs*, 21(1), 129-34.

The authors (a psychiatrist and an anthropologist) worked with an art historian to investigate the effect of LSD on artistic style and creativity. They developed a detailed coding system to assess artistic productions which were created during experiments in the late 1950s in which participants were asked to draw a Deer Kachina doll both prior to and one hour after ingesting LSD. In addition, follow-up questionnaires were administered after one month and one year. Although the art had been displayed and discussed in the literature on LSD, it had not been subjected to a systematic analysis of the stylistic and creative changes. "The most significant change was noted in those artists whose styles were initially representational or abstract to more expressionistic or nonobjective. Other changes noted included the following: relative size expansion; involution; movement; alteration of figure/ground and boundaries; greater intensity of color and light" (p. 129). "A review of the follow-up information shows that, in many instances, the artists . . . felt that the LSD experience produced some desirable lasting change in their understanding of their work, which continued to influence the form and direction of their artistic development" (p. 133).

OXMAN, T., ROSENBERG, S., SCHNURR, P., TUCKER, G., & GALA, G. (1988). The language of altered states. *Journal of Nervous and Mental Disease*, 176(7), 401-08.

The authors collected 66 autobiographical accounts of schizophrenia, hallucinogenic drug experiences, and mystical ecstasy as well as 28 autobiographical control accounts of important personal experiences. These texts were coded into 83 lexical categories using the General Inquirer Computer Content Analysis Program and the Harvard-III Psychosociological Dictionary (Stone, Dunphy, Smith & Ogilvie, 1966). The schizophrenic lexical content was characterized by an altered state of consciousness as a non-normal, illness experience associated with a self-perception of internal badness. "Hallucinogenic drug lexical content demonstrated a preoccupation with a positive visual and auditory perceptual altered state of consciousness evidenced by a high use of the Dense, Space Reference, and Artistic Categories" (p. 408). In contrast, the mystical ecstasy lexical content revealed an overwhelming concern with a powerful, life-altering encounter with God and an altered state of consciousness suffused with a sense of power and certitude. By applying discriminant functional analysis to the data, 84% of the samples were correctly identified by their word frequencies, suggesting the "the subjective experiences of schizophrenia, hallucinogenic drug-induced states, and mystical ecstasy are more different from one another than alike" (p. 401).

Questionnaire

McKENNA, T. (Speaker). (1984). *Bthnobotany*, (Cassette recording). Berkeley, CA: Lux Natura.

Following in the tradition of Tart's (1971) classic study on the experiences of marijuana smokers, the author designed a questionnaire on the effects of psilocybin mushrooms and administered it to 370 mushroom spore print customers. The experience of hearing an audible voice was found to be a dosage-related phenomenon. The threshold varied among individuals with one-half of the respondents reporting hearing a voice after ingesting 8 grams of dried mushrooms.

BOLLE, R. (1988). *Am Ursprung der Sehnsucht*. Berlin: VWB.

Eight students and eight outpatients at a university clinic were administered ketamine in a dosage of 1.4 mg/kg body weight during 3-8 sessions each. Psychological tests were given and the sessions were recorded. On a questionnaire, the most reported experiences were deep relaxation, feeling in another world, and the sensation of floating. The author interprets the session material as indicating that the ketamine facilitated deep regression and brought up images from early infantile stages. No paranoid hallucinatory phenomena or strong aggressive impulses toward others were observed. Fears and aggressive feelings were present in some, but they remained in the intrapsychic realm.

III. PSYCHOTHERAPEUTIC AND MEDICAL APPLICATIONS

Historically, the medical and psychotherapeutic uses of psychoactive drugs have been based on three models: the psychotomimetic, the psycholytic, and the psychedelic. Knauer and Maloney (1913) were the first to attempt systematic study of psychosis by means of a psychoactive drug (mescaline), but this approach did not become a popular means of investigation until LSD was first introduced. Initially psychiatrists believed that LSD could be used as a psychotomimetic which would allow scientific study of experimentally-induced psychoses. Also by taking LSD, psychiatrists hoped they could gain a deeper empathy for their psychotic patients. Later LSD was used as an adjunct to psychoanalytically-oriented psychotherapy in what came to be known as the psycholytic ("mind loosening") approach. Low doses of LSD were given to loosen defenses, intensify the transference, and make repressed memories more accessible (Neill, 1987). While the goal was the resolution of psychodynamic conflicts, many patients in psycholytic therapy had transpersonal experiences. Recently Baumann reported that over half of his patients in psycholytic therapy "go into dreamlike or visionary states, what Grof calls transpersonal" (Zanger, 1989a, p. 10). Grof (1975) himself has stated that the incidence of transpersonal experiences in psycholytic therapy "seems to be directly related to the dosage and number of previous sessions of the subject. They can also be facilitated by the special preparation, set, and setting of the psychedelic treatment technique (p. 14). While transpersonal experiences occur only rarely in early sessions, they become quite common in advanced sessions after the client has worked through and integrated the material on the psychodynamic and perinatal levels. Psychedelic or "mind manifesting" therapy has traditionally used higher doses and fewer sessions aimed at inducing peak or mystical experiences. This approach has been tried with a wide range of patients including alcoholics, drug addicts, and terminal cancer patients (Neill, 1987).

*psychotomimetic,
psycholytic,
and
psychedelic
therapy*

The current legal restrictions on psychotherapeutic research with psychoactive substances stem from adverse publicity and the failure to distinguish between controlled and uncontrolled use of these substances in the past, exacerbated by significant methodological problems in establishing the effectiveness of psychoactive substance-assisted psychotherapy. These difficulties stem from the fact that the FDA has required psychoactive substance research protocols to conform to the double-blind placebo-control model which it considers necessary to prove

the efficacy of drugs which act exclusively as pharmacological agents. Dileo (1985) has pointed out that this may be an inappropriate requirement for a psychotherapeutic technique: "Psychoanalysis, family therapy, behavior therapy, social therapy, and the numerous other forms of psychotherapy could not be practiced today if they required approval by the FDA" (p. 2). The use of psychoactive substances as psychotherapeutic agents rather than as simple pharmacotherapeutic agents presents a relatively new situation. The FDA has not established procedures and protocols for studying and gaining approval for psychoactive substances used as adjuncts to psychotherapy.

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Several authors (Bakalar & Grinspoon, 1989; Yensen, 1990) have discussed the difficulty of conducting double-blind experiments with psychoactive substances, which has been the standard method of demonstrating the effectiveness of pharmacological treatments. The psychological effects of most psychoactive substances are so dramatic that both the subject and the experimenter are quickly unblinded as to which subjects received the psychoactive substance and which the placebo. If a placebo produced the same immediate "experience" as the psychoactive substance to which it is being compared, then the placebo would be the same, for all practical purposes, as the treatment itself. As Bakalar and Grinspoon (1989) noted, "The deeper problem is that a psychedelic drug, like psychotherapy itself, is given precisely to create a certain experience, not to relieve symptoms like a standard psychiatric drug" (p. 49). Psychoactive substances do not work as simple pharmacotherapeutic agents, but instead mediate intense psychological experiences, which in turn result in psychological changes. In contrast, antidepressants, tranquilizers, and antipsychotic medications are believed to act by direct neurochemical effects. "In this respect, as in many others, psychedelic drug therapy resembles psychotherapies much more than it resembles standard drug therapies" (Bakalar & Grinspoon, 1989, p. 48). Thus psychoactive substances need to be evaluated in the context of psychotherapy outcome research rather than in the context of research on drugs which act exclusively as pharmacological agents.

Yet another methodological problem arises from the difficulty in establishing the efficacy of any form of psychotherapy, even without drugs. A double-blind experiment is almost impossible in any psychotherapy research because no one has found a good way to make therapists unaware of whether the treatment they are administering is supposed to be a control. Bakalar and Grinspoon (1989) postulate that, "any possibility of acceptance for psychedelic clinical research will have to wait on improved

scientific standards for psychotherapy research in general" (p. 50).

In addition, the psychotherapeutic research which was undertaken in the past was seriously flawed because it "to an unfortunate extent, failed to consider and/or describe variables beyond the drug and dose used.... [They are] remarkable for the almost total absence of any thorough description of set and setting" (Yensen, 1985, p. 274). Researching psychoactive substances in the same manner as non-psychoactive agents overlooks the influence of extra-pharmacological factors in determining the resulting experience and outcome.

Another issue affecting the research on psychoactive substances has been the attitudes and biases of some investigators-"experimenter effects," as they are termed in the research literature:

In any area where emotion is a major element, distortions become very great; science becomes as distorted as anything else. . . the quality of investigation in the area of psychoactive drugs is terrible ... [due to an] unconscious need to find damaging evidence against those substances. Experiments are then designed to produce information that seemingly confirms the seeded beliefs and fears" (Weil, 1990, p. 68).

*"experimenter
effects"
in
research*

This bias operates at the editorial as well as the experimental level. Walsh (1982b) cites an instance where he submitted a review of various Western and non-Western psychologies to a prominent psychiatric journal and included data on psychedelics which indicated that in some cases, people have found them beneficial: "The response from the editor was to accept the paper provided I removed any reference to positive effects of psychedelics" (p, 23).

Currently despite significant advances in basic psychopharmacology "the lack of human studies prevents relevant clinical applications of such basic research" (Strassman, 1989, p, 19). The only protocols entertained by the U.S. federal funding agencies and given approval by the Food and Drug Administration seem to focus on their drug abuse potential. However, prior to 1985 when MDMA was made a Schedule I drug in the U.S., a number of studies investigated its potential as a psychotherapeutic aid (Grinspoon & Bakalar, 1986). Albert Kurland and Richard Yensen have maintained permission to conduct **LSD-assisted** psychotherapy sessions with cancer patients although funding has not been forthcoming to complete the study.

*most
recent
research
involved
clinical
case
studies*

In contrast, European investigations of psychotherapy assisted by a range of psychoactive substances continued through the 1980s. Jan Bastiaans worked with LSD as an adjunct to psychotherapy in Holland from 1961 until his retirement in 1988. After having worked with LSD longer than anyone in the world, he concluded that LSD therapy is especially indicated for concentration camp survivors, psychosomatic patients with pronounced psychic rigidity, patients for whom several years of classical psychoanalysis has not resulted in significant progress and patients with cancer prone personalities (Bastiaans, 1988). Hanscarl Leuner, another pioneer in psycholytic therapy, utilized LSD in psychotherapy until 1985 when the laws in West Germany changed to prohibit it. Since then he has continued his research with ketamine and non-scheduled MDMA-analogues. (Although the use of MDMA is not permitted, there is no analogue drug act in Germany.) In addition, clinical work and research with psychoactive substances to assist psychotherapy has resumed in Switzerland where, in 1988, the Swiss Physician's Association for Psycholytic Therapy was successful in petitioning their government for licenses to conduct MDMA-, psilocybin- and **LSD-assisted** psychotherapy. Most of the recent research on psychoactive substance-assisted psychotherapy has involved clinical case studies, usually of sequential sessions. While some consider case studies not to be "scientific," others have argued that the case study is at the foundation of and a distinguishing characteristic of research in clinical psychology (Kazdin, 1981). Many of the reports resulting from this work are anecdotal or "empirical," addressing practical questions such as the effects which different drugs, forms of administration, and duration of treatment have on psychotherapy, as well as side effects and long-term effects (Leuner & Schlichting, 1990). As Baumann has pointed out, "The really scientific laboratory research and the psychology ... was done 20 years ago The research we must do now is whether or not it is possible to do LSD work properly over some years without bad things happening" (Zanger, 1989a, p. 10). This work, much of it in progress, is summarized in a recent review by Zanger (1989b).

To promote research and disseminate findings on psychoactive substances and altered states of consciousness, Leuner, in association with Bastiaans, Hofmann, and Ratsch founded the European College for the Study of Consciousness (Buhlstrasse 22A, 0-3400, Gottingen, Germany). They have held an annual symposium on research and therapy with psychoactive substances and altered states of consciousness since 1985 and have published proceedings of three conferences. Abstracts from their 1985 symposium and the 1989 symposium have been published in English:

SCHLICHTING, M. (1990). Report on the fourth symposium of the European College for the Study of Consciousness. *Bulletin of The Albert Hofmann Foundation*, J(4), 12-13.

A wide range of topics were covered including the religious and spiritual dimensions of ASCs, contributions from the basic sciences and therapeutic work with psychoactive substances. Hofmann gave an address entitled, "Can insights into natural scientific truths have psychotherapeutic effects?" Schlichting presented an analysis of the psychodynamics of a case of severe obsessive-compulsive neurosis based upon the subjective contents of the experiences observed during a psycholytic session. Widmer reported on a young female patient whose psychotic features disappeared during therapy with MDMA. Styk described LSD-assisted psychotherapy with a terminally ill cancer patient. Hausner described his clinical experiences using hallucinogenic mushrooms from the genus *Psilocybe* as adjuncts in psychotherapy. Several presenters also discussed transference and countertransference issues, particularly the importance of the therapist working from the "heart" and the danger of narcissistic attitudes among therapists.

LEUNER, H. & SCHLICHTING, M. (1990). A report on the symposium "On the current state of research in the area of psychoactive substances." In C. Ratsch (Ed.), *Gateway to inner space* (pp, 213-40). Dorset, Great Britain: Prism Press.

Topics included: Poggler's discussion of the potential value of psychoactive substances in the field of gerontology; Leuner's comparison of the characteristic profiles of effects and the role which regression plays in a variety of psychoactive substances with a discussion of the implications for selective psychotherapeutic application; Bolle's studies of the experiential phenomena associated with ketamine among a sample of 16 subjects who participated in a total of 64 sessions; Baumann's report on psychotherapeutic usage of ibogaine and his usage of a bioenergetic technique and terminology. In the latter study, Baumann warned against group administration because of his experience of feeling that he was unable to follow each individual's process.

Many clinical studies were conducted with MDMA prior to its reclassification as a Schedule I drug.

*MDMA
clinical
studies
prior to
reclassification*

GREER, G. & TOLBERT, R. (1986). Subjective reports of the effects of MDMA in a clinical setting. *Journal of Psychoactive Drugs*. J8(4), 319-27.

Twenty-nine subjects were referred by their psychotherapists for a session with MDMA. Most sessions were held in the subjects' homes. Before the dose was administered, there was time to establish contact with the therapists and answer questions. Both individual sessions and group sessions were employed. Music was played during the sessions. A follow-up interview was conducted soon after the session and a questionnaire was administered later. The authors present data on self

reported benefits from the session including changes in mood, attitudes, beliefs, relationships, occupations, activities, spiritual and physical practices, substance use and life goals. One subject experienced a post-session recurrence of anxiety attacks that he had suffered in the past. "All nine subjects with DSM-III diagnoses reported significant benefit, with two reporting lasting remission" (p. 326).

*the
only
governmental
permitted
clinical
application*

In the U.S., use of LSD with terminal patients has been the only clinical application which has been permitted by governmental agencies.

KURLAND, A. (1985). LSD in the supportive care of the terminally ill cancer patient. *Journal of Psychoactive Drugs*, 17(4),279-90.

The author reports four case studies of "psychedelic peak psychotherapy" with cancer patients. The treatment began with a series of 6-12 hours of psychological tests and interviews to establish trust and explore philosophical and religious issues with the patient. Then a relatively high dose of LSD was administered (usually 600 ug) because the goal was to induce a peak experience and "small-dose techniques are less effective, as they do not lead to a full realization of the therapeutic potential of the experience" (p. 282). Music was selected in conjunction with a music therapist. The third phase of treatment involved the patient giving a detailed account of the session and additional psychotherapeutic work. Many patients required additional sessions as their disease progressed. Of the four patients whose cases are presented, three had very positive responses including anxiety reduction, catharsis, abreaction and an enhanced sense of the meaningfulness of life; one patient displayed no apparent effects.

Other studies have focused on a broad range of psychoactive substances in psychotherapy.

GROSSBARD, A. (1989). *Evaluation of a shamanic oriented psychotherapy process*. Unpublished doctoral dissertation, California Institute of Integral Studies, San Francisco.

Persons who participated in shamanic oriented psychotherapy which included the use of MDA, MDMA, LSD, psilocybin, ketamine and 2-CB were compared with persons in psychodynamic psychotherapy. The shamanic oriented psychotherapy was conducted by a psychotherapist of Pueblo heritage who also studied with other Native American medicine people and shamans. He used traditional psychotherapeutic techniques (visualization, bioenergetics, Jungian interpretation), nontraditional methods (music, slides, videos, reading of Western fiction and spiritual texts) and techniques from shamanic traditions (fasting, sweat lodge, smoke purification ceremonies) with small groups of 3-7 participants. The sessions, which typically lasted from evening to early afternoon the next day, are described in detail. The Personal Orientation Inventory, Hartman Value Inventory and the Life Outlook Questionnaire were admini-

stered 12-56 months after termination of therapy. The pattern of results significantly favored the sharnanic therapy group,

IV. HUMAN SCIENCES RESEARCH

Since psychology made the commitment in the late 1800s to become a natural science, it has primarily attempted to gain precision and systematization by staying within a laboratory setting or utilizing quantitative measures. Many of the early studies on psychoactive substances were seriously flawed by early researchers' attempts to emulate such experimental paradigms. The "myth of objectivity" that cloaked these studies was maintained by the adoption of hospital-like white lab coats and stark laboratory environments combined with the failure to consider the impact of the psychotomimetic biases of the experimenters. Yensen (1985) has even argued that the extreme influence of extraparnacological factors makes "controlled studies with LSD impractical and unethical" (p. 274).

Metzner (1990) has also pointed out that research on psychoactive substances, even when designed appropriately, cannot be restricted to laboratories-either psychology or chemistry, or to the psychotherapeutic chambers; its usage extends well beyond these structured situations:

What appears unlikely to me is that this kind of controlled psychiatric application will ever be enough to satisfy the inclinations and needs of those individuals who wish to explore psychedelics in their most ancient role, as tools for seeking visionary states and hidden forms of knowledge. The fact that the serious use of hallucinogens outside of the psychiatric framework continues despite severe social and legal sanctions. . . suggests that there is a strong need in certain people, to re-establish their connections with the ancient traditions of knowledge (p, 87).

*research
beyond
structured
situations*

There has been persisting use of drugs outside of medical controls by "psychedelic clusters" from the Club des Haschischins to the contemporary Native American Church (Cohen & Krippner, 1985a). In moving beyond controllable settings to study the as-lived world, researchers must utilize methodologies which can contend with the wide range of phenomena involved in human experience.

At the inception of transpersonal psychology, Maslow (1966) argued that "mechanistic science" "was not incorrect, but rather too narrow and limited" (p. 5). Instead, he advocated "A more inclusive conception of science" which "includes the idiographic, the experiential, the Taoistic, the comprehensive,

the holistic, the personal, the transcendent, the final, etc." (p. 63). Methods designed to describe and understand the full range of as-lived experience have recently come to be termed "human science research" (Aanstoos, 1990; Polkinghorne, 1983), although they have a long history in psychology (Tesch, 1990) and philosophy (e.g., Husserl's dictum: "Back to the things themselves"). Human science researchers do not limit themselves to the narrow canon of methods from traditional psychology but draw upon the methodologies of anthropology, history, and all the other human sciences, which include twenty-six separate disciplines according to Giorgi (1986). And each discipline has established its own tradition of qualitative research (Tesch, 1990). What these methods share is that they are not concerned with variables and their measurement, but rely on interpretive analysis. Such methods are non-quantitative yet rigorous and precise ways to understand the human world. The loss in generalizability, reliability and validity is offset by comprehensive contextual descriptions of human experience.

*"postpositivist
paradigm"
research*

This genre of research has also been described as representing a "postpositivist paradigm" (Lincoln & Guba, 1985) in that "objectivity loses its status as the highest value guiding the design of an investigation. It becomes one of the many criteria against which quality of research is judged" (Tesch, 1990, p. 43). Methods are viewed as analytic tools to hold some aspects of reality still for a moment to permit examination of interesting and helpful patterns while ignoring other aspects of reality.

In the studies reported below, the investigators often did not describe their research as utilizing the human science method into which their study is classified. Methodologies that are similar or even identical can be given different names by the various disciplines, and some people have conducted their research outside of any formal disciplinary allegiance.

Ethnopsychopharmacology

The past ten years have seen a wealth of ethnographic literature related to psychoactive plants and shamanism, healing, and ceremony (Dobkin de Rios, 1984). Understanding of the role that psychoactive plants play in the religious life of many tribal groups has been expanded.

ANDRITZKY, W. (1989). Sociotherapeutic functions of ayahuasca healing in Amazonia. *Journal of Psychoactive Drugs*. 21(1),71-89.

The use of ayahuasca in group rituals to enhance social cohesion was described as: "the common, collective ingestion of the drug by all adult members of a community, with the aim of strengthening social cohesion and identity through periodic symbolic regression to the "powerful time" of mythical origin. . . . These periodic ceremonies are the best structured institutions of the socioreligious life" (p, 82). The author compares Grot's (1985) model of transpersonal psychotherapy to experiences during ayahuasca rituals and finds them functionally equivalent: "The process of ayahuasca healing, with a nonverbal ritual defined working stage and snort conversations in the beginning and/ or at the end, finds its analogy in the transpersonal therapeutic situation" (p. 84).

LUNA, L. (1984). The concept of plants as teachers among four Peruvian shamans of Iquitos, Northeast Peru. *Journal of Ethnopharmacology, II, 135-56.*

The author conducted intensive interviews concerning the nature and identity of the magic plants four shamans utilized in healing ceremonies, the dietary prescriptions they followed, how shamanic powers are transmitted, the nature of their helping spirits, and the magic melodies given to them by the plant teachers. All insisted that the spirits of the plants taught them what they know. One had never had a shaman as a teacher. Each knew from 60 to over 100 magic songs which the plants had taught them in the native languages. Songs are used to heal sickness, attract the love of another, call the spirits of dead shamans, cause rain, gain hunting and fishing success, cure snake bites, etc. A listing of their plant teachers is included.

LAMB, F. (1985). *Rio Tigre and beyond*. Berkeley, CA: North Atlantic Books.

This is the author's second book on the healer Manuel Cordova, a mestizo who was abducted by and grew up among the Indians of the Western Amazon of Peru. It goes further into depth about aboriginal ethnopharmacology covering in detail native use of ayahuasca in rural and urban areas, curare, vermifuge je and many other methods of curing with plants. Chapters on Cordova as a shaman and on the potential benefits to Western medicine from the indigenous medical practices involving biologically active plants are also included. It also contains a *Materia Medica* of plants investigated during Lamb's trips with Cordova through the Peruvian jungle.

TAUSSIG, M. (1987). *Shamanism, colonialism, and the wild man: A study in terror and healing*. Chicago: University of Chicago Press.

The first part of this book is an account of the terror, torture and killing meted out by the Peruvian Amazon [rubber] Company around 1910. Then it turns to a study of the Indian hallucinogenic healers in the 1970s, the author's own experiences with yage (ayahuasca), and the social psychology of healing and sorcery. "But perhaps more important is the stark fact that taking yage is awful: the shaking, the

vomiting, the nausea, the shirring, the tension. Yet it is a wonderful thing, awful and unstoppable. . . . In the excretions are visions. The stream of vomit, I had often been told, can become a snake. . . . In the streaming of nasal mucus, in the shirring, in the vomiting, in the laughter as in the tears, there lies a sorcery-centered religious mythology as lived experience, quite opposed to the awesome authority of Christianity in its dominant mode as a state religion of submission" (pp, 406,412).

a
blind
spot
with
regard to
indigenous
use

Despite the research contributions on this topic, some researchers show evidence of a blind spot with regard to indigenous use of psychoactive plants.

WINKELMAN, M. & DOBKIN DE RIOS, M. (1989). Psychoactive properties of !Kung-Bushmen medicine plants. *Journal of Psychoactive Drugs*, 21(1), 51-59.

The authors point out that the topic of psychoactive drug use has been overlooked in recent ethnographic accounts of the *kia* healing ritual. Yet their review of the pharmacopeia of the !Kung Bushmen revealed that "Almost half of the !Kung medicine plants contain psychoactive substances" and probably play a role in trance induction (p. 51). "Western researchers unfortunately have suffered from cultural blinders, which has resulted in their avoiding or distorting data by denigrating altered states of consciousness (ASe), particularly those associated with the use of drugs" (p. 51). Comparison with the earliest accounts of !Kung ceremonies where drug use was reported led the authors to conclude that, "recent cultural change has been responsible for changes in the !Kung healing practices, including a reduction or elimination of psychoactive plant use" (p. 56).

Ethnohistory

RATSCH, C. (1990). Die "Orientalischen Frohlichkeitspillen" und verwandte. Berlin: Verlag fur Wissenschaft un Hi/dung.

When "joy pills" from the Orient first arrived in Europe in the 1800s, they created quite a stir for their ability to create a sense of well-being and as an aphrodisiac. The author reconstructs the recipes of the joy pills and related concoctions to analyze their psychotropic and pharmacological effects. Although a wide range of psychoactive plants and flavoring agents are utilized in these pills, they usually contain some combination of datura, opium and cannabis. Such formulations have a long history in the East, and were actually introduced to Europe for the first time in the Middle Ages and were termed "Theriak." The flying ointments of witches were composed of these same ingredients, and some contemporary cough medicines have formulations that closely resemble "joy pills." The author conducted two experiments where he administered a typical joy pill blend of psychoactive substances to groups of four persons, including

himself, and reports on the subjective effects induced. These included oceanic body sensations, visual illusions and sexual arousal.

SIEGEL, R. & HIRSCHMAN, A. (1984). Hashish near-death experiences. *Anabiosis- The Journal for Near Death*, 4(1),69-&6.

The authors review the historical literature on hashish-induced near-death experiences (NDEs), translating some selections from early French accounts for the first time. Based on the historical recipes and United Nations Narcotics Commission assays of hashish from the Middle East and France, the dosages of THC employed by the 19th-century French and American researchers were 9-18 times as high as contemporary social-recreational smokers of marijuana leaves and stems. Many subjects in these early experiments had experiences of dying, death and an afterlife "which clearly described the major elements and sequences of NDEs" (p. 83). These reports of hashish-induced NDEs are "more strikingly similar to non-drug-induced experiences than was previously noted in a discussion of drug-induced NDEs (Siegel, 1980)."

Ethnobotany

Perhaps the most exciting new development in this area is the planned publication of a new series by Yale University Press on "Psychoactive Plants of the World" under the editorship of Richard Schultes and Robert Raffauf. Tentatively planned are books on ayahuasca, kava, coca, caffeine, khat, fungi and one on the art and artifacts of psychoactive plant use. The synthesizing of the ethnobotanical literature on psychoactive plants in one comprehensive series allows for a more detailed and deepened understanding of the role these substances have played in human life and culture. The first book in the series has been published:

*synthesizing
of the
ethnobotanical
literature*

WILBERTJ. (1987). *Tobacco and shamanism in South America*. New Haven, CT: Yale University Press.

Tobacco is the main sacred plant for many indigenous cultures in the Western Hemisphere. Its use has spread throughout the world and is perhaps the only psychoactive plant available in every community on earth. The author explores tobacco as a tool for inducing shamanic trance and visionary states and postulates an ethnopharmacological explanation for the shaman's report of paranormal vision: "nicotine ablyopia-altered optic scotoma"; and for the magical power of "seeing": "nicotine narcosis" which literally changes the way the shaman sees the world.

McKENNA, D. (1989). It's a jungle out there: Biochemical conflict and cooperation in the ecosphere. *Whole Earth Review*. 64. 40-47.

Alleochemicals are made by organisms to influence the growth, behavior, health, or population biology of other organisms. The author reviews the complex eco-chemical relationships developed by *plants* which, needing to compete with other plants, avoid being eaten by insects and other animals and needing help with pollination and seed dispersal, have relied on biosynthesis to mediate their relations with the world. While many plant alleochemicals are valued for their effects on the nervous system, that effect may be incidental to the plant. They may have originally evolved as poisons to the nervous systems of insects or herbivores. While recognizing the unlikelihood of obtaining definitive answers about their impact on human evolution, D. McKenna draws upon his field research in the Amazon and other sources to speculate about what effect the presence of psychoactive alkaloids in the diet of early hominids might have had on the evolution of the nervous system: "Alleochemicals in plants have existed far longer than humanity. . . and they have undoubtedly played an important, if unrecognized, role in human-plant co-evolution" (p. 47).

Archaeopsychopharmacology

*iconographic
and
textual
analyses*

This research methodology relies upon iconographic and textual analyses of ancient artifacts. The many new findings in this area during the past ten years derive mainly from new interpretive methods applied to extant artifacts rather than from the discovery of additional sites and artifacts. Wasson is usually credited with pioneering this approach, which he originally termed ethnomycology in 1968 when he proposed the *Amanita muscaria* mushroom as the magical Vedic potion *Soma*. After additionally positing that an LSD-like ergot was involved in the Eleusinian mysteries and, therefore played an influential role in the formation of early Western philosophy (Wasson, Hofmann & Ruck, 1978), Wasson and colleagues (Kamrisch, Ott, Ruck & Wasson, 1986) postulated that psychedelic mushrooms were responsible for the origins of religion. This idea has not been universally accepted. One critic of this theory is Naranjo (1990) who disputes such a pivotal role for psychedelics in the earliest religious experiences: "mysticism has existed at all times independently of plant use" (p. 180). Yet he goes on to support the proposition that "psychedelics. . . contributed much to the early *diffusion* of religious experience and played a part in the origin of religious *movements*" (p. 180).

Archaeopsychopharmacological research has revealed a long history of human involvement with psychoactive plants. Neanderthal burial sites from 60,000 B.C. contain pollen clusters of many plants with psychoactive properties (Schultes, 1989). Petroglyphs in North Africa indicate the existence of

psychedelic mushroom cults more than 12,000 years ago and the use of plants to induce ASC has been documented to circa 8,000 B.C. (Furst, 1976). Mandell (1979) commented that, "The Smithsonian's future museum for anthropological artifacts useful in showing what culture was like back then may well look like a pharmacy" (p, 73). Since Wasson's pioneering research, and particularly in the 1980s, there has been a major expansion in understanding the central role which hallucinogens have played in shaping many areas of life in prehistoric societies, especially their religious life. Below are listed some examples of archaeopsychopharmacological research.

STAHL, P. (1989). Identification of hallucinatory themes in the Late Neolithic art of Hungary. *Journal of Psychoactive Drugs*, 21(1), 101-12.

Prior interpretations of the Venus figurines of the Late Neolithic culture (6000 B.C.) in Europe have viewed them in the context of fertility cults connected with the Great Mother Goddess. The author compared the images and motifs from the Venus figurines with designs from contemporary and historical cultures where hallucinogenic drug use played a role in ecstatic religion. Based on numerous parallels, the author proposes a new interpretation, that there was a hallucinogenic genesis for much of the artistic content of these Neolithic artifacts: "Analysis of these Late Neolithic artifacts indicates the presence of a number of themes associated with hallucinogen use: the presence of iconographic elements similar to eidetic forms; the use of red color; anthropo- and theriomorphic figurines in seated postures; and specific pattern of breakage with disposal" (p, 101).

TORRES, C. (1987), *The iconography of South American snuff trays and related paraphernalia* (Etnologiska Studier 37). Goteborg, Sweden: Goteborgs Etnografiska Museum.

This is a comprehensive survey of South American snuffing paraphernalia and an analysis of its iconography based upon six years of archaeological investigation. Although these trays have been interpreted as offering tablets, as receptacles for blood, as palettes, and as recipients for lime powder, observation of the use of similar trays by contemporary native groups of the Amazon Basin indicates that these objects were used in the snuffing of psychoactive substances (particularly DMT-containing plants and tobacco). The first description of snuffing practices in the Americas, which were observed during religious ceremonies, was written by Christopher Columbus, although artifacts have been dated back to 1200 B.C. Torres notes that, "the use of a tray and a tube as part of the paraphernalia for the inhalation of narcotic powders is a trait which seems to be restricted to South America" (p, 1). Based upon the iconography and distribution of archaeological artifacts, the author concludes, "the practice of snuffing originated in the Amazon Basin, but the use of a tray to deposit the powder for its inhalation may have occurred first in the Peruvian coast" (p, 102).

EMBODEN, W. (1989). The sacred journey in dynastic Egypt: Shamanistic trance in the context of the narcotic water lily and the mandrake. *Journal of Psychoactive Drugs*, 2J(1), 61-75.

Most of the sacred ritual trance states portrayed in ancient stelae, magical papyri and on vessels have been seen as funeral scenes of mourning, with the plants portrayed as offerings. "The present article revises this notion. Based on an extensive review of these two powerful narcotic (i.e., hypnotic) plants in iconography and ritual, it is argued that the dynastic Egyptians had developed a form of shamanistic trance induced by these two plants and used it in medicine as well as healing rituals" (p. 61). The author argues that these artifacts reveal a profound knowledge of plant lore and altered states of consciousness, and that the constituents of these plants provide the requisites of shamanistic trance: "derangement of the priest-shaman's equilibrium that separates the sacred from the profane, and the soul from the body" (p. 75).

DOBKIN DE RIGGS, M. (1982). Plant hallucinogens, sexuality and shamanism in the ceramic art of ancient Peru. *Journal of Psychoactive Drugs*, 14(1-2), 81-90.

While the ceramic art of the ancient Mochica and Nazca peoples, who lived on the desert coast of Peru from 100-800 A.D., had been subjected to previous analyses, "none of them has focused on the role of plant hallucinogens in influencing their expression" (p. 81). The author drew upon the findings of her previous study (Dobkin de Rios, 1976) where she surveyed twelve societies in which hallucinogens had been used: "A series of drug-linked themes or motifs emerged from this study which serve as working hypotheses to test against the art of now extinct peoples" (p. 89). Based on comparisons to these motifs, the author concluded that in the ceramic art of the Mochica and Nazca peoples, "Shamanic themes linked to hallucinogenics can be demonstrated, based on their world-wide recurrence in societies where plant hallucinogens were used and displayed in the plastic arts" (p. 85).

FLATTJURY, D. & SCHWARTZ, M. (1989). *Haoma and harmaline: The botanical identity of the Indo-Iranian sacred hallucinogen (Soma) and its legacy in religion, language and Middle Eastern folklore* (Near Eastern Studies, Vol. 21). Berkeley, CA: UC Berkeley Press.

This study attempts a thorough revisioning of all arguments and textual material relating to the botanical identity of Soma. The authors discuss the role of psychoactive substance-induced ecstasy in Iranian religion and utilize literary material from the sacred book of the Zoroastrian religion, the *Avesta*. This book predates the Vedic literature which Wasson relied upon for his theory of the *Amanita muscaria* mushroom as the basis of Soma. They propose that *Peganum harmala* (giant Syrian Rue) meets all the criteria for Soma: the characteristics of the plant, the rituals used in its preparation, the state of *intoxication*, and its psychopharmacology. The authors note that the first reference to Soma in a Western language, in 1794, also translated it as giant Syrian Rue.

McKENNA, T. (1988). Hallucinogenic mushrooms and evolution. *Revision*, 10(4), 51-57.

A wide range of evidence is adduced to support the theory that plant hallucinogens are central to the origin of mind, "This hidden factor in the evolution of human beings, the factor that called human consciousness forth from a bipedal ape with binocular vision, involved a feedback loop with plant hallucinogens" (p. 52). Specifically, "in the presence of hallucinogens, a culture is slowly introduced to increasingly more novel information, sensory input, and behavior and thus is bootstrapped to higher states of reflection" (p. 52). Thus hallucinogenic plants "catalyze consciousness" and are responsible for the development of all the mental functions that we associate with humanness including recall, projective imagination, language, magical speech, dance and sense of the *religio* which distinguish us from other primates.

Qualitative Interview

WALSH, R. (1982). Psychedelics and psychological well-being. *Journal of Humanistic Psychology*. 22(3), 22-32.

To investigate the experiences and long-term impact of psychedelic drugs, the author employed Maslow's (1971) strategy of interviewing individuals who are exceptionally healthy. He selected five persons, all of whom had published extensively in their fields and had strong national reputations, and conducted intensive interviews with them. They reported that their psychedelic experiences had led them to an increased interest in depth psychology, religion, spirituality, consciousness and meditation. "All five felt that, for psychologically mature individuals, the psychedelics, while not constituting a path to deep awakening by themselves, could facilitate psychological growth when used in the context of an ongoing discipline" (p. 22). Walsh also found that, "On average, they continued to use psychedelics approximately one or two times per year" (p. 25),

RING, K. (1988), Paradise is paradise: Reflections on psychedelic drugs, mystical experiences and the near-death experience. *Journal of Near-Death Studies*, 6(3), 138-48,

To investigate the relationship between Near Death Experience and psychedelic drugs, the author interviewed a man whose "account of an experience, induced by a combination of LSD and hashish ... reproduces *all* the essential features of an NDE" (p. 144). Based on this interview and a literature review, Ring concluded: "We are left, then, with the sense that although psychedelics in themselves cannot be used *in lieu of* "spiritual path, they can precipitate a spiritual awakening, akin to a mystical experience or NDE" (p. 147).

BECK, J., (1990). *The MDMA controversy: Contexts of use and social control*. Unpublished doctoral dissertation, University of California, Berkeley. Also published as: Beck, J., Harlow, D. McDonnell,

D., Morgan, P., Rosenbaum, M. & Watson, L. (1989). *Exploring ecstasy: A description of MDMA users*. Final report to the National Institute on Drug Abuse, Grant No. I ROJ DA04408.

This is the only federally-funded sociological study of MDMA users. It assessed drug use patterns among groups not usually characterized as "deviant" drug users, such as middle class professionals and "New Agers." Ethnographic fieldwork methods were used to investigate a broad cross-section of MDMA users in the nightclub scene in Dallas and at Grateful Dead concerts. Semi-structured interviews with 100 users were also conducted to obtain information about usage patterns, motivations, subjective effects and long-term effects. The study was the first to identify a small segment of the user population which were frequent or binge users. It found a continuum from a recreational orientation to a therapeutic/spiritual orientation, with many following in between these two poles. Most users, while very positive about initial MDMA experiences, generally cited various problems associated with continued use which tempered their enthusiasm for MDMA" (p. 200). Thus only 19% reported using it *more* than one time per month in the past year.

Literary Description

*to
study
the
imagination
with
imagination*

From the human science perspective, literature provides a special form of discourse for studying human experience and behavior (Polkinghorne, 1983). It is the attempt to study the imagination with the imagination. Much attention has been devoted to the role which story plays in human understanding (Polkinghorne, 1988; Sarbin, 1986). Or as stated more colloquially by Ken Kesey: "We're up to our noses in facts. We want Story ... we need Story" (Russell, 1987, p. 26).

McKENNAT. (1990). Wasson's literary precursors. In T. Reidlinger [Ed.], *The sacred mushroom seeker: Essays for R. Gordon Wasson*. Portland, OR: Dioscorides Press.

A historical review of the fictional and scientific literature has uncovered that the first investigations of psychoactive mushrooms were published "by disguising it as literary fiction" (p. 166). The works of H. G. Wells, Lewis Carroll and John Uri Lloyd are analyzed for signs of personal experience with psychoactive mushrooms. The case for Lewis Carroll is not clear; for Wells it is described as "compelling," but in the case of John Uri Lloyd, McKenna cites passages which "are more than sufficient to convince the open-minded reader that John Uri Lloyd, 19th Century savant, pharmacist, occultist and author had discovered the consciousness-expanding properties of psilocybin mushrooms, experienced them, and then decided to suppress his discovery" (p. 171).

Contemporary fantasy/science novels also present vivid descriptions of psychoactive substance use. Leavitt (1981) has

provided a rationale for the utilization of this genre to explore psychoactive substance experiences: "Because science fiction is bounded only by the constraint of what could be, it is able to examine everything-and what better to examine than that which is doing the examining itself: human consciousness?"(p. 395).

LEGUINN, U. (1984). *Always coming home*. New York: Bantam.

This utopian visionary novel of the Valley people presents the life story of a woman, Stone Telling. The mythology, poetry rituals and songs of this people are all described along with the "medical practices" of the "singing doctor" whose pharmacopeia includes "trance-inducing drugs." While hallucinogenic drugs are not the centerpiece of this culture, among some of the cults, they play a role in one of the major ceremonies, The Sun Dance.

Castaneda can be credited with developing a genre of fiction based on a participant observer stance toward experiences with psychoactive substances and encounters with sorcerers (de Mille, 1976). This approach allows him to discuss serious transpersonal issues allegorically, although the pharmacological accuracy and authenticity of Castaneda's accounts of experiences with psychoactive substances has been questioned (Siegel, 1981). This literary form has been adopted by others more recently, such as Lynn Andrews, whose ethnographic integrity has also been questioned. Books such as these, which are best sellers, communicate aspects of psychoactive substance experiences to the general public, most of whom would not otherwise encounter more accurate anthropological literature.

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ANDREWS, L. (1985). *Jaguar woman and the wisdom of the butterfly tree*. San Francisco: Harper & Row.

This is the third of the continuing series of adventures of the author's apprenticeship with Native American medicine woman, Agnes Whistling Elk. At the finale of the book, there is confrontation between Jaguar Woman and Andrew's arch-enemy, Red Dog, in which he is challenged to partake in a mushroom ceremony. The members of the Sisterhood of the Shields use the psychedelic state to create visual hallucinations in which Red Dog and his gang are tricked into believing that they are copulating with the women while they are actually whisking the sacred mask away from the men.

There are also borderline cases midway between science and literature. In contrast to Castaneda's subsequent six books, his first book, which was his dissertation in anthropology at UCLA, may have been an example of a mixture of "fact" and fiction. However, it's impossible to determine the factuality of most of his reports (de Mille 1976, 1980; Shelburne, 1987). A recent example is:

VILLOLDO, A. & JENDIRSEN, E. (1990). *A shaman's odyssey into the Amazon*. San Francisco: Harper Collins.

This is an account of fifteen years that Villoldo, a psychologist, spent as a disciple of the Peruvian shaman Don Jicaram (a pseudonym). One reviewer stated, "the narrative has the feel of an Indiana Jones thriller" (Shore, 1990). This book is presented as a non-fictional account, yet the involvement of a playwright and screenwriter as co-author raises the question: How much of the rich phenomenological account is the creation of a professional fiction writer?

Although this review is limited to printed material, it is worth noting that movies, such as *Emerald Forest*, and popular music by groups such as Camper Van Beethoven, have also examined transpersonal experiences induced by psychoactive substances.

Autobiographical Accounts

*self-reports
of
experiences* Self-reports of experiences with psychoactive substances add phenomenological depth to the neurological and psychological research. Many such accounts were published in books, journals and periodicals during the heydays of the '60s. However, this avenue of investigation was given much less attention in the 1980s.

ADAMSON, S. (1985). *Through the gateway of the heart: Accounts of experiences with MDMA and other empathogenic substances*. San Francisco: Four Tree Publications.

This book presents a series of about fifty brief, subjective accounts of experiences with psychoactive substances, mainly MDMA. Although the passages are contributed anonymously, the age and sex of the writer as well as set, setting and dosage are given for each passage. One reviewer noted, that after first being struck by a sense of *deja vu* related to reading earlier accounts of LSD and mescaline experiences, he found that, "There is more continuity to what is retained from the [MDMA] drug experience than previous anecdotal psychedelic accounts. If there is an underlying theme to the present material, it is a figurative and emotional sense of letting go, of relaxing into a chronic receptivity rather than plunging into a Michauxesque 'retinal circus'" (Seymour, 1987, p. 399),

PALMER, C. & HOROWITZ, M. (1982). *Shaman woman! Mainline lady: Women's writings on the drug experience*. NY: William Morrow.

The published anthologies of drug experiences have been dominated by accounts written by men. This is the first collection presenting women's writings on their experiences with psychoactive drugs. Accounts range from the first memoirs and poems of opium users in the early nineteenth century to *selections* encompassing the psychedelic and post-psychedelic eras. Much of the literature was discovered

in long out-of-print books and obscure periodicals. The writers, from a wide variety of backgrounds, ingest an array of psychoactive substances in diverse settings to provide a feminine perspective on the drug experience.

LUKOFF, D. (1990). Shamanistic initiatory crisis. *Shaman's Drum*. In press.

The author recounts his psychotic episode which was triggered by ingesting LSD and then compares it to the shamanic initiatory crisis of the Siberian shaman Kyzalov which also involved psychotic symptoms. Lukoff describes his experience of becoming Christ and Buddha and writing a "new Bible." After re-entering consensus reality, he spent several years studying with shamans to help integrate this experience. There were parallels between his experience and those of the shaman Kyzalov's initiatory crisis in three respects. First, shamans and their practices were involved in the integration of both Kyzalov's and the author's crises. Second, both Kyzalov's path to becoming a shaman and his to becoming a clinical psychologist were initiated by psychotic episodes. Third, the two experiences shared many themes and images. The anthropologist Ruth-Inge Heinz noted that the term "shamanistic" should be used for shaman-like activities, e.g., activities which may be carried out by somebody other than a shaman. Thus the designation of shamanistic initiatory crisis aptly describes the author's and others' similar experiences and suggests a role for the neo-shamanic movement in the treatment of psychotic episodes, especially those triggered by ingestion of psychedelic substances.

Action Research

Action research is more of a paradigm than a specific method. This approach acknowledges that the quest for objective truth, or even understanding, is not the major concern: "Action research is explicitly geared toward improvement of an unsatisfactory situation. Its main character, however, is the involvement of "practitioners" in research processes that concern their own affairs ... [and] turning research itself into a transformative activity" (Tesch, 1990, p, 66). The British educators who developed this approach trained teachers to conduct their own research instead of leaving it for ivory-tower academicians to do. They considered it a practical application of the idea of a "critical social science" as described by Martin Heidegger, since it empowers those who are the research targets. This mode of conducting research describes an aspect of the research on psychoactive substances that is fairly unique—namely the extensive network of lay researchers (many using pseudonyms such as R. U. Sirius, Queen Mu, Gracie and Zarkov) who publish in a wide array of non-academic periodicals and monographs. Topics stray off the merely academic to range from the practical, such as a report

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on recent developments in "Smart drugs" (in *Mondo 2000*), to technical articles on "optimum harvesting and storage techniques [for psilocybin mushrooms] .. , varying forms of dehydration for optimum psychoactivity," to interviews with key figures involved with psychoactive substances, e.g, William Burroughs (the latter two articles are both in *Psychedelic Monographs and Essays*). In action research, information is considered "valid" if it "generates increasingly intelligent self-corrective action" (Barrell, Aanstoos, Richards & Arons, 1987, p, 475). Hence the concern by many non-professionals with issues ranging from the technical to the spiritual, all of which are important to understanding psychoactive substances/ transpersonal states relationships.

Joan Halifax, a medical anthropologist and editor of a book of shamanic narratives, which includes a section on "Wondrous Medicine" experiences (Halifax, 1979), described this type of committed action research orientation among R. Gordon Wasson's circle of colleagues:

This relationship was to become a kind of conspiracy shared by a fascinating network of individuals-young and old, scholar and student, shaman and mystic, . . . All of us were on the track of the mystery, aware that the mushroom had hidden itself from the Western researcher, historian, anthropologist and archeologist, and also that it was a key to understanding the traditions of various old shamanic cultures. Moreover, many of us, .. ourselves had also tasted of this mystery and felt a commitment to bringing it to light" (Halifax, 1990, p, 112),

Heuristic Method

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In heuristic research, personal considerations are deliberately encouraged as part of the research process. "To immerse oneself in one's own experience and that of others is the hallmark of heuristic research" (Tesch, 1990, p, 70). Moustakas (1990) has recently articulated this method and provides a vivid example of this approach in his book, *Loneliness (1961)*, written following the serious illness of his daughter. As part of the research, he engaged in meditation, self-inquiry, "mystical reachings," a literature review, interviewing and the observation of hospitalized children. The focus in heuristic research is on re-creation of the lived experience utilizing full and complete depictions of the experience from the frame of reference of the experiencing person. Interviews, narrative descriptions, stories, poems, artwork, journals and diaries, autobiographical logs, and other personal documents are all "data,"

Many researchers of psychoactive substances qualify as examples of this methodology. In *The marriage of the sun and moon: A quest for unity in consciousness*, Andrew Weil (1980) discusses his search to understand his own psychedelic experiences. Another contemporary heuristic researcher is Terence McKenna, an author and speaker about hallucinogenic drugs, whose work represents this quality of deep personal immersion with the experience. His quest began after ingesting DMT, a synthesized form of a natural plant compound which brings on a short but intense hallucinogenic experience. "I said, 'This isn't a drug, this is *magic!* This is a dimension to reality that most people never even suppose exists ... raising all kinds of issues about what is reality, what is language, what is the self, what is three-dimensional space and time, all the questions I became involved with over the 20 years or so'" (Levin, 1988, p. 17).

Following this conversion experience, McKenna, who started college at UC Berkeley as an art history major, began his research by travelling to Nepal because he saw some correspondences between his imagery during psychedelic sessions and Tibetan art. This led him to study with Tibetan shamans who were still actively involved with psychoactive substances, and then to the Amazon for further research on "botanical shamanism." Despite formal training limited to a bachelor's degree, McKenna combines knowledge of neurochemistry, ethnobotany, anthropology, history, linguistics, transpersonal psychology and chaos theory in his work. He has self-experimented with virtually every form of psychedelic substance, engaged in introspection and self-reflection, dialogued with others about their experiences, and read extensively in the neurochemical, ethnopsychopharmacological and art history literature. In the span covered in this review, he has contributed to the archaeopsychopharmacology and ethnobotanical research as well as publishing an investigation of literary description of mushroom experiences (abstracted above). Together with co-researcher "and" wife, Kathleen, he also founded Botanical Dimensions, an organization dedicated to collecting living ethnomedicinal plants from around the world and their associated lore.

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As McKenna's research career illustrates, the heuristic method is inherently cross-disciplinary, but the research is always brought back to bear on the researcher's own experience. In his attempt to "define the self in the hallucinogenic dimension" (McKenna, 1990, p. 203) McKenna has particularly focused on the psilocybin mushroom (he co-wrote with his brother, Dennis, a grower's guide which sold 100,000 copies) and the Amazonian hallucinogenic plant brew ayahuasca,

McKENNA, T. (1990). Among the Ayahuasquera. In C. Ratsch (Ed.), *Gateway to inner space* (pp. 179-212). Dorset, Great Britain: Prism Press.

The author undertook two field trips to the Amazonian basin to work with ayahuasceros and to obtain samples of their preparations as well as to collect specimens of regional psychoactive plants. These expeditions contributed to the understanding of the pharmacokinetics of ayahuasca. Based on subsequent analysis of the psychoactive alkaloids involved and reflection on his experiences with "botanical shamanism," he concluded: "The shamaaic curing context is perhaps not the ideal context for determining the parameters of any hallucinogen" (p. 208). "It maybe that possession of pure chemicals in combination with collected living plants and the collected available data of ethnography put one in a better position to gain an overall sense of the importance of psychedelic visions than can be gotten from any particular informant, limited necessarily by adaptation to a single approach." (p. 193).

Music

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By their own report, psychedelic drugs have influenced the music and lives of many rock performers, although an interview study (Krippner, 1970) found that very few created or performed during psychedelic sessions. The genre of music known as acid rock, which sprang up around the use of psychedelic drugs, has some unique qualities which have only recently been investigated.

BAUMEISTER, R. (1984). Acid rock: A critical reappraisal and psychological commentary. *Journal of Psychoactive Drugs*, 16(4), 339-45.

The author evaluated acid rock music from the Grateful Dead, Jefferson Airplane and Beatles in terms of sound, structure, emotion, and lyrics. He observed that the style was quite variable because a major thrust in the music was to discard familiar conventions. However, the result was an openness to use a wide spectrum of instruments and sound effects which has continued into contemporary popular music. He also suggests that the psychedelic drugs created mental states with certain preferences and receptivities which, in turn, influenced the music to assume features which correspond to these mental states. In particular, the themes of "emotional ambiguity," "interest in novel sensations" and the "impatiently creative desire to explore complex and subtle elaborations" were identified.

Historical Research

STEVENS, J. (1987). *Storming heaven: LSD and the American dream*. New York: Harper and Row.

While this account provides an overview of the psychedelic movement in the U.S., it is particularly comprehensive in its coverage of the psychotherapeutic experiments with LSD in the 1950s and 1960s.

LEII, M. & SHALIN, B. (1985). *Acid dreams: The CIA, LSD and the sixties rebellion*. New York: Grove Press.

Based upon research into previously classified materials, the authors trace the CIA's infatuation with LSD as a method to modify an individual's behavior by covert means and the military's involvement with psychedelic drug research. Then it moves to detailing a social history of the "counter-culture," covering key figures and events which shaped the 1960s.

LYTTLE, T. (1988) Drug based religions and contemporary drug taking. *Journal of Drug Issues*. 18(2), 271-84.

Based upon previous research and the various religious groups' own published materials, this study of contemporary drug-using religious groups divides such organizations into two types: 1) deterministic; iconic groups which incorporate a body of theology and ritual to guide drug taking and with which adherents are expected to comply; 2) situational groups which promote the use of drugs usually in uncontrolled and unsupervised settings with little or no associated ritual. The Native American Church, with its incorporation of Christian theology and a very formal ritual structure for the taking of peyote, is the most well known deterministic/iconic organization. It has spawned numerous offshoots or imitators which are more open to participation by non-Indians, e.g., The Peyote Way Church, The True Inner Light Temple. The Nco-American Church, which advocated a doctrine of "solipsistic nihilism" and claimed a membership of 10,000 members at its peak, is an example of a situational drug-based church. The Church of the Sunshine also advocates using illegal drugs according to personal religious inspiration, personal ethics or other situational concerns. No formal rituals are associated with either of these two groups. The author indicates that many similar groups of both types are active but have eschewed publicity.

Naturalistic Research

SIEGEL, R. (1989). *Intoxication: Life in pursuit of artificial paradise*. New York: Dutton.

The author reviews and provides extensive references to the research, some of which he conducted, on the drug-seeking and using behavior of animals in natural habitats and also in laboratories. After reviewing the intentional use of hallucinogenic and other psychoactive plants as well as of alcohol, Siegel concludes that, "Intoxication with plant drugs and other psychoactive substances has occurred in almost every species throughout history" (p. 210). He then proposes that early hunter; gatherer groups learned to identify and use psychoactive substances by observing and imitating the use of plant substances by

animals. He also postulates that intoxication is the fourth human drive, after hunger, thirst and sex, and that "Intoxication ... has adaptive evolutionary value" (p, 211).

Adverse Effects

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By examining their relationship to transpersonal states, this review has tended to focus on the positive side of psychoactive substance use. Yet a comprehensive view of psychoactive substances must also include the findings on risks of addiction and adverse reactions (Hayner & McKinney, 1986; Smith & Seymour, 1985; Strassman, 1984). In addition, although the use of psychoactive substances by indigenous peoples is often portrayed as adaptive and therapeutic, these substances are also used to promote aggression (e.g., DMT snuffs among the Yanomamo Indian warriors) and as means of social control (e.g., among the Mochica where "Shamanic leaders depended mightily on hallucinogenic brews as a way of consolidating their political and psychological powers" [Dobkin de Rios, 1982, p, 89]). Thus, despite their potential value in research and psychotherapy, usage of psychoactive substances must always be viewed as carrying some degree of risk, and they cannot be separated from the values and expectations of the cultural context in which they are employed.

Conclusion

Despite the relative ban on research with psychoactive substances and human subjects during the 1980s, research on their medical and psychotherapeutic applications has continued, albeit sporadically. This decade has also seen the re-opening of research on psychoactive substance-assisted psychotherapy in Switzerland. When research with psychedelic drugs was stopped in the 1960s, it was not then possible to establish the efficacy of any form of psychotherapy to everyone's satisfaction. In the 1980s, there has been an increased clarification of the methodological problems in establishing the efficacy of psychotherapy assisted by psychoactive substances. With the new psychotherapy outcome methodologies now available, it should be possible, once research resumes on a larger scale, to resolve the question of whether psychoactive substance-assisted psychotherapy is indeed effective, and if so, whether it is any more effective than non-drug therapies. A further unresolved question is whether the occurrence of a peak or mystical experience during psychoactive substance-assisted psychotherapy is predictive of positive psychotherapeutic outcome.

Also in this decade, there has been a search for final common neurochemical pathways involved in both drug-induced and non-drug related transpersonal states. Quantitative psychological research with psychoactive substances on topics in consciousness such as imagery, cognition, fantasy and mind-brain relationships has been severely hampered by governmental restrictions; few studies were published in the 1980s. However, human sciences research, particularly in the area of archaeopsychopharmacology, has resulted in a dramatic increase in our understanding of the role which psychoactive substances have played in the religious life of the earliest human societies and civilizations. In addition, ethnographic and ethnopsychopharmacological research in the 1980s has demonstrated that the use of psychoactive substances by indigenous peoples is far more widespread than previously recognized by mainstream anthropologists. Many of these studies have led to an increased understanding of shamanism as an organizing mythological context for the sacred and ritual use of psychoactive substances to induce transpersonal states.

One could see the state of affairs of research on psychoactive substances and transpersonal states as chaotic: too many different fields bringing their disparate ways of looking at these questions but no single line of investigation yielding "the answer." However, any comprehensive understanding of the relationship between psychoactive substances and transpersonal states requires an integration of the perspectives from a wide range of disciplines, each with their respective methodological approaches.

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Transpersonal psychology is a sub-field or school of psychology that integrates the spiritual and transcendent aspects of the human experience with the framework of modern psychology. It is also possible to define it as a "spiritual psychology". The transpersonal is defined as "experiences in which the sense of identity or self extends beyond (trans) the individual or personal to encompass wider aspects of humankind, life, psyche or cosmos". It has also been defined as "development beyond conventional