

NOTES ON CONTRIBUTORS

George ANDREWS is an American poet and writer residing in Tangiers. . . . Gottfried BENN, poet and M.D., is described in the introduction to his essay. . . . Ralph METZNER is at present an NIMH postdoctoral research fellow in psychopharmacology at Harvard University. . . . R. Gordon WASSON is Partner of Morgan Guaranty Trust Company, Research Fellow at the Botanical Museum of Harvard University, and one of the world's leading experts on mycology. He is the author, with Valentina P. Wasson, of *Mushrooms, Russia and History*, and with Roger Heim of *Les Champignons Hallucinogènes du Mexique*. . . . Alan WATTS, philosopher and specialist in Far Eastern philosophy, is currently engaged in research at Harvard on problems of human identity. He is the author of many books, including *The Joyous Cosmology*, *The Way of Zen*, and *Psychotherapy East and West*. . . . Gerald HEARD, noted religious philosopher and scientific interpreter, is a prolific writer, and has recently completed a manuscript on the uses of LSD. He is author of the forthcoming *Five Ages of Man*.

ALAN WATTS

America's most adventurous philosopher describes his own experiences, ranging from the diabolic to the divine, with the "mystic drugs"—LSD-25, mescaline, and the mushroom derivatives



THE JOYOUS COSMOLOGY

Adventures in the Chemistry of Consciousness

By **ALAN W. WATTS** Foreword by Timothy Leary and Richard Alpert, Center for Research in Personality, Harvard University. Illustrated, \$5.00, now at your bookstore.

PANTHEON

The Psychedelic Review

Vol. I Fall 1963 No. 2

Contents

EDITORIAL	118
PSYCHOSIS: "EXPERIMENTAL" AND REAL	<i>Joe K. Adams</i> 121
BOTANICAL SOURCES OF THE NEW WORLD NARCOTICS	<i>Richard Evans Schultes</i> 145
HERMANN HESSE: POET OF THE INTERIOR JOURNEY	<i>Timothy Leary & Ralph Metzner</i> 167
PSYCHOMETABOLISM	<i>Sir Julian Huxley</i> 183
THE TREATMENT OF ALCOHOLISM WITH PSYCHEDELIC DRUGS	<i>The Editors</i> 205
SOME COMMENTS CONCERNING DOSAGE LEVELS OF PSYCHEDELIC COMPOUNDS FOR PSYCHOTHERAPEUTIC EXPERIENCES	<i>Gary M. Fisher</i> 208
FOUR PSILOCYBIN EXPERIENCES	<i>Frederick Swain, et al.</i> 219
THE GOD IN THE FLOWERPOT	<i>Mary Barnard</i> 244
BOOK REVIEWS	252
STATEMENT OF PURPOSE	259
CONTRIBUTORS	260

EDITORIAL

This second issue of *The Psychedelic Review* marks a major change in organization and policy. The journal is no longer published or sponsored by the International Federation for Internal Freedom. The leaders of that organization, Dr. Timothy Leary and Dr. Richard Alpert, do not continue as members of the *Review's* Board of Editors, and no continuing members of the Board are members of IFIF. The point of this sharp separation is to avoid the identification of *The Psychedelic Review* with any single socio-ideological group or perspective. Amid the controversy — scientific, philosophical, legal — that rages around psychedelics, the *Review* seeks to be an independent, non-partisan voice.

In the United States there are at present three major groups interested in psychedelic substances and experiences. Each has its own set of models and prescriptions; each uses its own terminology; each has firm ideas about what psychedelic substances are, and how and by whom they should be used.

The first group, historically and in terms of size, is composed of pharmacologists and research psychologists and psychiatrists. They tend to refer to these substances as "psychotomimetic" — producing "model psychoses" — and recommend that they be used only to investigate pathological states of mind or to locate biochemical factors in psychosis. Whether or not they are influenced by the extent to which their research has revolved around psychosis, this group is the most apprehensive of the havoc these drugs can wreak. A recent article in the *Archives of General Psychiatry* (May, 1963) by Cohen and Ditman, and an editorial in the *Journal of the American Medical Association* (September 14, 1963) by

Farnsworth, are representative statements. This group advocates strict methodological control in experiments and strict social control over use.

The second group, which for want of a better name may be referred to as the "artistic" group, consists of artists, writers, painters, musicians, and young bohemians. They adopt a generally rebellious attitude toward established forms of artistic and social expression. Representative statements are McClure's *Meat Science Essays* and the *Journal for the Protection of All Beings* (both City Lights Books, San Francisco). In keeping with a tradition going back at least as far as Baudelaire and De Quincey, drugs are used to induce trances and visions, to enhance sensibility and creativity, or simply to enlarge awareness. Marijuana and peyote have long been used by them; they have recently turned to LSD and other synthetic psychedelics.

The third group consists of psychologists, philosophers, psychiatrists, theologians, and others who have become interested in the use of these drugs to help induce experiences which transcend ordinary space-time, conceptual, and ego-oriented categories. They tend to view prevailing medical and psychological research models as overly-restrictive and suggest the exploration and application of psychedelic experiences within frameworks which are educational, religious, or scientific in a broader-than-usual sense. Many members of the International Federation for Internal Freedom fall into this group, but the two are far from co-extensive: some voices in IFIF sound more like those in the artistic group, and many in group three have never been connected with IFIF. Aldous Huxley and Gerald Heard may be taken as representative. (See Heard's "Can This Drug Enlarge Man's Mind?" in our preceding issue.) Most of those in this category stress the importance of expectation and setting in influencing the character of the drug experience. Their preoccupation with the internal state of the person undergoing the drug experience reflects a disaffection with approaches that are primarily behavioristic. They also tend to advocate disciplined preparation and follow-up.

Of the three groups, the first is currently the strongest, and legal authorities, charged with the drugs, generally and understandably reflect their attitude. The second group serves as the "loyal opposition"; its self-styled role of rebel allows it the freedom to express radical and unusual points of view. It would be tidy to

think of the third group as representing a synthesis of the other two, but this undoubtedly would be an oversimplification. The three-way debate is likely to become more complex before it becomes less so.

In the charged and confusing realm which is that of the psychedelic substances as they now stand, *The Psychedelic Review* proposes to serve as a forum for information, expression, and exchange, printing significant reports from each of the three groups now on the scene and others as they may appear. On no topic so fraught with weal and woe are convictions and thought currently in such disarray: on no other subject does one hear from intelligent men who are trying to be responsible such contrary claims and opinions backed by conviction so deep that it can be described only as passion. To lead us out of this corporate confusion, we have only the age-old tools of reason, experience, and experiment. Their reports need to be focused, and there is no other organ dedicated to this end.

Hence *The Psychedelic Review*. It seeks your subscription, your advice, your manuscripts, your contributions toward meeting its mounting debt, and (not least) your patience. For all save the latter, write Box 223, Cambridge, Mass. 02138.

PSYCHOSIS: "Experimental" and Real

—*Now is there something wrong with this entire circus.*

CARL GIESE

—*Consistency, thou art a jewel.*

Origin unknown

JOE K. ADAMS¹

I SHALL ATTEMPT to present a theory of psychosis centered around the topics of cognitive structure, emotion, role, cultural norms, and communication, and to relate my theory to the cultural revolution through which we are now passing, with comparative references to past revolutions. The contribution of the psychedelic drugs in understanding both "psychotic" and "normal" behavior will be described according to this author's convictions, which have much in common with those focused on "transcendental" experiences, but also with those which have placed drug experiences and behavior in the "model psychosis" context. The presentation is necessarily sketchy, because psychosis involves many problems interlocked in such a way that they must be solved simultaneously rather than piecemeal, in any reasonably adequate theory. Many readers, however, have doubtless been thinking along similar lines and will have little difficulty in filling in most of the gaps.

It is assumed that the reader is familiar with the idea that the processes of socialization result in the individual's perception of some objects and events as they in fact are, and of some objects and events as they in fact are not.² No animal can survive without some validity in his perceptions, but no animal has only valid perceptions; man is no exception to either of these assertions, but, unlike other animals, his culture (e.g., northern U.S.A.), sub-culture (e.g., proper Presbyterian, midwestern large city), and immediate groups-of-reference (e.g., his nuclear family, family of origin, clubs, professional affiliations) determine to a considerable extent not only what

cognitions will occur, but also the degree of validity of a given class of cognitions. As we move from basic cognitive processes such as figure-ground formation and color perception to more complex organization of the cognitive field and to perception of objects as members of a class and as thus possessing certain properties attributed by the perceiver to members of that class, cultural determinants usually play a greater and greater role, and differences between groups become concomitantly greater. Within groups the situation is more complex, as group norms tend to minimize some differences and to maximize others, depending upon the specific group. The generalization can be made, however, that *within every group each individual is deceived into living in a world which is only partly real, when, of all animals, he has the greatest potentiality of living in the real world, and of modifying the real world in ways which are to his advantage.*

The thesis that the individual perceives only part of the reality "available" to him is hardly an original creation of the present author. It has been expressed throughout the centuries in various forms, some much more adequate than the brief statement above. For example, the ancient and recurring statements that people are "asleep" or "blind," or that they are "actors" without realizing that they are acting, are expressions of more or less the same thesis, as are numerous more recent expositions by philosophers, ethnologists, psychologists, sociologists, general semanticists, novelists, psychiatrists, etc. Alan Watts (1961) prefers to say that the individual is "hypnotized" by the culture; Erich Fromm (1941) has also used the analogy with hypnosis in describing the individual's empty role-taking and alienation from parts of himself and from others.³

Alfred Korzybski (1948), Eric Hoffer (1951), and Ernest Schachtel (1947) have written about similar processes, though with different words and emphases.

In thus grouping together such a wide variety of formulations, I do not mean to deny important differences between them, nor to argue that the general thesis is correct simply because many learned people have held it, but to emphasize that it is continually "rediscovered" and expressed in ways that sometimes obscure the underlying similarities. It is probably our false pride and our status striving, as well as the impossibility of reading everything, which often prevent our seeing and acknowledging that others have been trying to express that which we believe (sometimes correctly) we

can formulate more clearly and succinctly. My own preference for a formulation in terms of deception stems from the fact that in child-rearing practices, as in adult interactions, many concrete examples of intentional deception and of withholding of information which results in unintentional deception can be cited and corrected by telling the individuals concerned, in language they can understand, what one believes to be the truth. Comparisons with hypnosis and sleep, while valid, are both harder to exemplify and also less clear in terms of their implications; this is not to say that they are less important theoretically, or that they are not needed in a more complete account of socialization processes and remedies thereof.

IT IS LARGELY by means of language and definition of role that groups cast a veil of illusions over the individual. Language, especially, is a convenient vehicle for achieving some uniformity in illusions, as well as in valid perceptions, from one individual to another, in an especially deceptive and insidious manner (Schachtel, 1947; Adams, 1953). Definition of role is, however, at least a close second. Roles not only prescribe the "moves" which an individual is entitled to make in relationships with others; they penetrate the interior of the individual and prescribe his perceptions, thoughts, and feelings (Goffman, 1959; Sarbin, 1954). Role behavior is an expression of cognitive structure and *vice versa*.

If one examines any given processes of communication which are prescribed by roles and limited by language, one may become aware of something which is "not supposed" to be seen within the culture — namely, that the *processes under examination perpetuate the delusions and illusions of the members of the culture*. For example, the restrictions on communication in judicial processes tend to prevent the participants, including the defendant, from seeing that what is called "justice" is sometimes a hypocritical and tragic farce. On the other hand, a lawyer or a judge may, during the course of his career, gradually "wake up," and may continue to "play the game," and/or work toward judicial and legal reforms (Bazelon, 1960; Ploscowe, 1951).

Restrictions on communication very often serve the function of preserving false beliefs, and this function is frequently not recognized even by those who impose the restrictions. "The "excommunication" of an individual, for example, whether from a religious community, a professional group, or "society" in general, can permit false beliefs about the individual to be perpetuated. When comments

THE PSYCHEDELIC REVIEW

about an individual are made in his absence, for example, he has no chance to correct whatever false beliefs are expressed, or to contribute information which is lacking. *These false beliefs and incomplete information about excommunicated individuals play an extremely important part in the social life of the community.* This principle is partly recognized by those who refuse to form their beliefs about an individual on the basis of gossip and insist upon informing themselves firsthand, but the more general conservative function of exclusion is rarely perceived (Lemert, 1962).

◆ IT HAS BEEN RECOGNIZED for many years that "psychotic episodes" can be precipitated by insights into oneself. It was for this reason, in fact, that Freudians tended to avoid taking "pre-psychotics" into treatment, whereas Jung took the unpopular and "mystical" position that such episodes, preferably confined to the interviewing room, are the most effective, though admittedly hazardous, road to individuation.

The precipitation of psychotic episodes by insights into the outside world has been less well recognized, at least within the mental health professions. To acknowledge such a possibility is to acknowledge that the culture permits, teaches, or trains the individual to be blind or deluded; thus it locates pathology outside as well as inside the individual (and in his relation to the outside) and in particular it locates pathology in the most powerful institutions and authorities of the culture. Whereas the location of pathology within the individual is in accordance with the Western cultural tradition that the individual is "ignorant," "bad," "sinful," "deprived," or "depraved," except for the saving grace of outside forces, the location of pathology in the dominant institutions of the culture is hardly in accordance with the tradition of any culture. On the other hand, Western civilization, unlike some "primitive" societies, has contained and nourished also a tradition of critical examination of the world as well as of oneself, a tradition inevitably in conflict with institutions or cultural patterns which blind the individual. This duality is particularly obvious in northern U.S.A. culture, which from the days of the first Puritan settlers contained a strong trend toward critical self-examination — with surprising psychological sophistication — as well as strong conservative forces, without which no culture can survive (Smith, 1954).

It is not difficult to see how insights, whether into oneself or the outside world, can precipitate "psychotic" episodes, and why from

Psychosis: "Experimental" and Real

that point onward the individual is likely to find it difficult to articulate with the culture. There are at least two ways in which an "insight" can trigger a neurological "jam session": (1) by arousing an intense emotion and thus altering the chemical composition of the blood and consequently the functioning of the brain, and (2) by a sudden collapse of boundaries between two or more cognitive structures previously kept separated from each other, within that particular individual's total set of cognitive structures. Cognitive structures are presumably related in some manner to the structure of neurological processes (Kohler, 1938; Hebb, 1949; Miller, Pribram, and Galanter, 1960). A sudden change in the former is therefore presumably accompanied by a sudden change in the latter.

THESE TWO MECHANISMS are not mutually exclusive, and perhaps in most episodes they work hand-in-hand. The most important insights are probably those in which two or more cognitive systems, each available to consciousness, are brought into relation. The defense mechanism which breaks down is *compartmentalization*, which has been relatively neglected in the literature, possibly because it is a defense *par excellence* of most people called "experts," "scholars," "intellectuals," "technicians," or "scientists." Theorists are usually very particular, for example, about what is "relevant" to their "discipline" or "specialty," what they are or are not supposed or required to know or to do in their roles, exactly how an idea should be worded and the great superiority of one wording over another, etc. From the fields of logic and mathematics many clear examples can be drawn of valid isolation of cognitive systems and of apparently slight changes in wording which do in fact produce enormous differences in implications or in efficiency, and also some examples of invalid compartmentalization and of quibbling over symbols which obscures the similarity of underlying conceptual structures.

The evidence for the breakdown of compartmentalization in psychotic episodes is both phenomenological and behavioral. Phenomenologically, things seem to "run together" in ways that may be alternately bewildering, amazing, inspiring, amusing, bizarre, uncanny, terrifying, etc. Speech during such episodes is what would be expected when decompartmentalization occurs. What the individual says does not "make sense" in a conventional way; he does not stick to the point and instead drags in matters which appear to observers to be completely irrelevant. In other words, a massive dedifferentiation of cognitive systems and linguistic habits occurs,

THE PSYCHEDELIC REVIEW

which may be as bewildering to the individual as to those with whom he may attempt to communicate.

For any given individual the massive cognitive dedifferentiations called "psychotic episodes" result in more valid perceptions and beliefs in certain respects — the individual has now seen through some of his delusions and illusions, idiosyncratic and/or culturally taught, but they usually result in new delusions and illusions and in even less accurate perceptions and beliefs in some respects than before. Cognitive processes such as memory, attention span, control over impulsivity, and especially judgment are often impaired for much longer periods than the acute episodes themselves, and euphoric or dysphoric emotions may continue, often appearing "inappropriate" to others and sometimes to the person himself. The way in which the individual is classified according to the official psychiatric nomenclature depends upon the stage and circumstances during which he is examined, as well as who examines him, etc.

As each individual has lived in a somewhat different phenomenal world and has belonged to a different set of groups-of-reference from every other individual, and is subjected to a different environment and sequence of external events during his episodes, the *individual differences and communication difficulties among those who have experienced psychotic episodes tend to be much greater than among those who have not*, especially as the insights and ideas developed are often among those which cannot be expressed within the vocabulary of the individual or, even worse, among those which the language of the culture tends to militate against or rule out of existence or awareness. The kindness which a long-term patient may show toward a new one in a mental hospital is perhaps usually accompanied not by an understanding of that individual but simply by the realization that his phenomenal world, whatever it was, has collapsed, as did the long-term patient's world at some time in the past.

A GENERAL PRINCIPLE of social psychology is that members of groups are usually less open in their communications to outsiders than to other members of their own groups, i.e., tend to give less full and accurate information, to voice their convictions or doubts less freely, etc.⁴ The importance of this principle for the field of so-called "mental illness" can hardly be overemphasized, because the labelling of an individual as "mentally ill," "emotionally disturbed," "psychotic," "schizophrenic," "paranoid," etc., immediately moves the individual either entirely outside the group, or at least toward the

Psychosis: "Experimental" and Real

periphery. Whereas the designated patient often needs fuller and more accurate information than before, the information he receives is usually both less complete and less accurate. At the time when he is suffering most from feelings of alienation, he is likely to be treated in such a way as to increase his alienation, especially as he may behave in a way that is especially unattractive or repellent to others. Any demand for additional information is easily construed as "paranoid" by those who see no reason for his lack of trust, and who are thus blind without realizing it (Goffman, 1961). When people lie or withhold relevant information they usually, if not always, do so imperfectly; in other words, they emit incongruent messages. These incongruent messages often place the receiver into a "double bind" (Bateson, et al., 1956). *Lying and withholding of relevant information are perhaps the major causes of "mental illness," as well as the major ways in which such "illnesses" are perpetuated.*

Jung emphasized long ago that the road to individuation is narrow as a razor's edge, fraught with peril, and that only a few fail to lose their way. As an individual begins to see things as they are, in a way he has not done before — to see clearly not only his own blind and seamy past but also the stupidity, irrationality, cruelty, and blindness of his own culture and groups-of-reference, he must have not only great tolerance for pain, including feelings of alienation and uncanny emotions; unless he has advantages such as knowledge, power, status (albeit this is a two-edged sword), devoted friends and relatives, and financial independence, the burden is likely to be beyond the endurance of any human being. The restriction of the "sacred" mushrooms to high-caste individuals, found in some societies, makes considerable sense in this respect.

The solution found in Zen Buddhism and formulated clearly by Alan Watts of becoming a "joker," i.e., one who has seen through the arbitrariness or absurdity of social "games" but is able to "play" them anyway, is helpful but not sufficient, because, as Watts would presumably agree, *some social "games" must not be played but broken up*, if we are to avoid a complete Hell on Earth. For example, the "game" of "blame the Jews," "played" in Nazi Germany and in many previous and subsequent times and places, e.g., in Western Europe during the 14th century, when the Black Death was blamed on the Jews, must be broken up, although to be a "joker" might under some conditions be necessary as a device enabling one to operate underground in a different way, i.e., decently.

THE PSYCHEDELIC REVIEW

Some patients who refuse to leave mental hospitals are no longer interested in the "games" which people on the outside insist upon "playing," among these "games" being those of "blame it on the ex-patients," "be kind to ex-patients but be careful about trusting them or telling them the truth," "one step forward, one step back," "your private life is my business," "last things first, first things last," "if you don't believe it, pretend you do anyway," "don't let your right hand know what your left hand is doing," "be both prudish and pornographic," "be both mechanistic and mystical," "sentence first, trial afterward," "be both a coward and a gentleman," etc.⁵ Some patients also have a partly justifiable punitive attitude toward society — "since you say I'm crazy, you can pay my room and board, indefinitely."

All the psychedelic or "mind-manifesting" drugs attack the defense of compartmentalization and thus make it possible for an individual to see through some of the absurdities, including status systems, of his own behavior, and of his own culture and groups-of-reference.⁶ This, I believe, is the most important basis for attempts to ban or restrict the uses of these drugs, even more than the fact that, unlike alcohol, they make possible great pleasure without subsequent punishment, contrary to the long-standing "moral" dicta of Western civilization. The distinction, however, between "transcendental experiences" and "experimental psychoses" is, in my opinion, extremely unfortunate, and has resulted in a failure to recognize the great contribution that can be made by these drugs to an understanding of what we have been calling "psychosis." Several years ago the author heard Harold Abramson remark that every time someone takes a large dose of LSD-25 he undergoes an experimental psychosis. At that time I thought Dr. Abramson, who had worked extensively with this drug for several years, old-fashioned, and privately congratulated myself on being more informed and up-to-date, or even ahead-of-my-time. Now I am in complete agreement with his statement, granted that the term "experimental psychosis" can give a very misleading impression about drug experiences and that an "experimental psychosis" and a "real psychosis" are usually very different in some very important respects.⁷

The fact that an experience is extravagantly satisfying, in terms of emotions, sensations, and fantasy, complete with technicolor and sound-track, creatively and productively loaded with valid insights, does not justify our not labelling it "psychotic," unless we are to

Psychosis: "Experimental" and Real

drop the word altogether. To avoid using the word "psychotic," reserving the latter only for the frightened, suspicious, obviously deluded, depressed, constricted, or empty experiences, is to overlook what mental health experts — with the exception of Jung and a few other voices crying in the wilderness — have traditionally minimized, i.e., the *constructive* aspects of "psychosis." That "psychotic" experiences can be emotionally gratifying is grudgingly recognized in many descriptions of patients, but seldom does one find even a grudging recognition of the possible beneficial effects of these emotional orgies. The views of religious mysticism which have been held by most psychologists and psychiatrists make this one-sidedness particularly obvious. There is virtually no recognition of the possible value of *dysphoric* emotions. When it comes to cognition, there is again very little recognition of the constructive or creative aspects of psychosis, despite the repeated lesson from history that people who put forth truly new ideas — or old ideas which are unpopular or unfashionable — have often if not usually been said to be "insane," and that there has often been some truth in such accusations.⁸ In fact, labelling the innovator as "insane" has been a standard method of fighting genuinely new ideas, as opposed to old ideas whose deceptive rewordings are eagerly accepted as the latest fashion. It was the irrationality of this kind of opposition to new ideas which led William James to remark that one of the least important objections that can be made to any theory is that the man who invented it was insane. James's remark can be generalized: *one of the least important objections that can be made to any statement whatsoever is that the man who made it is "psychotic" or "mentally ill" or "emotionally disturbed."* By "least important objection" we understand that we are concerned with the *validity of the statement* and not with the question of giving the individual power over others, setting him up as a model for others to attempt to emulate, or encouraging the wholesale acceptance of everything he has said, or will say in the future.

Hell is at least as instructive as Heaven, and out of the Hell called "experimental psychosis" can come changes in the individual which are just as valuable or even more so than those arising from "transcendental experiences." The tendency to give the patient or subject as gratifying and "wonderful" an experience as possible, to protect him from later trouble, and to assert that those who have "bad experiences" or later conflict have not taken the drug in a "proper" context or with the "proper" preparation is a form of conservatism; the preceding word is not intended, however, to assign

THE PSYCHEDELIC REVIEW

this attitude to the lowest regions of Hell. It is kind to help people to grow, change, or regress (in the service of the ego, of course) gradually and relatively painlessly, but *it should not be assumed that gradual and painless change is always possible, or even necessarily desirable*. In a world as irrational as ours, to be fully human one must be capable of taking great and sudden pain.

Although raptures about "transcendental experiences" often focus primarily on the visual splendors and lofty insights into the meaning of existence and the universe and the increase in aesthetic sensitivity, the real source of enthusiasm is much more likely to be the strong feelings and bodily sensations which are aroused, often for the first time in many years or since the individual was very young. The ban on emotional expression, especially in Anglo-Saxon cultures and especially among men, makes the enthusiasm and wonder arising from drug-induced states readily understandable, because without emotional expression the emotions themselves wither away.⁹ To attribute one's enthusiasm to feelings and sensations is less congruent with these cultures than to praise the "higher level" processes. The same has been true in religious mysticism, although it has been pointed out many times that the bodily sensations in religious mysticism have become painfully obvious on occasion, e.g., when saints have "gone wild" and shouted that they desired the body of Jesus.¹⁰ In revivalism, also, emotional gratification is apparently the most important source of enthusiasm, although to the individual who has been "saved" the cognitive "insights" are believed to be the primary source (Sargant, 1957). Some individuals who have been "saved" have frequently felt good for months and have been able to live comfortably without searching for feeling through "sin," only to "fall from grace" eventually. Similarly, following gratifying emotional orgies during drug sessions, many subjects have been able to live for a time in their usual routine manner without boredom, eventually to crave another gratifying orgy, which may be conceptualized primarily as an opportunity to rise to a "higher" level of existence or knowledge, etc. The same can be said of many individuals who have experienced intense emotions during "depth" psychotherapy. The search for "meaning" in life is usually in large part a search for feeling; unless the individual becomes aware of the nature of his search, he may spend his life in a never-ending pursuit of cognitive "insights" or "understandings," like those scholars and scientists who keep searching for a "discovery" when their greatest needs would be met by standing up openly for what they already know or

Psychosis: "Experimental" and Real

believe, thus exposing themselves to the danger and excitement of external conflict.¹¹

All paths to individuation, whether through "psychosis," drug states, psychotherapy, Zen Buddhism, general semantics, philosophy, solitary confinement, Catholicism, Calvinism, thinking and reading on one's own, etc., are effective only if the individual can accept the chaff with the wheat, only if he can look squarely at the horrors of the world as well as its joys and beauty, can tolerate a variety of emotions (and thus supply his body with a variety of drugs), and can summon up the courage to act in accordance with his moral principles as well as his more obvious needs, and thus have some self-respect. In a society as hypocritical as ours is today, *the most socially unacceptable and dangerous acts are those which are most in accordance with the private moral convictions of the individual*. This is true not only for "intellectuals" and "worldly" people, but for "peasants" and "small-minded" people as well, because there are powerful individuals and groups on most sides of most fences, and because there is widespread cynicism about "fighting City Hall" and about standing up openly for one's private knowledge and convictions.

WESTERN CIVILIZATION has gone through a number of cycles or spirals which can be described as (1) the setting up of rules or "games"; (2) the development of hypocrisy, i.e., a discrepancy between the way things are — and are privately known to be, especially by those having access to large amounts of accurate information — and the way they are publicly acknowledged to be; and (3) the reduction of some forms of hypocrisy and the setting up of "new" rules. All three phases are present at any one time, with one or another phase dominant with respect to a given set of rules. Hypocrisy develops when official rules make satisfaction in living difficult or impossible — as, e.g., excessive official restrictions on emotional expression, sexual conduct, open conflict, excessive definition of role, etc.

In eliminating or reducing hypocrisy a *standardization* or *normalization* of the population has in past times occurred, and such normalizations have been extremely cruel and unjust, as certain individuals and groups have served as totem animals, taking on the projected collective guilt of the tribe, arising from hypocrisy, among other sources.¹² The "new" rules have tended to be the old rules in disguised form, or modified versions which have been even worse; some forms of hypocrisy are retained and new forms are created.

THE PSYCHEDELIC REVIEW

To a limited degree one must agree with the prophets of doom (Spengler, Toynbee, Sorokin) that Western civilization has been rolling downhill (Geyl, 1958). The normalization may occur under various headings: in southern France (Languedoc) in the 13th and 14th centuries and in many other areas during the same and succeeding centuries, under the heading of eliminating "heresy"; in Calvin's Geneva during the 16th century, under the heading of turning the citizens into sincere and honest "Christians"; throughout Western Europe during the 16th and 17th centuries, under the heading of eliminating "witchcraft"; and in 20th century Russia and Germany, under the heading of developing good "Communists" and "Nazis," respectively. *Each of these headings concealed certain normalizations which would have been impossible or more difficult to carry out if seen clearly for what they were.*

Secrecy has been of obvious advantage in normalizations. A second weapon is a principle made explicit by the inquisitors, by Calvin, and by the Communists and Nazis, which can be stated as follows: *a person who is off the norm in one respect is likely to be off the norm in another respect.* For example, a person who dressed oddly was suspect as a heretic. One of the most cruel of the inquisitors, Robert le Bugre, a reformed Patarin (Cathar), claimed to be able to detect a heretic by the manner in which he moved.¹³ Although ordinary citizens could help in rooting out heresy by informing anonymously on anyone who seemed "off the norm," *only an ideologist (inquisitor) could determine whether the individual was actually a heretic.* Since statistical studies were even worse than they are today, the "norms" themselves could be located conveniently in the fantasies of the ideologists, and could also be decreed by them to a considerable extent, as they gained power. Thus, the ideologists were able, in all these times and places, to "normalize" the population along whatever lines they desired or thought necessary. Languedoc had a culture distinctly different from that of northern Europe, and was in general more advanced. Under the heading of eliminating "heresy" it was transformed in the direction of northern France — the southerners, including devout Catholics, had to be "normalized."¹⁴ The elimination of "witchcraft," from the latter part of the 15th to the early part of the 18th century, was, among other things, the virtual liquidation of the remnants of a religion many centuries older than Christianity.¹⁵ Calvin, who had been called the "accusative case" by his more aristocratic and perhaps more ruthless and dishonest schoolmates, transformed the image of man a step

Psychosis: "Experimental" and Real

downward from that of the Catholic theologians, from "deprived" to "depraved," and liquidated or drove away the old aristocratic families of Geneva, many of whom belonged to the political party known as "Libertines." (It is worth noting that although Calvin never set foot in the New World, he has been probably as important to the development of the U. S. A. as any other man of modern times.¹⁶) The early Communist ideologists planned freedom in personal life and the "withering away of the state," but as class warfare progressed it was discovered that sex "immorality" was incompatible with being a good Communist, and that the State was helpful in keeping the masses in their proper places (Reich, 1962). During the Nazi revolution the Prussian military leaders, the old aristocracy, had to become even more cold and cruel than they had been before and to revise their standards of honor in the direction of those of a middle class individual much more cynically contemptuous of average human beings than they were.

During and immediately following a normalization, no one is allowed to be himself, as no one fits the "ideal" which is officially held and enforced; thus, alienation from parts of oneself is produced, with resulting fear and hatred which are then displaced toward those who are discernibly "different," i.e., outsiders, who are made into scapegoats. The great cruelty during normalization can be at least partly explained on the basis of this kind of process.

The drastic ideological changes and shifts of power which occur during normalization increase the frequency of psychotic episodes and other disturbances. *Mental illness is thus mixed in with religious, class, ideological, racial, and ethnic warfare.* The thesis that many of the "witches" were "mentally ill" is not incompatible with the thesis that many were followers of the Old Religion, or that many were members of the old landed gentry, who sometimes cling to old religions, especially out in the provinces, or that many were poor and ignorant. When one considers the widespread existence of practices such as forcing children to watch as their grandmothers or mothers were burned alive (Lea, 1939) — this was done by German Lutherans — it would seem strange if "mental illness" were not prevalent during that period. These children probably saw, without being able to formulate their perception clearly, that they were in the hands of destructive giant robots unaware of their irrational cruelty. Many of the children being labelled "schizophrenic" today may have had similar perceptions.

THE PSYCHEDELIC REVIEW

Both hypocrisy and the reduction of hypocrisy tend to increase the incidence of mental and emotional disturbances. During both phases behavior tends to be formal, secretive, and robot-like; people feel alienated and distrustful. Information "leaks out" or is deliberately provided, and *the people who are most likely to be precipitated into psychotic episodes (by sudden insights) are those from whom certain facts have been carefully concealed, in other words, women, especially old women.* When normalization starts, many people are "scared stiff" and thus are even more robot-like, suspicious, and cautious. The "schizophrenic" perception of individuals as mechanical puppets is probably a valid perception; the "schizophrenic" sees the robotization that Fromm (1941) and others have described. This perception can also be attained by means of the psychedelic drugs.

The greatly increased exposure to facts and ideas, through mass communication media, travel in foreign countries, etc., can greatly increase the frequency of psychotic episodes, according to the present theory. It is interesting, for example, that an "uneducated" person in a small town can purchase a paperback in a five-and-ten which can reveal to him that some of the peculiar ideas which for years he has taken as a sign of his secret insanity or depravity have been written about by Plato, Whitehead, Russell, Freud, Fromm, Carnap, etc.¹⁷

Hypocrisy is an unstable social condition, as everyone has to operate in a fog, but the reduction of hypocrisy can in theory be brought about by openly allowing people to be different and human, without a normalization. If our country avoids a normalization, it will be the first accomplishment of this kind in the history of Western civilization; nevertheless, there is reason for hope. Normalization requires the consolidation of power, and it is much more difficult to consolidate power in the U.S.A. than in any of the previous times and places, for the following reasons: there are two major cultures (with many influential sub-cultures), two major political parties, several large communication media, many powerful individuals and groups, and there are many checks and balances on an over-concentration of power within government. Furthermore, women, who find it more difficult to be deliberately cruel than do men, have much more power. Nevertheless, there is danger, as indicated by the following signs of the times: the tendency for activities to go "underground," so that it is difficult to obtain information which one believes that he has a right to know; ¹⁸ the ridicule of old women (most

Psychosis: "Experimental" and Real

of whom have done the best they could with what they have known); the emphasis on the public importance of one's private life; the attacks on fraternal organizations; the attacks on the old religion of Christianity; and the formation of new secret societies.¹⁹

There are those who wish to normalize this country under the heading of having only "good Americans"; others wish to normalize under the heading of eliminating or preventing "mental illness" (Szasz, 1961; Gross, 1962). An example of the first is an item which appeared in the *New York Times Western Edition* on Nov. 1, 1962, headed "Ideological split fills Amarillo with bitterness and suspicion." Among its other activities, the John Birch Society had attempted to purge schools and libraries of "Communist" reading matter. Several books, however, were removed for alleged "obscenities"; among these were four Pulitzer Prize novels and George Orwell's *Nineteen Eighty-Four*, a satire on collectivist society. Thus, under the self-deceptive heading of "eliminating Communism" comes a "clean-up," even though the Russians are apparently much "cleaner" than Americans and have objected to the "immoral" behavior of Americans visiting their country. All the previous normalizations have included "clean-ups" — that is why Europe is so clean. "Sex perversion," for example, was "cleaned up" in Germany by the inquisitors and later by the Nazis; these "clean-ups" account for the current absence of "sex perversion" in that country, just as the "clean-up" of prostitution in San Francisco in the 1930's accounts for the current absence of prostitution in that fair city. What has been virtually eliminated in "clean-ups" has not been "unclean" acts, which have if anything increased as exclusive pursuits, but love and friendship, which cowards envy and take satisfaction in destroying, reducing everyone else to their own empty and lonely condition. Any "lower" animal which could be taught to revile or be alienated from parts of its own body and the bodies of other members of its own species could easily be seen to be "mean and crazy." There are few data on this point; an experiment by Birch (1956) is relevant. In this experiment, hoods were placed around the necks of pregnant rats so that they were prevented from the usual self-licking of the anogenital region which is increased during pregnancy. When their young were born, these mother rats, with hoods removed, ate most of their pups and failed to nourish the rest adequately; none survived. The most "mean and crazy" humans, however, have not been female.

The possibility that normalization could occur under the heading of "eliminating mental illness" is illustrated by a remark made by

THE PSYCHEDELIC REVIEW

a leading psychoanalyst, Dr. Bernard Diamond, in addressing the Santa Clara County Mental Health Association — "A person who is off the norm in one respect is likely to be off in another respect." This is the principle referred to earlier, made explicit by the inquisitors and later by Nazi and Communists. Dr. Diamond himself is a relatively outspoken defender of the rights of individuals to live their private lives in the manner they choose rather than the manner he would choose for them; his statement, however, could easily be used in the service of tyranny by experts or others more powerful. Szasz (1961) has made a brief comparison between institutional psychiatrists and inquisitors, but even better analogies can be drawn between some psychotherapists in clinics and in private practice, and inquisitors. Members of the public, e.g., teachers and physicians, are encouraged to watch for "subtle signs of mental illness" (signs of heresy, signs of witchcraft) and to refer or report such individuals to the proper authorities for help, and outpatient treatment is now offered on an involuntary, as well as a voluntary, basis. Psychiatrists may be able to achieve much more power than they have at present, but if they do not align themselves on the side of the rights of individuals, they will become even more hated and feared than were the inquisitors. This remark should not be construed as an endorsement of "rights" such as walking down the street shouting insults or making scary faces, physical assault, vandalism, urinating on a busy street in broad daylight, etc. If we are to preserve our freedoms, however, *involuntary* confinement resulting from such acts should be for a stated maximum length of time, not an indefinite stretch the termination of which is to be decided by an ideologist.

DURING CULTURAL REVOLUTIONS the dominant ideologists provide the rationalization for normalization. Psychology (broadly defined) is now, as before, a focal point of ideological controversy. Modern psychodynamic theories (and some learning theories and theories of interpersonal relations) share with medieval theology (the psychology of that era) the following characteristics: (1) complexity; (2) formulation in learned language unknown to the vast majority of people; (3) the appearance of objectivity, at the same time allowing sufficient concealed and self-deceptive subjectivity to be used in the service of the ideologists; (4) the principle of reversal, so that someone or something can be shown by the ideologist to be "in reality" just the opposite from what he or it appears to be to the unlearned observer; and (5) an emphasis on sex and other puzzling and troublesome aspects of human or extra-human relationships such

Psychosis: "Experimental" and Real

as status, power, or control. These are highly desirable characteristics for an ideology which can be used to divide, conquer, and establish tyranny.

Concepts which would interfere with normalization and with those forms of hypocrisy which are retained or created tend to become extinct or to be considered inadequate, irrational, or old-fashioned. Among these concepts are courage, honor, decency, integrity, loyalty, truth, friendship, honesty, love, kindness, fun, and fair-play.²⁰ These concepts have been largely ignored in the psychology of our time, as the reader can check for himself by examining the subject index of *Psychological Abstracts*, which covers many "disciplines" in addition to psychology and includes foreign as well as domestic references. For example, during the 36 years of its publication, the index lists nine references under "courage," the latest being in 1948.²¹

Ideologies preserve certain attitudes and ideas within the culture and eliminate others. Old ideas and attitudes are reworded and claimed to be new discoveries by the ideologists, especially those who are ignorant of history and of the sociology of knowledge. The dominant ideology of the U. S. A. has been Calvinism, and some psychological theories and methodologies (as well as some varieties of "common sense") are more-or-less disguised forms of Calvinism (Fromm, 1941). Calvinism had several facets, including a mean and crazy aspect exemplified by the beheading of a child in Calvin's Geneva for striking one of his parents, thus upholding "parental authority." This mean and crazy aspect of Calvinism was carried to the U.S.A. in many ways, e.g., in the old Connecticut "blue laws" which gave fathers the legal right to kill disobedient sons (Dollard & Miller, 1950). Calvin outlawed most types of pleasure, even in the privacy of one's own home, and this aspect of Calvinism was also imported (Smith, 1954).²²

Individuals who oppose powerful social institutions are sometimes labelled "insane." An instructive example is Thomas of Apulia, who in the 14th century, when Western Europe resembled an old-fashioned asylum, preached that what was needed was more love and less theology and Church ritual, that the reign of the Holy Ghost had supplanted that of the Father and Son, and that he was the envoy of the Holy Ghost sent to reform the world. The learned theologians of the University of Paris burned his book, and he was pronounced insane by medical alienists and committed to life imprisonment, probably as a means of discrediting his work (crowds had been listening

THE PSYCHEDELIC REVIEW

to him) more than as a "humane" alternative to the stake. Yet men like Thomas have been relatively sane, whereas "homo normalis," as Wilhelm Reich (1949) called him, has often been mean and crazy, and this has been especially true of his cynical leaders.

One method of reducing hypocrisy and at the same time preventing normalization is to defend the right to be "crazy" in the sense of (1) seeking and loving the truth;²³ (2) loving people instead of hating them;²⁴ (3) openly respecting the rights of others to be different from oneself and one's own friends or colleagues; (4) living primarily in accordance with values other than status, power, security, or material possessions; (5) openly challenging powerful authorities and institutions; and (6) being a socially unacceptable truth-teller instead of a socially acceptable liar.



Summary

A theory of psychosis as a sudden and drastic change in cognitive structure has been presented. The ways in which socialization, including deception, creates cognitive structures which change rapidly upon exposure to new information have been described. The psychedelic drugs attack compartmentalization and thus produce insights into some of the absurdities within the individual and also within the social structure in which he is embedded. The constructive aspects of psychosis, "experimental" or real, have been greatly neglected in the literature. Psychology is a focal point in ideological conflict, as it has been in past cultural revolutions. Normalization, i.e., the reduction or elimination of certain individual differences and human qualities, has accompanied the reduction of hypocrisy in previous cultural revolutions, but there are reasons to believe that hypocrisy can be reduced in the U. S. A. without such normalization. Suggestions are made for the accomplishment of this objective.

FOOTNOTES

¹ The ideas expressed herein are in large part the result of the observations and experiences of the author during the two years of his tenure as USPHS Fellow, 1958-1960, and as a staff member of NIMH Project MY-2621, located at the Mental Research Institute, Palo Alto Medical Research Foundation, Don D. Jackson, Principal Investigator, James Terrill, Staff Psychologist, Charles Savage and Jerome Oremland, Research Associates. Grateful acknowledgment is made to Thomas Gonda, Department of Psychiatry, Stanford University, who sponsored my fellowship application, and to Leo Hollister, Richard Hamister and John Sears, who cooperated in the biweekly administration of LSD-25 to two hospitalized patients over a period of many months at the VA Hospital, Palo Alto. The views expressed herein are emphatically the sole responsibility of the author, who experienced a psychotic

reaction lasting several months following a 200 µg LSD-25 session, without hospitalization, and one year later managed to experience a spectacular psychotic episode without benefit of drugs, resulting in one month's hospitalization. The statements herein are by no means free of the biases or values of the author; for example, I do not like to see people kept deceived or locked up for years in order to help preserve respectability, the sex mores, or status systems. I have no complaints whatsoever concerning my own treatment, and I consider myself extremely fortunate indeed.

² The epistemological position of the author is similar to and perhaps identical with that taken by the founders of Gestalt psychology long ago and recently discovered by many others. See, for example, Koffka, 1935, and Kohler, 1938.

³ A beautiful and moving literary expression of the idea that people are only half-awake is found in Thornton Wilder's play, *Our Town*. Al Hubbard, one of the pioneer workers with LSD-25, expressed this idea very well by the informal remark, "Most people are walking in their sleep; turn them around, start them in the opposite direction, and they wouldn't even know the difference."

⁴ This statement assumes that group membership is defined in other ways; in other words, the statement is intended as an empirical assertion, not as a tautology. Important exceptions sometimes occur when anonymity is guaranteed, when the recipient of information is sworn to secrecy, etc. The free exchange of "confidential" information about designated "patients" between "experts" whose group membership is defined in terms of being "expert," accounts for the feeling of alienation which some "experts" have toward their "patients," to whom these "experts" never say anything which they believe would not be "good" for the "patient." Such "experts" are very similar to many other politicians.

⁵ "No, no!" said the Queen. 'Sentence first — verdict afterwards.'
"Stuff and nonsense!" said Alice loudly. 'The idea of having the sentence first'
'Hold your tongue!' said the Queen, turning purple. . . ." (quoted by Jourdain (1918, p. 96) from *Alice's Adventures in Wonderland*.)

⁶ Unfortunately these drugs have sometimes resulted in new status systems which compete in absurdity with any others in existence, including those in psychoanalytic circles.

⁷ It is especially important that the subject understand that the drug is responsible for his craziness or his loftiness and that his craziness or his loftiness will be only temporary. When drugs are given without the subject's knowledge, as, e.g., certain criminals have been reported to have done in India with a mixture of marijuana and datura, the "experimental psychosis" can become very real indeed. See Osmond and Hoffer (1958).

⁸ Sir Isaac Newton is an example of someone who became "psychotic" after putting forth a new idea, experimentally demonstrable, and seeing how his learned colleagues in the Royal Academy reacted. He did not publish again for about 20 years, meanwhile writing "metaphysics" (which is kept locked up, a source of embarrassment to physicists).

⁹ Smith (1954) tells of the history of what the early Puritans called the heresy of Antinomianism, of giving way to subjective conviction, emotion, and impulsivity. Southerners were considered generally tainted with this terrible heresy. It survives as a form of "mental illness" or a "sign" of mental illness, especially according to northern experts.

¹⁰ It has usually not been noted that such a desire may be very rational in a world in which men consider some parts of their bodies "dirty" and look upon virginity as the "highest" state of womanhood.

¹¹ Much of what is called "epistemology" and "methodology" is a complex

- and deceptive rationalization of cowardice. This has been particularly obvious in the field of philosophy, in which the convenient though double-edged idea developed very early that one cannot know or communicate anything — "Nothing is; or, if anything is, it cannot be known; or, if anything is and can be known, it cannot be communicated," (Gorgias, ca. 500 B.C.). The principle is also readily discernible in psychology, history, and the social sciences. One form of this principle was called the "good taste psychosis" by Harry Elmer Barnes, who added that the good taste psychosis among respectable historians was the greatest enemy of truth in his field.
- 12 Among these have been especially the following: women, children, old people, followers of old religions, the old aristocracy, people in the "provinces," uneducated people, especially of the "lower classes," Jews, Gypsies, and people who are "odd," who don't "fit in." Most of these totem animals cannot easily fight back; that explains their selection as totem animals. Remnants of the old aristocracy who have managed to retain some power are discredited on the basis of their "bad" sex lives, or allegations thereof.
 - 13 The English word "bugger," and similar vernacular expressions in French and Italian, stem from the word "Bugres," by which the Cathari were designated because of their Bulgarian origin. The full significance of this derivation is not known to the present author, but Robert's cruelty illustrates how dangerous it can be to reform someone. He was finally locked up himself.
 - 14 Current attempts to describe southern U. S. A. character structure in pathological terms can be partly understood in terms of the general phenomenon of acculturating conquered territory. This is not to say that these attempts are invalid, but that northern character structure is also pathological, though in a different way. The northern treatment of Negroes, for example, is at least as irrational as the southern treatment, though in a way which differs behaviorally and psychodynamically. There has never been a culture that has not created pathological character structures, i.e., all "national character structures" are pathological in some ways and to some extent.
 - 15 Christianity as actually practiced was by no means always clearly distinct from the Cult of the Horned God, just as in contemporary Latin America Christianity is not always distinct from the indigenous Indian religions.
 - 16 One of the author's grandiose delusions during his real psychosis was that he was a reincarnation of John Calvin, among other historical figures. My conviction that it would be salutary to lock everyone in solitary confinement at least once during his lifetime shows that this delusion, like most, has at least a grain of truth. I was also tortured by the delusion that I was an actual descendent of that mean hypocrite, John Knox, the founder of Scottish Presbyterianism.
 - 17 Many philosophers, e.g., Nietzsche, Schopenhauer, Wittgenstein, have gone "insane." It seems probable that they saw through the absurdities of their own cultures, i.e., they ate of the forbidden fruit of the tree of knowledge (cf. May, 1961).
 - 18 Several writers, e.g., Hanson Baldwin, have recently written of the prevalence of the mentality that values secrecy even when it is clearly unnecessary.
 - 19 The secret patriotic societies of the 1840's and 1850's, members of which were called "Know Nothings" by outsiders, are interesting antecedents of such societies at the present time.
 - 20 A reputable psychologist has been unable to find a publisher for a manuscript on love behavior, containing empirical data of a non-obscene variety. One publisher informed him that the topic was not of sufficient interest. When a professor of psychology at one of our leading universities

announced that a graduate student was planning a dissertation on the subject of friendship, another member of the department exclaimed in surprise, "Friendship! — What kind of damned topic is that?" The Association for Humanistic Psychology has been formed to attempt to encourage interest and research in these and related concepts.

- 21 John F. Kennedy (1956) and Sir Compton Mackenzie (1962) have written interesting books on the subject of moral courage, but their works are not abstracted, as they are not members of our learned groups.
- 22 For example, whereas the State of California has outlawed drunkenness only in public places, the City of San Jose has an ordinance against being drunk anywhere within the city limits, including one's own home. It is true that no attempt is made to enforce this ordinance, but neither is it repealed as absurd. The State statute is used discriminately: "respectable" citizens found drunk in public places are either left alone or escorted discreetly to their homes, whereas "lower" class people are often thrown into the "drunk" tank or taken involuntarily to a mental hospital, etc. This is an example, though not one of the worst, of hypocrisy as defined earlier.
- 23 Translated into what is sometimes considered "scientific" psychodynamic theory, this means that someone has repressed his desire to sleep with the null class. The idea that the concept of truth is dispensable is an old idea, "discovered" by various scientists and philosophers of this century. La Barre (1954) gives one form of this idea, stating that truth in mathematics is relative to what is called "mathematics" within the culture. This is similar to the view of mathematics presented to psychologists by S. S. Stevens (1951), with a different formulation. It is correct for parts of mathematics but not for other parts, especially the oldest parts such as the theory of numbers (Myhill, 1952, 1960).
One of the most deflating papers ever written is that by Ness (1938). In this paper Ness demonstrated that people, selected more-or-less haphazardly off the street, expressed all the concepts of truth to be found among the writings of philosophers. One can imagine how this discovery endeared him to his learned colleagues.
On loving psychology, see Bugental (1962).
- 24 Although I do not love everybody, I try not to hate anyone. Sometimes, however, I apparently do not try hard enough; I would be delighted to read in the newspaper that certain "experts" had been eaten by crows, and that some of the oversized cowards in high public and private office had fallen overboard on one of their many voyages, been caught in nets, sliced up and boiled down for whale oil. In baboon societies the larger and stronger males remain on the outskirts, as the colony moves along the ground, and thus are the first to encounter danger. This demonstrates that large baboons tend to have more courage and *noblesse oblige* than many large men. There are, nevertheless, some large men of the right type — these are the ones who are not afraid of someone who shows that he is not afraid of them. Mr. Crawford Greenwalt is an example of a man in a high position who could do a great deal more for this country than criticize the psychological testing industry (Gross, 1962). Like Gross, he fails to see, or at least to say, that this horrendous industry is carrying out the directives of more powerful agents and of impersonal social forces.

References

- Adams, J. K. Concepts as operators. *Psychol. Rev.*, 1953, 60, 241-251.
Adams, J. K. Differentiation and dedifferentiation in healthy functioning. *J. Human. Psychol.*, 1961, 1, No. 2, 30-38.

THE PSYCHEDELIC REVIEW

- Adams, J. K. The overemphasis on sex in Western civilization — a point of view. *J. Human. Psychol.*, 1963, 3, No. 1, 54-75.
- Anonymous. A new theory of schizophrenia. *J. Abnorm. Soc. Psychol.*, 1958, 57, 226-236.
- Asch, S. *Social Psychology*. New York: Prentice-Hall, 1952.
- Bateson, G., Jackson, D. D., Haley, J., and Weakland, J. H. Toward a theory of schizophrenia. *Behavioral Sci.*, 1956, 1, 251-264.
- Bazelon, D. L. Crime and insanity. In *The mentally ill offender: a symposium*. Sacramento: Dept. of Mental Hygiene, 1960.
- Beers, C. W. *A mind that found itself*. New York: Doubleday, 1921.
- Birch, H. G. Sources of order in the maternal behavior of animals. *Amer. J. Orthopsych.*, 1956, 26, 279-284.
- Boisen, A. T. *The exploration of the inner world*. Chicago, New York: Willett, Clark, 1936.
- Bugental, J. F. T. Precognitions of a fossil. *J. Human. Psychol.* 1962, 2, No. 2, 38-46.
- Bugental, J. F. T. Self-fragmentation as a resistance to self-actualization. *Rev. Exist. Psychol. & Psychiat.*, 1962, 2, 241-248.
- Carnap, R. *Meaning and necessity*. Chicago: Univ. of Chicago, 1947.
- Carroll, L. *Alice's adventures in Wonderland, Through the looking-glass, and The hunting of the snark*. New York: Modern Library.
- Chandler, A. L. and Hartman, M. A. Lysergic acid diethylamide (LSD-25) as a facilitating agent in psychotherapy. *AMA Arch. Gen. Psychiatry*, 1960, 2, 286-299.
- Cohen, S. Notes on the hallucinogenic state. *Int. Rec. Med.*, 1960, 173, 380-387.
- Dobbs, Z., et al. *Keynes at Harvard*. Revised edition. New York: Veritas Foundation, 1962.
- Dollard, J. & Miller, N. *Personality and psychotherapy*. New York: Mc-Graw-Hill, 1950.
- Fromm, E. *Escape from freedom*. New York: Farrar & Rinehart, 1941.
- Geyl, P. *Debates with historians*. New York: Meridian Books, 1958.
- Goffman, E. *Asylums*. Garden City, N. Y.: Doubleday-Anchor, 1961.
- Goffman, E. *Presentation of self in everyday life*. Garden City, N. Y.: Doubleday-Anchor, 1959.
- Gross, M. L. *The brain watchers*. New York: Random House, 1962.
- Hebb, D. O. *The organization of behavior*. New York: Wiley 1949.
- Hoffer, E. *The true believer*. New York: Harper, 1951.
- Jourdain, P. E. B. *The philosophy of Mr. B*rr*nd R*ss*l*. London: Allen & Unwin, 1918.

Psychosis: "Experimental" and Real

- Jung, C. *Two essays on analytical psychology*. New York: Meridian Books, 1956.
- Kelly, G. A. *The psychology of personal constructs*. New York: Norton, 1955.
- Kennedy, J. F. *Profiles in courage*. New York: Harper, 1956.
- Kesey, K. *One flew over the cuckoo's nest*. New York: Viking, 1962.
- Krech, D. & Crutchfield, R. S. *Theory and problems of social psychology*. New York: McGraw-Hill, 1948.
- Kohler, W. *The place of value in a world of facts*. New York: Liveright, 1938.
- Koffka, K. *Principles of Gestalt psychology*. New York: Harcourt-Brace, 1935.
- Korzybski, A. *Science and sanity*. Third edition. Lakeville, Conn.: International Non-Aristotelian Library, 1948.
- La Barre, W. *The human animal*. Chicago: University of Chicago, 1954.
- Lea, H. C. *History of sacerdotal celibacy in the Christian Church*. Third edition, revised. London: Williams & Norgate, 1907.
- Lea, H. C. *The inquisition of the middle ages*. New York: Macmillan, 1961. (An abridged version of a much longer work first published in 1887-1888.)
- Lea, H. C. *Materials toward a history of witchcraft*. Philadelphia: Univ. of Pennsylvania, 1939. New York, London: Thomas Yoseloff, 1957.
- Lemert, E. M. Paranoia and the dynamics of exclusion. *Sociometry*, 1962, 25, 2-20.
- Mackenzie, C. *Certain aspects of moral courage*. New York: Doubleday, 1962.
- Matthew, et al. *The New Testament*.
- May, R. The meaning of the Oedipus myth. *Rev. Exist. Psychol. and Psychiat.*, 1961, 1, 44-52.
- McReynolds, P. Anxiety, perception, and schizophrenia. In Jackson, D.D. (Ed.), *The etiology of schizophrenia*. New York: Basic Books, 1960.
- Mills, C. W. *Power, politics, and people*. New York: Ballantine, 1963.
- Myhill, J. Some philosophical implications of mathematical logic. *Rev. Metaphysics*, 1952, 6, 165-198.
- Myhill, J. Some remarks on the notion of proof. *J. Philos.*, 1960, 57, 461-471.
- Ness, A. 'Truth' as conceived by those who are not professional philosophers. *Skrifter Utgitt av Det. Norske Videnskaps-Akademi i Oslo, II Hist.-Filos. Klasse*, 1938, No. 4.
- O'Brien, B. *Operators and things*. Cambridge, Mass.: Arlington Books, 1958.
- Osmond, H. A review of the clinical effects of psychotomimetic agents. *Annals New York Acad. Sci.*, 1957, 66, 418-443.

THE PSYCHEDELIC REVIEW

- Osmond, H. & Hoffer, A. The case of Mr. Kovish. *J. Ment. Sci.*, 1958, 104, 302-325.
- Plato. A touchstone for courage. *Psychedelic Rev.*, 1963, 1, No. 1, 43-46.
- Ploscowe, M. *Sex and the law*. New York: Prentice-Hall, 1951.
- Reich, W. *Character analysis*. New York: Orgone Institute Press, 1949.
- Reich, W. *The sexual revolution*. Fourth edition. New York: Noonday Press, 1962.
- Sarbin, T. R. Role theory. In Lindzey, G. (Ed.), *Handbook of social psychology*. Cambridge, Mass.: Addison-Wesley, 1954.
- Sargant, W. *Battle for the mind*. Baltimore: Penguin Books, 1961.
- Schachtel, E. On memory and childhood amnesia. *Psychiatry*, 1947, 10, 1-26.
- Smith, C. P. *Yankees and God*. New York: Hermitage House, 1954.
- Stevens, S. S. Mathematics, measurement, and psychophysics. In Stevens, S. S. (Ed.), *Handbook of experimental psychology*. New York: Wiley, 1951.
- Sullivan, H. S. *Schizophrenia as a human process*. New York: Norton, 1962.
- Szasz, T. S. *The myth of mental illness*. New York: Hoeber-Harper, 1961.
- Taylor, G. Rattray. *Sex in history*. New York: Vanguard, 1954.
- Terrill, J., Savage, C., & Jackson, D. D. LSD, transcendence and the new beginning. *J. Nerv. Ment. Disease*, 1962, 135, 425-439.
- Watts, A. W. *Psychotherapy east and west*. New York: Pantheon Books, 1961.
- Wilder, T. N. *Our town*. New York: Coward-McCann, 1938.

Botanical Sources of The New World Narcotics ❖

RICHARD EVANS SCHULTES

Man has learned to rely upon the plant kingdom not only for life's necessities but also its amenities and ameliorants, in virtually every part of the world. None of the ameliorants has had a more absorbing history nor better shows man's cleverness and ingenuity than those which we call the *narcotics*.

The very word "narcotic" has taken on a sinister meaning in American culture. There is probably no field — save perhaps religion and politics — so replete with popular misinformation and purposeful misrepresentation. This condition is general, yes, even universal, insofar as the public is concerned. But its paralysis has invaded even our technical circles. The misuse of the terms "habit-forming" and "addictive," for example, is found even amongst our students. It is a fact that there are but two plant narcotics known to cause addiction and to be physically, morally and socially so dangerous that they must be strictly controlled — this fact is lost to most people, for whom it is enough that a substance be called a *narcotic* to draw away aghast.

I use the term "narcotic" in its classic sense. It comes from the Greek "to benumb" and, therefore, broadly applies to any substance (howsoever stimulating in one or several stages of its physiological activity) which may benumb the body.

The use of narcotics is always in some way connected with escape from reality. From their most primitive uses to their applications in modern medicine, this is true. All narcotics, sometime in their history, have been linked to religion or magic. This is so even of such narcotics as tobacco, coca and opium which have suffered secularization — which have come out of the temple, so to speak, have left the priestly class and have been taken up by the common man. It is interesting here to note that, when problems do arise from the employment of narcotics, they arise after the narcotics have passed from ceremonial to purely hedonic or recreational use. This historical background can explain much, especially when we realize that there are still some

* A composite of two lectures ("Native narcotics of the New World" and "Botany attacks the hallucinogens") delivered in the Third Lecture Series, 1960, College of Pharmacy, University of Texas, and published in the Texas Journal of Pharmacy 2 (1961) 141-185. Slight changes from the original text have been made in several places, and additional information has been added to bring the treatment of the subject up to date.

THE PSYCHEDELIC REVIEW

narcotics used by primitive peoples only in a religious or magic context: peyote is a good example. This is why the botanist who goes out to search for new narcotics in primitive societies must be versed in and sympathetic to anthropological or ethnological fields — and we have come to refer to this type of scientist as an ethnobotanist.

None of the New World narcotics, save tobacco and coca, has assumed a place of importance in modern civilization, and many are still rather unfamiliar even to our botanists, chemists and pharmacologists. It is for this reason that I have chosen, even at the risk of seeming rather superficial, to say a few words about each of the native New World narcotics, with almost all of which I have had personal experience in the field over a long period. By doing this, I hope to give you an overall picture of what we may term the "narcotic complex" of New World peoples. For sundry of these, the literature, though recondite, is extensive, covering many fields of research; but for the greater number, bibliographic sources are few and pertain to only one or two fields of investigation. Reference to tobacco and alcohol, both native American narcotics, will be omitted from this brief article.

The identification of the source plants of American narcotics has interested me since 1936. Consequently it is natural, I suppose, that my remarks should be heavily botanical. That the final and complete understanding of narcotic plants rests solely and fundamentally on a knowledge of their botanical sources makes it obvious that the first step must be made in the direction of botany or ethnobotany. Convinced of the importance of this step, I have studied narcotic plants among North American Indians in Oklahoma, have made several trips into the Mazatec, Chinantec and Zapotec Indian country of northeastern Oaxaca, Mexico, and lived almost without interruption, from 1941 to 1953, in the northwest Amazon and the northern Andes of South America.

For some of the plants mentioned, there are no chemical, much less pharmaceutical, data. For some, even, there are still serious problems concerning their botanical source or sources. Here, then, lies one of the most promising fields for research, for we know that tropical America still holds secrets in connection with narcotic plants.

For general purposes, there is probably no more serviceable classification of the plants man uses in his striving for temporary relief from reality than that proposed by the German toxicologist, Louis Lewin.

Of Lewin's five categories, i.e., *Excitantia*, *Inebriantia*, *Hypnotica*, *Euphorica*, *Phantastica*, none has stirred deeper interest through the ages, and none has foretold a greater field for discovery for the present and future, than the *Phantastica*. There have recently been proposed very learned and intricate words to distinguish the several kinds of narcotics. Our modern terminology has come to call these the *hallucinogens*, the *psychotomimetics*, or the *psychedelics*. Differing from the psychotropic drugs, which normally act only to calm or to stimulate, the hallucinogens or psychedelics act on the

Botanical Sources of the New World Narcotics

central nervous system to bring about a dream-like state, marked (as Hofmann points out) by extreme alteration in the "sphere of experience, in the perception of reality, changes even of space and time and in consciousness of self." They invariably induce a series of visual hallucinations, often in kaleidoscopic movement and usually in rather indescribably brilliant and rich colors, frequently accompanied by auditory and other hallucinations and a variety of synesthesias. Notwithstanding this mushrooming new nomenclature, it seems to me difficult to find a simpler and more serviceable classification than that of Lewin.

It is of interest that the New World is very much richer in narcotic plants than the Old and that the New World boasts at least 40 species of hallucinogenic or phantastica narcotics as opposed to half a dozen species native to the Old World.

It is clear that medical and psychological research into these strange agents, at a painfully embryonic state at the present time, promises more than we are able fully to comprehend. Powerful new tools for psychiatry may be only one of the results of such investigations. But research into the effects of these substances on the human mind must be carried out carefully, without haste or superficiality and, above all, by the most qualified personnel, for what may be one of the most promising fields for progress ever within man's grasp can easily be jeopardized or utterly destroyed by irresponsible and inadequately planned research or by the manipulations of dilettantes.

Ayahwasca, Caapi, Yajé

One of the weirdest of our phantastica or hallucinogens is the drink of the western Amazon known as *ayahwasca*, *caapi* or *yajé*. Although not nearly so popularly known as peyote and, nowadays, as the sacred mushrooms, it has nonetheless inspired an undue share of sensational articles which have played fancifully with unfounded claims, especially concerning its presumed telepathic powers.

In spite of its extraordinarily bizarre ability to alter man's physical and mental state, this narcotic drink finally disclosed itself to prying European eyes only about a century ago. And it remains one of the most poorly understood American narcotics today.

The earliest mention of *ayahwasca* seems to be that of Villavicencio in his geography of Ecuador, written in 1858. The source of the drug, he wrote, was a vine used "to foresee and to answer accurately in difficult cases, be it to reply opportunely to ambassadors from other tribes in a question of war; to decipher plans of the enemy through the medium of this magic drink and take proper steps for attack and defense; to ascertain, when a relative is sick, what sorcerer has put on the hex; to carry out a friendly visit to other tribes; to welcome foreign travellers or, at least, to make sure of the love of their womenfolk."

A few years earlier, in 1852, that tireless British plant explorer, Richard

THE PSYCHEDELIC REVIEW

Spruce, had discovered the Tukanoan Indians of the Uaupés in Amazonian Brazil using a liana known as *caapi* to induce intoxication. His observations were not published until the posthumous account of his travels appeared in 1908.

One of Spruce's greatest contributions to science was his precise identification of the source of *caapi* as a new species of the *Malpighiaceae* which was called *Banisteria Caapi*. The correct name is now *Banisteriopsis Caapi*, since it has been shown to be not a true *Banisteria*.

The natives of the upper Rio Negro of Brazil use it for prophetic and divinatory purposes and also to fortify the bravery of male adolescents about to undergo the severely painful *yurupari* ceremony for initiation into manhood. The narcosis amongst these peoples, with whom I have taken *caapi* many times, is pleasant, characterized, amongst other strange effects, by colored visual hallucinations. In excessive doses, it is said to bring on frighteningly nightmarish visions and a feeling of extremely reckless abandon, but consciousness is not lost nor is use of the limbs unduly affected.

Two years later, in 1854, Spruce encountered the intoxicant along the upper Orinoco, where the natives chewed the dry stem for the intoxicating effects. Again, in 1857, he came upon *ayahuasca* in the Peruvian Andes and concluded that it was "the identical species of the Uaupés, but under a different name."

Later explorers and travellers — Martius, Orton, Crévaux, Koch-Grünberg and others — referred to *ayahuasca*, *caapi* or *yajé* but in an incidental, even casual, manner. All agreed, however, that the source was a forest liana.

In the years following the early work, the area of use of *Banisteriopsis Caapi* was shown to extend to Peru and Bolivia, and several other species of the genus with the same use were likewise reported from the western Amazon. Of outstanding interest was the work in 1922 of Rusby and White in Bolivia and the publication by Morton in 1931 of notes collected by Klug in the Colombian Putumayo. Similarly, the work of the Russians Varonof and Juzepczuk in the Colombian Caquetá in 1925-6 added information of interest to the whole picture.

Serious complications, however, early entered the story of the correct identification of *ayahuasca*, *caapi* and *yajé*. Back in 1890, Magelli, a missionary in Ecuador, through a misuse of the native names for Jivaro intoxicants, confused our malpighiaceae vine-narcotics with one of the tree-species of *Datura*. The effects of the two psychotomimetics differ widely. This confusion, fortunately, did not enter the pharmacological or chemical literature.

A complication which has, however, sorely plagued both the botanical and the chemical literature, even as recently as 1957, stems from the days of Spruce. This meticulous observer noted, when he discovered *caapi* and identified its source, that another kind called *caapi-pinima* or "painted *caapi*" in the Rio Negro area might be "an apocynaceous twiner of the genus *Haemadictyon*, of which I saw only young shoots without any flowers." "The leaves," he

Botanical Sources of the New World Narcotics

wrote, "are of a shining green, painted with the strong blood-red veins. It is possibly the same species . . . distributed by Mr. Benthham under the name of *Haemadictyon amazonicum*. It may be the *caapi-pinima* which gives its nauseous taste to the *caapi* . . . and it is probably poisonous, but it is not essential to the narcotic effect of *Banisteria* . . ." I have consulted Spruce's unpublished notes at the Royal Botanic Gardens at Kew and find that he stated that the *caapi* drink is made from the lower parts of the stems of *Banisteriopsis Caapi* "beaten in a mortar with the addition of water and a small quantity of the slender roots of the Apocynac (apparently a *Haemadictyon*) called *caapi-pinima* . . . May not the peculiar effects of the *caapi*," he queried, "be owing rather to the roots of the *Haemadictyon* than to the stems of the *Banisteria*? The Indians, however, consider the latter the prime agent, at the same time admitting that the former is an essential ingredient."

It is clear that Spruce suspected that the apocynaceous vine might play a role in causing the intoxication. But he was not sure. Nor did he make any definite statement, being careful to point out that *Banisteriopsis* alone could produce hallucinogenic effects.

Recent botanical work has shown that the genus *Haemadictyon* is not distinct from *Prestonia*. *Haemadictyon amazonicum*, therefore, is now correctly called *Prestonia amazonica*. It is a species known from only one collection, that made by Spruce along the lower Amazon in Brazil. We must assume, consequently, that it is a very strict endemic.

Now, I have previously pointed out that the narcotic species of *Banisteriopsis* bear different vernacular names. In the northwestern Amazon of Brazil and in adjacent parts of Colombia, it is termed *caapi*; in Amazonian Bolivia, Peru and Ecuador, *ayahuasca*; along the eastern foothills of the Andes in Colombia and Ecuador, it is *yajé*.

For some unexplained reason, writers usually have assumed that *ayahuasca* and *caapi* refer to *Banisteriopsis* but that *yajé* refers to *Prestonia amazonica*, notwithstanding the fact that this apocynaceous species is not known in the region where *yajé* is prepared.

It was apparently the anthropologist, Reinberg, who, in 1921, first suggested that in Peru the source of *ayahuasca* and of *yajé* were different plants. He suggested tentatively that *yajé* might be *Prestonia* or a related genus. The following year, the Belgian horticulturist, Claes, said that the *yajé* of the Koregwahes of Colombia "might be" *Prestonia amazonica*. I have found no voucher specimens of Reinberg or of Claes' collections, but the pharmacologists Michiels and Clinquart, who worked on Claes' material, reported that it seemed to belong to *Prestonia amazonica*.

Another and an unnecessary complication arose when the Colombian chemist, Fischer, while admitting that no botanical identification of his material had been made, referred *yajé* to *Aristolochia*; and the French pharmacologist, Rouhier, at first accepted this determination. Later, however, Rouhier

THE PSYCHEDELIC REVIEW

pointed out the similarity of the narcosis from ayahuasca and doubted the possibility that yajé could be *Prestonia amazonica*.

At about the same time, Barriga-Villalba and Albarracín, a Colombian chemist and pharmacologist, respectively, described yajé, on which they worked, as a "climbing shrub."

In 1927, two French pharmacologists, Perrot and Hamet, published an extensive review of what was then known botanically and chemically of this complex of intoxicants. Botanically, they pointed out that 1) yajé, ayahuasca and caapi referred to one species of plant — *Banisteriopsis Caapi* and that 2) no apocynaceous species is at all concerned with this narcotic complex.

In reply to Perrot and Hamet, the German botanist, Niedenzu, published several observations made from herbarium material. His specimens, of course, are no longer extant, for they were burned in the Berlin-Dahlem Botanical Garden during the last war, but his observations bear the stamp of authority, since Niedenzu was the outstanding specialist in the *Malpighiaceae*. His studies indicated that ayahuasca in Peru and Ecuador ought to be considered *Mascagnia psilophylla* var. *antifebrilis*, *Banisteriopsis quitensis* and *B. Caapi*. This introduced into the puzzle another genus, *Mascagnia*, albeit one closely allied to *Banisteriopsis*.

Another attempt to make order out of chaos came in 1930, when the French botanist, Gagnepain, stated 1) that ayahuasca was probably *Banisteriopsis Caapi*, but yajé could not be referable to this species; 2) that yajé seemed to approach *Prestonia amazonica*; 3) that material sent in from divergent regions by Reinberg and by Rivet seemed to represent the same malpighiaceae species. Gagnepain felt that yajé of Colombia was the same species as caapi of Brazil but that yajé of Ecuador was a different species of *Banisteriopsis*.

Hammerman, in 1929, basing his observations on the field studies of Varanof and Juzepczuk in Colombia, reported that Colombian yajé seemed to comprise several species of *Banisteriopsis*, though most of it was probably *B. quitensis*.

Perhaps the greatest single advance since Spruce's contribution occurred in 1931 when Morton described a new species of *Banisteriopsis* from southern Colombia, naming it *B. inebrians*. On the basis of meticulous field work and observations of the German plant explorer, Klug, Morton reported that at least three species are employed in this region: *Banisteriopsis Caapi*, *B. inebrians*, and *B. quitensis* and that *B. longialata* and *B. Rusbyana* may sometimes enter as additional ingredients.

During my 12 years of plant exploration in the Amazon Valley, I encountered ayahuasca, caapi and yajé and was able to partake of the hallucinogenic drink on a number of occasions with the natives. In all cases save one, the beverage was prepared with *Banisteriopsis*, regardless of the vernacular name that was employed for the drink.

Botanical Sources of the New World Narcotics

Along the eastern foothills of the Andes in Colombia, yajé is prepared as a concentrated decoction from day-long boiling of the rasped bark of *Banisteriopsis inebrians*. I saw no admixture with any other plant, yet the drink had a very strong psychotropic effect. Its intoxication had an initial stage of giddiness and nervousness, followed by profuse sweating and nausea. Then began a period of lassitude, during which a play of colors, at first mainly a hazy blue, increased in intensity. This eventually gave way to a deep sleep, interrupted by dreams and accompanied by a feverishness. No uncomfortable after-effects, save a severe diarrhea, were felt on the next day.

My studies indicate that the Kofán, Inga and Siona Indians of the Putumayo area do often employ the leaves of *Banisteriopsis Rusbyana*, known locally as *chagro-panga* or *oco-yajé*, as an admixture with the bark of *B. inebrians*. I collected *Banisteriopsis Rusbyana* several times, when natives pointed it out as the plant employed to make yajé stronger. The botanist, Cuatrecasas, has likewise found both species used together in the Putumayo.

Klug reported that these Indians "added to the yajé (*Banisteriopsis inebrians*) the leaves and young shoots of the branches of the *oco-yajé* or *chagro-panga* (No. 1971) (*B. Rusbyana*), and it is the addition of this plant which produces the 'bluish aureole' of their visions." The Colombian botanist, García-Barriga, noted their use of two admixtures, one of the amaranthaceous *Allenanthera Lehmannii*, the other an unidentified plant; he reported that the *Allenanthera*, when added to native beers or *chicha*, increased their intoxicating properties.

It is, I think, quite significant that the relatively intensive, though sporadic, botanical work in the Putumayo has not turned up *Prestonia* in connection with yajé. And I think we are justified in doubting that the yajé of this area is wholly or partly made from this apocynaceous vine. Nevertheless, we must not dismiss the possibility for other regions. There have been several serious intimations that *Prestonia* enters the narcotic complex. And, in 1957, the chemists Hochstein and Paradies analyzed ayahuasca from Peru, calling it *Banisteriopsis Caapi*, and, from the same region, yajé which they attributed to *Prestonia amazonica*. I have been unable to check the voucher herbarium specimens upon which, apparently, the Peruvian botanist, Ferreyra, made his determination. These chemists stated that the natives of the Rio Napo "commonly consume a mixed extract of the *B. Caapi* and *P. amazonica* leaves in the belief that the latter suppress the more unpleasant hallucinations associated with the pure *B. Caapi* extracts."

Much of my field work was done in the eastern part of the Colombian Amazon, near Brazil. Here *Banisteriopsis Caapi* is usually used alone, but sometimes the leaves of *B. Rusbyana* are added. I noted a few reports of admixtures, such as powdered tobacco or dried tobacco leaves and the crushed leaves of an apocynaceous tree, the toxic *Malouetia Tamaquarina*. The drink is invariably prepared as a cold water infusion in this region.

As far as I was able to judge from six or seven experiences with caapi, the effects differ little from those from the boiled concoction used in the

THE PSYCHEDELIC REVIEW

Putumayo. The intoxication is longer in setting in, and much more of the drink must be taken, but the symptoms of the intoxication and their intensity seem to me to be very similar.

It was my good fortune in 1948 to be able to witness the preparation and to partake of a narcotic caapi-drink amongst the nomadic Makus of the Rio Tikié near the Colombian boundary in Brazil. This is the same area in which Spruce worked a century ago. From the bark of a forest liana, a definitely hallucinogenic drink in the form of a cold water infusion, yellowish in hue and exceedingly bitter, is made. The liana represented an undescribed species of the malpighiaceae genus *Tetrapterys*, which I named *T. methystica*.

In summary, we may state that: a) the narcotic known in the western Amazon as *caapi*, *yajé* and *ayahuasca* is made basically from species of *Banisteriopsis* or from closely related malpighiaceae genera; b) the most widely employed species of *Banisteriopsis* are *B. Caapi*, *B. inebrians* and *B. Rusbyana*, but *B. quitensis* appears also to be a major source; c) the genus *Tetrapterys* is employed along the Colombia-Brazilian boundary, where only one species, *T. methystica*, is known to be used; d) *Mascagnia psilophylla* var. *antifebrilis* has been suggested as a source of ayahuasca, but the evidence is not strong; e) the identification of *yajé* as an *Aristolochia* is without foundation; f) *Prestonia amazonica* has frequently been named as a source of *yajé*; but there is little or no reliable evidence that it is ever employed, at least, as the prime ingredient, in preparing the narcotic; g) non-malpighiaceae plants are known occasionally, but apparently not frequently, to be added as admixtures together with *Banisteriopsis*.

If there be confusion in the botanical field, there is chaos in the chemical. This stems in great part, to be sure, from uncertainty as to precisely what the plants involved may be. The problem consequently is basically an ethnobotanical one.

An alkaloid was isolated from *yajé* in 1923 by Fischer who named it telepathine, but he gave neither structure nor other pertinent data. At the same time, Barriga-Villalba and Albarracín reported two alkaloids from specimens of *yajé*: *yajeine* and *yajeinine*. Later, in 1926, Michiels and Clinquart isolated *yajeine*; and Reutter reported *yajeine* and *yajeinine* from samples of *yajé* which, without herbarium specimens, he identified as *Prestonia amazonica*. In 1928, Lewin isolated what he called *banisterine*; this alkaloid, incidentally, was tried clinically in mental cases at that time.

In the same year, Wolfes, as well as Rumpf and Elger, claimed that both *yajeine* and *banisterine* were actually *harmine*, one of the indole derivatives found in the seeds and roots of *Peganum Harmala* of the family *Zygophyllaceae*. This point of view has been generally accepted. Although pharmacological similarities between the activity of these alkaloids and *harmine* are close, Hamet, while agreeing that telepathine, *yajeine* and *banisterine* are identical, felt that evidence was not yet sufficient to identify them with *harmine*.

Working, so far as I am aware, for the first time with accurately identified

Botanical Sources of the New World Narcotics

botanical materials, Chen and Chen demonstrated that the alkaloid of *Banisteriopsis Caapi* is *harmine* and that telepathine, *yajeine*, and *banisterine* are superfluous synonyms.

Recent chemical investigation has, however, apparently reopened the whole question. In 1953, working with material of *Banisteriopsis inebrians* which I collected in the Colombian Putumayo, O'Connell and Lynn found *harmine* in the stems and, in the leaves, "an alkaloid which was partly identified as *harmine*." Mors and Zaltzman, however, in 1954, questioned that *harmine* and *yajeine* were the same. Most recently, in 1957, Hochstein and Paradies, likewise on the basis of botanically determined materials, found that *Banisteriopsis Caapi* contains, in addition to *harmine*, the alkaloids *harmaline* and *d-tetrahydroharmine*, the three differing only in their state of oxidation and therefore of considerable biogenetic interest. They conclude that "in view of the low degree of psychotomimetic activity reported for *harmine* and the effectiveness ascribed to *B. Caapi* extracts, it seems likely that the *harmaline* or *d-tetrahydroharmine* may have substantial psychotomimetic activity in their own right."

This is how far 100 years has brought us. How much farther is there to go? Should we not step up the speed of our studies before time blots out much of the native lore of the western Amazon?

Datura and Other Solanaceous Plants

The well known intoxicating solanaceous genus, *Datura*, has two New World centers of aboriginal use. In the American Southwest (California, Arizona, New Mexico) and adjacent Mexico, several herbaceous species, chiefly *D. meteloides* and *D. innoxia* (the *toloache* of Mexico), have been a part of religious and magical rites from earliest times. They are still so employed. *Toloache*, reported as a narcotic by all of the early chronicles, is still widely employed in rural parts of northern and central Mexico.

In the Andes, from Colombia to Chile, and along the Pacific Coast of South America, where the *Daturas* are trees, a number of species are known to have been of extreme importance in some of the ancient civilizations, including the Incas and Chibchas, and are still valued in magico-religious and divinatory rites in isolated areas of Colombia, Ecuador and Peru. There is even a report of witch-doctors of the Ecuadorian highlands taking lessons recently from Jivaro medicine-men and re-introducing the use of *Datura* into the populous and now civilized Andean tribes. The important economic species are *Datura candida*, *D. sanguinea*, *D. aurea*, *D. dolichocarpa*, *D. suaveolens* and *D. arborea*. A recently discovered species, *Datura vulcanicola*, may also have been used.

The preparation and use of *Datura* differ widely. It is most generally taken in the form of pulverized seeds dropped into beverages such as *chicha* or native beers. Many South American Indians thus bring on the intoxication which is marked by an initial state of violence so furious that the partaker must be held down pending the arrival of the deep, disturbed sleep during

which visual hallucinations, interpreted as spirit visitations, are experienced. This narcosis enables the witch-doctor to diagnose disease, to discover thieves and to prophesy the outcome of tribal affairs and hopes. The Jivaro value *Datura* in correcting very refractory children who are given the seeds in the hope that the spirits of their forefathers may come to admonish them. The Chibchas anciently gave women and slaves potions of *Datura* to induce stupor prior to their being buried alive with departed husbands or masters.

Accurate identification of the species used by the tribes for special purposes leaves much to be desired, but since most species are known to contain similar alkaloids — *hyoscyamine*, *scopolamine*, *atropine* — this is not such a serious problem as it is in the case of some other narcotics.

In one high mountain-girt valley in southern Colombia, inhabited by Kzmsá and Ingano Indians, I collected in 1942 what, after 13 years of field and herbarium study, I decided was a new solanaceous genus, closely akin to the tree-Daturas. Apparently a strict endemic, this tree has 12-inch flowers and long slender leaves from which an infusion is made for use similar to that of the *Datura* species. *Methysticodendron Amesianum*, for that is what I called it, is stated to be more potent and more dangerous than the Daturas. Its chemical composition includes 1-scopolamine and hyoscyamine, with evidence of the presence of very minor amounts of other alkaloids.

The Indians of this isolated Valley of Sibundoy may possess the most intricate narcotic consciousness of any peoples of the New World. In addition to several species of tree-Daturas and *Methysticodendron*, they recognize and keep through vegetative reproduction clones of Daturas which are variously atrophied as a result of virus infection. Some of these "races" are such monstrosities that it is difficult to discover the species to which they belong. The natives have special names for each clone. Since they are reputedly stronger, weaker, or in other ways different from healthy Daturas in their effects, they are conserved for very special uses by the witch-doctors. Here is an excellent problem never investigated but well worthy of research — are they really chemically different and, if so, is the difference associated with the virus infection?

The alkaloidal family *Solanaceae* is so excessively rich in genera and species in the Andean area that there would seem to be every probability that additional plants of the family may be found to be or to have been utilized as native narcotics. Only further field research will tell.

Mescal Beans

In Texas and other southwestern states and in adjacent Mexico, one of the characteristic plants of the drier areas is the shrubby *Sophora secundiflora*. The pods of this leguminose species bear dark red seeds known locally as *mescal beans* or, in Mexico, as *frijolitos*.

The genus *Sophora* is rich in alkaloids. The seeds of *Sophora secundiflora* have been found to contain *cytisine*, known also as *sophorine*, a crystalline

alkaloid belonging pharmacologically to the same group as nicotine. *Cytisine* is highly poisonous. Its intoxication is characterized by nausea and convulsions, and death occurs as a result of respiratory failure.

In spite of its toxicity — or perhaps because of it — the seed of *Sophora secundiflora* was used formerly by Indian groups, especially in Texas and northern Mexico, as the basis for the Red Bean Dance. Various groups of the Plains Indians likewise employed the mescal bean in distinct patterns of use: as an oracular or divinatory medium, to induce visions in initiation rites and as a ceremonial emetic and stimulant. Its use today amongst the Kiowa and Comanche Indians as part of the ornamental dress of the leader of the peyote ceremony may point to its earlier employment as a narcotic, a role which it lost with the sweeping arrival of peyote which was so much safer and so much more spectacularly hallucinogenic.

References to the mescal beans go back to 1539, when Cabeza de Vaca spoke of them as objects of trade amongst the Indians of what is now Texas. They were mentioned in the mission literature of Texas as an oracular seed, and the Stephen Long Expedition in 1820 reported that the Arapaho and Iowa Indians used large red beans as a medicine and narcotic.

What interests us especially about *Sophora secundiflora* is how, in such a short period of time, its use has disappeared so completely that we have but a fragmentary knowledge of the whole picture. The same fate lies in store for other native narcotics, and it behooves us to act before aboriginal folklore be completely lost to us forever.

Ololiuqui and Tliltliltzen

The early chroniclers in Mexico, writing shortly after the Conquest, discovered a number of intoxicants as major factors in native religions. One of the strangest was *ololiuqui*, the seed of which was a vision-producing narcotic. Several sources described the plant as a vine and illustrated it. Hernandez, the King of Spain's personal physician who spent a number of years studying the medicinal plants, animals and stones of the new country, accurately illustrated *ololiuqui* as a morning glory in his work which was not published until 1651.

Religious persecution of the native cults by the newly arrived Roman Catholic authorities drove the use of the sacred narcotic plants into hiding. For four centuries, no morning glory with intoxicating principles ever came to light. In spite of the insistence of reliable Mexican botanists in the literature that *ololiuqui* actually was a member of the *Convolvulaceae*, the American economic botanist Safford asserted that it must be a species of *Datura*. He reasoned that 1) no morning glory was known to contain principles active on the central nervous system; 2) the flowers of the morning glories were tubular and similar to those of *Datura* and the Indians could have fooled Hernandez with a substitution; and 3) the narcosis described in the literature for *ololiuqui* coincided well with *Datura*-intoxication. Safford's identification

THE PSYCHEDELIC REVIEW

was readily accepted and, to this day, is well established in the scientific literature.

Nothing could have been further from the truth. In 1938, in the hills of Oaxaca, I found a convolvulaceous vine growing in the door-yard of a *curandero*. The seeds were employed as a sacred divinatory narcotic. As had been pointed out by Mexican botanists without the aid of voucher specimens, it was referable to the white-flowered morning glory, *Rivea corymbosa*. The few seeds available were examined by Santesson in Sweden who reported that in frogs they induced a kind of "half-narcosis" and who suggested that perhaps the active principle might be an alkaloid linked with a glucoside.

In 1941, I published a modest survey of our knowledge of the ololiuqui plant, but nothing further was done until a Canadian psychiatrist, Osmond, became interested in the effects described for the narcotic. In 1955, he reported four experiments with ololiuqui, characterizing *Rivea*-intoxication as consisting of apathy and anergia together with heightened visual perception and increased hypnagogic phenomena. He found no mental confusion but instead an acute awareness combined with alteration of time perception, followed a few hours later by a period of calm, alert euphoria. We might well harken back at this point to Hernandez' statement that Aztec "priests communed with their gods . . . to receive a message from them, eating the seeds to induce a delirium when a thousand visions and satanic hallucinations appeared to them." It was so powerful that he wrote ". . . it will not be wrong to refrain from telling where it grows, for it matters little that this plant be here described or that Spaniards be made acquainted with it."

Recently, Wasson has established that the seeds of another morning glory, *Ipomoea violacea*, are employed in Oaxaca for the same purpose and in the same way as those of *Rivea corymbosa*; he has identified *Ipomoea violacea* as the *tlitliltzen* of the Aztecs.

For many years, chemists were unable to isolate any narcotic principle which could cause the characteristic intoxication, but in 1960, Hofmann was able to find the active constituents. They are the amides of lysergic acid and of d-lysergic acid, chanoclavine and clymoclavine, substances hitherto known only in the fungus ergot (*Claviceps purpurea*). They have been found in *Rivea corymbosa* as well as in *Ipomoea violacea*.

Peyote

Another of the sacred plants closely tied in with religious practices which the conquerors of Mexico encountered was the now famous *peyote* cactus, *Lophophora Williamsii*. The spineless heads of this small gray-green cactus with a long carrot-like root are sliced off and dried to form the so-called *mescal buttons*. The intoxication induced by eating mescal buttons is one of the most highly complex known and has been too often and expertly described in the literature to detail here. The most spectacular phase of this intoxication is made up of the kaleidoscopic play of richly colored visual

Botanical Sources of the New World Narcotics

hallucinations. It is primarily this extraordinary phase of the narcosis which has convinced Mexican and North American Indians that the plant is a divine messenger enabling the partaker to communicate with the gods without the medium of a priest and has occupied the serious attention of experimental psychologists now for a number of years.

Peyote goes back far in Mexican history. The chronicles of the Conquistadores are full of fanatic and vituperative condemnation of peyote as a diabolic root. Missionaries combated its use in native religions as a sacred element and compared the eating of the cactus with cannibalism.

Peyote survived, however, as a divine therapeutic agent and religious hallucinogen in northern Mexico, where the explorer Lumboltz in 1892 discovered its use in ceremonial dances amongst the Huichols and Tarahumares and sent back to Harvard University material upon which a definitive botanical determination was made.

During the last half of the past century, Indian tribes from the United States brought back knowledge of the peyote from their raids into northern Mexico. After 1880, peyote was accepted with great speed amongst many tribes in the United States as the central sacrament in a religious cult which incorporated both Christian and aboriginal elements. By 1922, the adherents to the peyote cult numbered some 13,300 and, for protection against fierce and often unjust persecution from missionary and political circles, it was legally incorporated as the Native American Church. There are now many more tribes, as far north as Saskatchewan, represented in the peyote cult in the United States and Canada; the figure has been put as high as a quarter of a million. Having attended peyote ceremonies in Oklahoma, I must say that I am impressed with the reverence and seriousness of the Indian in his practice of the peyote ceremony, the moral teachings of which are of the highest. Since science has not demonstrated that peyote is a dangerous and addictive narcotic, I personally can see no reason for political interference with its use in the American Indian religious rites.

There are some eight isoquinoline alkaloids in the peyote cactus. While all of them undoubtedly contribute to the characteristic peyote intoxication, one — *mescaline* — is responsible for the fantastic visual hallucinations.

So much has been written on the various aspects of peyote that I need not elaborate in this brief survey. What should concern us, however, is the advisability of intensive chemical and pharmacological investigations of the *Cactaceae*, especially of those genera allied to *Lophophora*. Alkaloids similar to or identical with those of *Lophophora* have been found in species of *Anhalonium* and *Ariocarpus*, but there seems never to have been carried out a concerted screening of the family. Of the more than twenty plants which, in Mexico, have been called "peyote," either because their physiological effects are similar or because they are used with *Lophophora Williamsii*, more than half belong to the *Cactaceae*. Here is one area, I believe, where the attention of chemists and pharmacologists is strongly indicated.

THE PSYCHEDELIC REVIEW

Rapé dos Indios

In the central part of the Brazilian Amazon, along the upper Xingú, to be precise, a psychotomimetic snuff has recently been discovered. It is known in Portuguese only by the name *rapé dos indios* or "Indian snuff." Nothing has as yet been published. My source of information was the late Dr. George A. Black, botanical explorer of the Brazilian Amazon, where he lost his life in a rapids. Black informed me in a letter that this snuff is made from the fruit of the gigantic forest tree, *Olmedioperebea sclerophylla*, a member of the *Moraceae*. One could hardly have chosen a less likely source-family for an hallucinogen. Unfortunately, we have no information about its manner of use, and no chemical study has, to my knowledge, been carried out, so that we do not know anything as yet as to the nature of the active principle.

Salvia and Other Mints

A species of *Salvia*, of the Labiatae or Mint Family, has very recently been discovered by Wasson as an hallucinogenic narcotic in use in northeastern Oaxaca, Mexico. The species, *Salvia divinorum*, new to science, has the vernacular names *hojas de la pastora* or *hojas de María Pastora* in Spanish and *ska-Pastora* among the Mazatec Indians.

Although the plant and its properties are familiar to virtually all Mazatecs, there seem to have been no very early reports of the use of *Salvia divinorum* in magico-religious rites. Its area of diffusion comprises only the Mazatec country and possibly adjacent regions inhabited by Cuicatec and Chinantec Indians. The leaves are consumed, usually by chewing them directly, but the effects may be induced when the leaves are drunk in water after having been crushed. *Salvia* leaves are taken when the mushrooms are not available, their narcotic effects coming on quicker, but, while these are similar to the effects of the mushrooms, they are "less sweeping" and of shorter duration. The psychotomimetic properties have been adequately experienced in the field of Wasson and others in his party.

Wasson has recently identified *Salvia divinorum* as probably the *pipiltzintzintli* of the Aztecs.

The chemical constituent or constituents responsible for the narcotic effects of *Salvia divinorum* have not yet been determined. As a mint, of course, the plant would normally be rich in essential oils.

Coleus pumila and two "forms" of *C. Blumei*, both of the Mint Family and both species of Old World origin, have been pointed out by natives in the Mazatec country to be likewise psychotropic, but these lack field corroboration by critical researchers. As Wasson has stated, "it would seem . . . that we are on the threshold of the discovery of a complex of psychotropic plants in the Labiatae or Mint Family."

Botanical Sources of the New World Narcotics

Teonanacate (teonanacatl)

The Spaniards, like most Europeans, are mycophobes — that is to say, they have an innate dislike of mushrooms. At the time of Spain's great expansion into the New World, they were fired by a religious fanaticism the like of which has never been seen since. We can, consequently, understand the utter disgust of the conquerors of Mexico when they discovered certain intoxicating mushrooms called *teonanacatl*, "flesh of the gods," employed as a kind of sacrament or communion in Aztec religious rites.

Most of the early chroniclers were clerics, and they put special emphasis on the need for stamping out such loathsome pagan customs. The peyote cactus and the morning glory, *ololiuqui*, fell under their ban, too, but particular wrath was directed towards the mushrooms which, through the visions induced by the sacred powers residing in the plant, permitted the Indian to commune with the spirit world.

Sahagún, a Spanish friar, was one of the first Europeans to refer to *teonanacate*. He made several references to mushrooms "which are harmful and intoxicate like wine" so that those who eat of them "see visions, feel a faintness of heart and are provoked to lust." He detailed the effects in one reference, saying that the natives ate them with honey and "when they begin to be excited by them start dancing, singing, weeping." "Some," Sahagún continued, "do not want to sing but sit down . . . and see themselves dying in a vision; others see themselves being eaten by a wild beast; others imagine that they are capturing prisoners of war, that they are rich, that they possess many slaves, that they had committed adultery and were to have their heads crushed for the offence . . . and when the drunken state had passed, they talk over amongst themselves the visions which they have seen." In addition to the detailed reports, several editions of Sahagún's writing give crude illustrations of the sundry mushrooms employed.

There are four or five references to the sacred fungi in these early writings. According to Tezozomoc, for example, inebriating mushrooms were part of the coronation feast of Montezuma in 1502. Friar Motolinia, who died in 1569, mentioned the sacred psychotomimetic mushrooms in a work on pagan rites and idolatries. The physician, Hernandez, who studied the medicinal lore of Mexican natives for seven years, spoke of three kinds of mushrooms used as narcotics and worshiped. Of some, called *teyhuinti*, he wrote that they "cause not death but madness that on occasion is lasting, of which the symptom is a kind of uncontrolled laughter . . . these are deep yellow, acrid and of a not displeasing freshness. There are others again which, without inducing laughter, bring before the eyes all kinds of things, such as wars and the likeness of demons. Yet others there are not less desired by princes for their festivals and banquets, and these fetch a high price. With night-long vigils are they sought, awesome and terrifying. This kind is tawny and somewhat acrid."

Notwithstanding the relatively numerous and forceful Spanish reports,

nothing was known about these mushrooms until very recently. The first attempt to determine them botanically was made in 1915, when the American botanist, Safford, asserted that teonanacate was, in reality, only the peyote cactus. The dried, brown, discoidal head or "button" of *Lophophora Williamsii*, he wrote, resembled "a dried mushroom so remarkably that, at first glance, it will even deceive a mycologist." Safford was led into this serious error first by his oft-stated belief that the Mexican Indians were deficient in botanical knowledge and secondly by the similarity of the effects of peyote and teonanacate. Safford's outstanding reputation stamped his conclusions with authority, and they became generally accepted.

Dr. Blas P. Reko, a physician who did extensive botanical collecting in Mexico, raised a lone voice in protest and, though he failed to produce specimens, wrote, as early as 1919 and 1923, that teonanacate in reality was a dung-fungus and was still employed in religious rites in Oaxaca.

In 1936, an engineer, Robert J. Weitlaner of Mexico City, secured a few specimens of a mushroom used in ceremonial divination in northeastern Oaxaca and sent them to the Harvard Botanical Museum. They were poorly preserved but it was possible to assign them to the genus *Panaeolus*. In 1938 and 1939, during the course of ethnobotanical field work in Oaxaca in the company of Reko, I collected *Panaeolus sphinctrinus* as one of the narcotic mushrooms employed by the Mazatec Indians of Huautla de Jiménez. During the same field studies, a specimen of *Stropharia cubensis* was likewise collected as one of the psychotomimetic mushrooms. In the time available, I was unable to witness a ceremony, and so few mushrooms were available because of the very dry season that it was not possible for me to take them experimentally: all were needed as voucher herbarium specimens.

I was able to publish two papers in which I suggested that *Panaeolus sphinctrinus* (*P. campanulatus* var. *sphinctrinus*) was probably the teonanacate or sacred mushroom of the Aztecs, and my work then took me to the Amazon Valley for twelve years, so that I never returned to Oaxaca to continue the research.

About fifteen years later, Mr. R. Gordon Wasson of New York and his wife, intensely interested amateur ethnomycologists, read my papers and decided to visit Oaxaca to pursue this fascinating phase of their life-long study of mushrooms. Their first trip was made in 1953. It has been followed by seven or eight expeditions to Oaxaca and other parts of Mexico. Wasson sensed the need for intensive study of all phases of the use of the sacred mushrooms, so he enlisted the collaboration of specialists. The resulting research, woven by Wasson into an intricately interrelated whole, will long hold a high place as an outstanding model of what can be accomplished by well planned and carefully executed ethnobotanical investigation. Amongst his collaborators, he numbers the French mycologist, Dr. Roger Heim, and the Sandoz pharmaceutical scientists under Hofmann. Wasson and his associates were able to witness and to take part in mushroom ceremonies and to eat of the mushrooms themselves.

The work of the Wassons and Heim has indicated that a number of different species of *Basidiomycetes* are employed as sacred, psychotomimetic mushrooms in Mexico. This was expected, in view of the ancient chronicles, but the wealth of genera and species still used — and probably not all have been uncovered as yet — is unexpectedly great. Furthermore, a large percentage of those employed represent species new to science.

Wasson and Heim failed to find *Panaeolus* employed by their informants, but it must be remembered that different *curanderas* may use different mushrooms and that the purpose for which the intoxicant is taken in a given ritual or séance may likewise have a part in choice of the species. The following mushrooms make up the Wasson-Heim list of Mexican hallucinogens: *Cantharellaceae-Conocybe siliginoides*, growing on dead tree trunks; *Strophariaceae-Psilocybe mexicana*, a small tawny inhabitant of wet pastures, apparently the most highly prized by the users; *Psilocybe astecorum*, called "children of the waters" by the Aztecs; *Psilocybe zapotecorum* of marshy ground and known by the Zapotecs as "crown of thorns mushroom"; *Psilocybe caerulescens* var. *mazatecorum*, the so-called "landslide mushroom" which grows on decaying sugar cane refuse; *Psilocybe caerulescens* var. *nigripes*, that has a native name meaning "mushroom of superior reason"; and *Stropharia cubensis*.

The interest stirred up in the scientific world by this work encouraged others to enter the field, but due primarily to the rapid nature of their work as compared to the sustained investigations of the Wasson group, they have contributed little to the total picture. The principal additions have been made by Singer and Guzman who, in 1957, visited Oaxaca and found several other species of *Psilocybe* used.

Undoubtedly there were many tribes in ancient Mexico who employed teonanacate, but we know with certainty only of the Chichimecas, who spoke Nahuatl. We know that today the sacred mushrooms are consumed by the Mazatecs, Chinantecs, Chatinos, Zapotecs, Mixtecs, and Mijes, all of Oaxaca; by the Nahoas of Mexico; and possibly by the Tarascans of Michoacan and the Otomis of Puebla.

The Wassons have uncovered much indirect evidence which they have interpreted, correctly I believe, to indicate a very great extent for the use of psychotropic mushrooms in Mexico and Guatemala, as well as an astonishing age for the mushroom cults. Certain frescoes from central Mexico, for example, dating back to 300 A.D., have designs which seem to put mushroom worship back that far. There are likewise the archaeological artifacts now called "mushroom stones" from the highland Maya of Guatemala, going back to 1000 B.C. Consisting of an upright stem with a man-like figure crowned with an umbrella-shaped top, these stone carvings have long baffled archaeologists who supposed them to be phallic symbols. It is now rather clear that they represented a kind of icon connected with mushroom worship.

The most important of the narcotic mushrooms of Oaxaca is *Psilocybe mexicana*. Besides the kaleidoscopic play of visual hallucinations in color,

THE PSYCHEDELIC REVIEW

the outstanding symptoms of *Psilocybe*-intoxication are: muscular relaxation, flaccidity and mydriasis early in the narcosis, followed by a period of emotional disturbances such as extreme hilarity and difficulty in concentration. It is at this point that the visual and auditory hallucinations appear, eventually to be followed by lassitude and mental and physical depression, with serious alteration of time and space perception. One peculiarity of the narcosis which promises to be of interest in experimental psychiatry is the isolation of the subject from the world around him — that is, without a loss of consciousness, he is rendered completely indifferent to his environment which becomes unreal to him as his dreamlike state becomes real.

Heim and his colleague Cailleux succeeded in growing cultures of *Psilocybe mexicana* and other species. This opened the way for chemical study of the fungus in the Sandoz laboratories in Switzerland. Hofmann and his group there isolated white crystals which were soluble in water and methanol but almost insoluble in usual organic solvents. They called the substance *psilocybine* and found that it had an unusual chemical structure which research indicated to be an acidic phosphoric acid ester of 4-hydroxydimethyl-tryptamine. It is, therefore, allied to other naturally occurring compounds such as *bufotenine* and *serotonin*. *Psilocybine* is the first known naturally occurring indole derivative containing phosphorus. The discovery of such a substance has implications of great import, for example, for the study of biogenesis of the ergot alkaloids and for many other aspects of chemical investigation of the psychotropic indole alkaloids such as *harmine* and *reserpine*.

Psilocybe mexicana contains another indolic compound in minute amounts which, while closely allied to *psilocybine* is apparently not stable and has not yet been crystallized. It is called *psilocine*.

Since reporting on his preliminary work with *Psilocybe mexicana*, Hofmann has discovered *psilocybine* in other psychotomimetic species of this genus and in *Stropharia cubensis*. And I have heard unofficially that the same compound is suspected to occur in the genus *Panaeolus*.

Psilocybine is now under clinical examination as an aid in experimental psychiatry and in therapy, and promises to be as fruitful perhaps as *lysergic acid* has been.

Vinho de Jurumena

Another little known South American intoxicant is a beverage called *vinho de Jurumena*, prepared from the seeds of the leguminose *Mimosa hostilis*. Identification of this narcotic drink, employed by the Pancarú Indians in Pernambuco, Brazil, was made by Gonçalves de Lima, who described its role in the magico-religious ceremonies of this tribe. It is an hallucinogen and is believed to transport the soul to the spirit world.

The isolation of an alkaloid called *nigerine* was reported in 1946, but work completed last year indicates that *nigerine* is, in reality, N,N-dimethyl-

Botanical Sources of the New World Narcotics

tryptamine, the same constituent found in species of the closely related genus *Piptadenia*.

Yakee or Paricá

At the beginning of this century, the German ethnologist, Koch-Grünberg, mentioned an intoxicating snuff prepared from the bark of an unidentified tree by the Yekwana Indians of the headwaters of the Orinoco in Venezuela. There is every probability that this snuff was prepared from trees of the genus *Virola* of the *Myristicaceae*, the family to which our nutmeg belongs.

During my ethnobotanical field work in the Colombian Amazon, I learned of a particularly intoxicating snuff used only by the witch-doctors in several tribes. This was the *yakee* or *parica*. After eight years of search, I discovered that *yakee* was prepared from several species of *Virola*, *V. calophylla*, *V. calophylloidea* and, perhaps, *V. elongata*. The natives strip bark from the trunks before the sun has risen high enough to heat up the forest. A blood-red resin oozes from the inner surface of the bark. It is scraped off with a machete or knife and boiled in an earthen pot for hours until a thick paste is left. This paste is allowed to dry and is then pulverized, sifted through a fine cloth, and finally added to an equal amount of ashes of the stems of a wild cacao species. The ashes give the snuff consistency to withstand the excessive dampness of the air which might otherwise quickly "melt" the powdered resin-paste to a solid lump.

The active principle is undoubtedly the same essential oil — *myristicine* — that is common throughout the family and that makes our household nutmeg a dangerous narcotic when used in the appropriate amounts. Work on samples brought from the Colombian Amazon has not yet been completed. In the ethnological literature, *yakee* snuff has been consistently confused with both tobacco and yopo snuffs, so that it is difficult to get a clear picture from the literature of the extent of use of these three narcotics. We may say, however, that *yakee* is employed by tribes in the Colombian Vaupés and in the Orinoco drainage basin and in the upper Rio Negro basin in Brazil; if we are correct in ascribing the "bark snuff" reported by Koch-Grünberg to *Virola*, we should then include the headwaters of the Orinoco in Venezuela.

It may be interesting to append a few observations which I made personally after taking *yakee*. I took about one-third of a teaspoonful in two inhalations, using the characteristic V-shaped bird-bone snuffing tube. This represents about one-quarter the dose that a diagnosing medicine man will take to bring on an eventual state of unconsciousness.

The dose was snuffed at five o'clock one afternoon. Within fifteen minutes, a drawing sensation was felt over the eyes, followed very shortly by a strong tingling in fingers and toes. The drawing sensation in the forehead gave way to a strong and constant headache. Within a half hour, the feet and hands were numb and sensitivity of the fingertips had disappeared; walking was possible with difficulty, as with *beri-beri*. I felt nauseated until eight o'clock, and experienced lassitude and uneasiness. Shortly after eight, I lay

THE PSYCHEDELIC REVIEW

down in my hammock, overcome with a drowsiness, which, however, seemed to be accompanied by a muscular excitation except in the hands and feet. At about nine-thirty, I fell into a fitful sleep which continued, with frequent awakenings, until morning. The strong headache lasted until noon. A profuse sweating and what was probably a slight fever persisted throughout the night. The pupils were strongly dilated during the first few hours of the intoxication.

Though performed under primitive conditions in the jungle by myself, this experiment does, I think, indicate the great strength of the snuff as a psychotic agent. The witch-doctors see visions in color, but I was able to experience neither visual hallucinations nor color sensations. The large dose used by the witch-doctor is enough to put him into a deep but disturbed sleep, during which he sees visions and has dreams which, through the wild shouts emitted in his delirium, are interpreted by an assistant. That it is a dangerous practice is acknowledged by the witch-doctors themselves. They report the death, about 15 years ago, of one of their number from the Puinave tribe during a yakee-intoxication.

Yopo and Huilca

The snuffing of narcotics is widespread in aboriginal America, especially in South America. A number of different narcotics are involved, and there is still much to do to clarify all aspects of their botanical identity.

The most widely employed snuff, of course, is tobacco. From records in the literature, it is not always possible to distinguish when snuff is made from tobacco or from other plants, and this has caused much confusion.

The first scientific report concerning *yopo* or snuff from the leguminose *Piptadenia* is apparently that of Humboldt who, in 1801, saw the Otomacs along the Orinoco pulverize the seed of *Piptadenia peregrina*, mix the powder with quicklime and use it like tobacco snuff. Spruce gave us the earliest detailed report, however, when he wrote about *niopo* amongst the Guahibos of the Orinoco of Colombia.

The principal area of use of the *Piptadenia peregrina* snuff seems to be the Orinoco basin and Trinidad. Safford has identified the cohoba snuff of ancient Hispaniola as *Piptadenia peregrina*, and he seems to have good, even though indirect, evidence.

As practiced today in the Orinoco basin of Colombia and Venezuela, *yopo*-snuffing is a dangerous habit carried on, not by witch-doctors alone, but the whole population — men, women, children. The frightening intoxication first produces convulsive movements and distortions of the face and body muscles, then a desire to dance which is rapidly overwhelmed by an inability to control the limbs; it is at this point that a violent madness or a deep sleep disturbed by a nightmare of frightening sights takes over. The intoxication always ends in a long stupor. The use of *yopo* in daily life in the *llanos* area of Colombia and Venezuela may be relatively recent, for it was anciently employed only for specific purposes, such as to induce bravery before a battle,

Botanical Sources of the New World Narcotics

to give hunters keener sight and as an agent for prophesying, clairvoyance and divination.

Recent chemical work on carefully identified material has shown that the major alkaloid of a number of species of *Piptadenia* is *bufotenine*. Present also may be another hallucinogenic alkaloid, *N,N*-dimethyltryptamine. *Piptadenia colubrina*, a species closely allied to *P. peregrina*, has up to 2.1 percent of *bufotenine*.

Another species of *Piptadenia*, *P. macrocarpa*, is the source of a snuff of the Andean regions of Peru, where the plant is called *huilca*. Little of a definite nature seems to be known about *huilca* and its uses, but it is believed to have been the source of the strong, divinatory snuff of early Peru.

Coca

Although *coca*, the dried leaves of *Erythroxylon Coca*, does not constitute an hallucinogen, we should not terminate a discussion of South American narcotics without a mention, howsoever brief, of this very ancient drug. It belongs to Lewin's *Euphorica*, along with the opium poppy, *Papaver somniferum* of the Old World. I include these cursory remarks on *coca* merely because, by and large, it is, next to tobacco, America's most important narcotic and one which, even at this late date, deserves further study from many points of view. It is unquestionably, as employed by the Indians, one of the most maligned of narcotics.

There is no need to go into details which are easily available to all readers. The few lines which I shall devote to *coca*, the source of our *cocaine*, will discuss certain aspects not commonly found in the literature nor easily available to those who have not had personal experience in the field with the narcotic.

The chemical makeup of *coca* is extremely complex, with numerous alkaloids in six groups of the tropane series. The chemical literature usually attributes the source of *coca* to several species of *Erythroxylon*, but there seems to be little botanical reason for referring all of the slight geographical variants to different species. *Erythroxylon Coca* is a cultigen of long association with man, now unknown in the wild state and with a very wide altitudinal range.

Coca was a divine plant in pre-Colombian Andean cultures where it was once restricted to the priestly class but early escaped to the common man. Dried leaves have been found in Peruvian mummy bundles dating back at least 2000 years.

Coca chewing today is an integral part of the culture pattern in many isolated parts of the highlands of Colombia and in most highland parts of Peru, Bolivia and the northwesternmost corner of Argentina. Its use in highland Ecuador has all but died out. From the Andes, the habit spread into the lowland in most parts of the northwesternmost Amazon Valley in Colombia and Peru, where, however, it is employed in a rather different way. All highland groups chew the toasted leaves together with small pieces of lime or *lliptu*, of mineral, plant or animal origin. The Amazonian Indians pulverize

THE PSYCHEDELIC REVIEW

the toasted coca leaves and mix the green powder with finely sifted ashes from leaves of the *Cecropia* tree; the resulting gray-green powder is packed over the gums and is not actually chewed but allowed to dissolve slowly and trickle down to the stomach. Most Indian coca-users keep the cheeks full of the material throughout their waking hours.

What is very commonly overlooked or even purposely ignored in many governmental and sociological circles is the fact that coca, as chewed by the native, is not of necessity physically, socially and morally dangerous enough to warrant prohibitive laws. It has nothing in common with cocaine addiction, and coca-chewing apparently does not lead to addiction. Peruvian Indians conscripted for the army where coca is forbidden are not unduly bothered by the lack of the narcotic. For the greater part of eight of my twelve years in exploration of the northwest Amazon, I used coca daily and found no desire for it when, back in the capital city, I had no supply. It is perhaps roughly comparable to the use of tobacco in our culture, and is certainly much less of a problem in the Andes than is alcohol in a mechanized society such as ours in the United States. Unwise legal prohibitions in certain Andean areas, aimed at extirpation of the coca-custom, have invariably driven the Indian — deprived in his inhospitable, cold altitudes of the euphoric coca — to the dangerously poisonous, locally distilled, alcoholic drinks, with an attendant rapid rise in crime of every description. As Taylor has wisely summed it up: "If medicine and addiction were its only uses, no one would bother to read what follows. But neither the addicts nor most doctors, nor many others, realize that the birth of cocaine was tended by the gods, nurtured in the high purity of the Andes without a taint of depravity, and was, if not divine, so considered for countless centuries. Even today, it has the touch of the miraculous."

* * * *

This brief discussion of native American narcotics of plant origin comprises but a very superficial panoramic view of the work that has been done on the hallucinogenic drugs and which has opened up such vistas of promise in both practical and academic fields of medical and biological research.

I have wanted to emphasize the part that many apparently unrelated fields may take in such an interdisciplinary attack. And I trust that we have been able to point out very specifically the two most important methods for the discovery of new drugs — on the one hand, examination of ancient records and interpretation of folklore; on the other, field work amongst primitive peoples who still live in close association with the plant world.

Certainly none of us could have been ready to accept some of the fantastic reports of the early writers on the unearthly effects produced by the sacred mushrooms. Now we know that they are true. We can no longer afford to ignore reports of any aboriginal use of a plant merely because they seem to fall beyond the limit of our credence. To do so would be tantamount to the closing of a door, forever to entomb a peculiar kind of native knowledge which might lead us along paths of immeasurable progress.

Hermann Hesse:

Poet of the Interior Journey

TIMOTHY LEARY

and

RALPH METZNER

HERMANN HESSE was born in July, 1877, in the little Swabian town of Calw, the son of Protestant missionaries. His home background and education were pietistic, intellectual, classical. He entered a theological seminary at the age of fourteen with the intention of taking orders, and left two years later. In Basel he learned the book trade and made his living as a bookseller and editor of classical German literary texts. He became acquainted with Jacob Burckhardt, the great Swiss historian and philosopher, who later served as the model for the portrait of Father Jacobus in *The Bead Game*. In 1914 Hesse's "unpatriotic" anti-war attitude brought him official censure and newspaper attacks. Two months after the outbreak of the war, an essay entitled "O Freunde, nicht diese Töne" (O Friends, not these tones) was published in the *Neue Zürcher Zeitung*: it was an appeal to the youth of Germany, deploring the stampede to disaster.

In 1911 he travelled in India. From 1914 to 1919 he lived in Bern, working in the German embassy as an assistant for prisoners of war. A series of personal crises accompanied the external crisis of the war: his father died; his youngest son fell seriously ill; his

THE PSYCHEDELIC REVIEW

wife suffered a nervous breakdown and was hospitalized. In 1919, the year of the publication of *Demian*, he moved to the small village of Montagnola by the lake of Lugano and remained there till the end of his life. In 1923 he acquired Swiss citizenship, and in 1927 remarried. Hesse steeped himself in Indian and Chinese literature and philosophy, the latter particularly through the masterful translations of Chinese texts by Richard Wilhelm. In 1931 he remarried a third time and moved to another house in Montagnola which had been provided for him by his friend, H. C. Bodmer. In 1946 he was awarded the Nobel Prize; in 1962, at the age of 85, he died. Asked once what were the most important influences in his life, he said they were: "the Christian and completely non-nationalist spirit of my parents' home," the "reading of the great Chinese masters," and the figure of the historian Jacob Burckhardt.

Few writers have chronicled with such dispassionate lucidity and fearless honesty the progress of the soul through the stages of life. *Peter Camenzind* (1904), *Demian* (1919), *Siddhartha* (1922), *Steppenwolf* (1927), *Narziss und Goldmund* (1930), *Journey to the East* (1932), *Magister Ludi* (1943) — different versions of spiritual autobiography, different maps of the interior path. Each new step revises the picture of all the previous steps, each experience opens up new worlds of discovery in a constant effort to communicate the vision.

As John Cage is fond of reminding us, writing is one thing and reading is another. All writings, all authors are thoroughly misunderstood. Most wise men do not write because they know this. The wise man has penetrated through the verbal curtain, seen and known and felt the life-process. We owe him our gratitude when he remains with us and tries to induce us to share the joy.

The great writer is the wise man who feels compelled to translate the message into words. The message is, of course, around us and in us at all moments. Everything is a clue. Everything contains all the message. To pass it on in symbols is unnecessary but perhaps the greatest performance of man.

Wise men write (with deliberation) in the esoteric. It's the way of making a rose or a baby. The exoteric form is maya, the hallucinatory facade. The meaning is within. The greatness of a

Hermann Hesse: Poet of the Interior Journey

great book lies in the esoteric, the seed meaning concealed behind the net of symbols. All great writers write the same book, changing only the exoteric trappings of their time and tribe.

HERMANN HESSE IS ONE OF THE GREAT WRITERS of our time. He wrote *Finnegan's Wake* in several German versions. In addition to being a wise man, he could manipulate words well enough to win the Nobel Prize.

Most readers miss the message of Hesse. Entranced by the pretty dance of plot and theme, they overlook the seed message. Hesse is a trickster. Like nature in April, he dresses up his code in fancy plumage. The literary reader picks the fruit, eats quickly, and tosses the core to the ground. But the seed, the electrical message, the code is in the core.

Take *Siddhartha*¹ — the primer for young Bodhisattvas, written when Hesse was forty-five. Watch the old magician warming up to his work. We are introduced to a proud young man, strong, handsome, supple-limbed, graceful. *Siddhartha* is young and ambitious. He seeks to attain the greatest prize of all — enlightenment. Cosmic one-upmanship. He masters each of the other-worldly games. The Vedas. Asceticism. Matches his wits against the Buddha himself. Tantric worldly success. "We find consolations, we learn tricks with which we deceive ourselves, but the essential thing — the way — we do not find." "Wisdom is not communicable." "I can love a stone, Govinda, and a tree or a piece of bark. These are things and one can love things. But one cannot love words. . . . Nirvana is not a thing; there is only the word Nirvana." Then in the last pages of the book, Hermann Hesse, Nobel Prize novelist, uses words to describe the wonderful illumination of Govinda, who

no longer saw the face of his friend *Siddhartha*. Instead he saw other faces, many faces, a long series, a continuous stream of faces — hundreds, thousands, which all came and disappeared and yet all seemed to be there at the same time, which all continually changed and renewed themselves and which were yet all *Siddhartha*. He saw the face of a fish, of a carp, with tremendous painfully opened mouth, a dying fish with dimmed eyes. He saw the face of a newly born child, red and full of wrinkles, ready to cry. He saw the face of a murderer, saw him plunge a knife into the body of a man; at the same moment he saw this criminal kneeling down, bound, and his head cut off by an executioner. He saw the naked bodies of men and

THE PSYCHEDELIC REVIEW

women in the postures and transports of passionate love. He saw corpses stretched out, still, cold, empty. He saw the heads of animals, boars, crocodiles, elephants, oxen, birds. He saw Krishna and Agni. He saw all these forms and faces in a thousand relationships to each other, all helping each other, loving, hating and destroying each other and become newly born. Each one was mortal, a passionate, painful example of all that is transitory. Yet none of them died, they only changed, were always reborn, continually had a new face: only time stood between one face and another. And all these forms and faces rested, flowed, reproduced, swam past and merged into each other, and over them all there was continually something thin, unreal and yet existing, stretched across like thin glass or ice, like a transparent skin, shell, form or mask of water — and this mask was Siddhartha's smiling face which Govinda touched with his lips at that moment. And Govinda saw that this mask-like smile, this smile of unity over the flowing forms, this smile of simultaneousness over the thousands of births and deaths — this smile of Siddhartha — was exactly the same as the calm, delicate, impenetrable, perhaps gracious, perhaps mocking, wise, thousand-fold smile of Gotama, the Buddha, as he had perceived it with awe a hundred times. It was in such a manner, Govinda knew, that the Perfect One smiled.

Those who have taken one of the psychedelic drugs may recognize Govinda's vision as a classic LSD sequence. The direct visual confrontation with the unity of all men, the unity of life. That Hesse can write words such as "unity," "love," "Nirvana," is easily understood. Every Hindu textbook gives you the jargon. But his description of the visual details of the cosmic vision, the retinal specifics, is more impressive. Whence came to Hesse these concrete sensations? The similarity to the consciousness-expanding drug experience is startling. The specific, concrete "is-ness" of the illuminated moment usually escapes the abstract philosopher of mysticism. Did Hesse reach this visionary state himself? By meditation? Spontaneously? Did H.H. the novelist himself use the chemical path to enlightenment?

The answer to these questions is suggested in the next lesson of the master: *Steppenwolf*² — a novel of crisis, pain, conflict, torture — at least on the surface. Hesse writes in a letter: "If my life were not a dangerous painful experiment, if I did not constantly skirt the abyss and feel the void under my feet, my life would have no meaning and I would not have been able to write anything." Most readers sophisticated in psychodynamics recognize the drama pre-

Hermann Hesse: Poet of the Interior Journey

sented — the conflict between ego and id, between spirit and material civilization, the "wolfish, satanic instincts that lurk within even our civilized selves," as the jacket of the paperback edition has it. "These readers [writes Hesse] have completely overlooked that above the Steppenwolf and his problematical life there exists a second, higher, timeless world . . . which contrasts the suffering of the Steppenwolf with a transpersonal and transtemporal world of faith, that the book certainly tells of pain and suffering but is the story of a believer not a tale of despair."

As in *Siddhartha*, Hesse involves the reader in his fantastic tale, his ideas, his mental acrobatics, only to show at the end that the whole structure is illusory mind-play. The mental rug is suddenly pulled out from under the gullible psychodynamic reader. This Zen trick is evident on at least two levels in the *Steppenwolf*. First, in the little "Treatise," a brilliant portrait of Harry, the man with two souls: the man — refined, clever and interesting; and the wolf — savage, untamable, dangerous and strong. The treatise describes his swings of mood, his bursts of creativity, his ambivalent relationship to the bourgeoisie, his fascination with suicide, his inability to reconcile the two conflicting selves. A breathtakingly subtle psychological analysis. Then, the sleight of hand:

..... There is . . . a fundamental delusion to make clear. All interpretation, all psychology, all attempts to make things comprehensible, require the medium of theories, mythologies and lies; and a self-respecting author should . . . dissipate these lies so far as may be in his power. . . . Harry consists of a hundred or a thousand selves, not of two. His life oscillates, as everyone's does, not merely between two poles, such as the body and the spirit, the saint and the sinner, but between thousands

..... Man is an onion made up of a hundred integuments, a texture made up of many threads. The ancient Asiatics knew this well enough, and in the Buddhist Yoga an exact technique was devised for unmasking the illusion of the personality. The human merry-go-round sees many changes: the illusion that cost India the efforts of thousands of years to unmask is the same illusion that the West has labored just as hard to maintain and strengthen.

The dualistic self-image is described — the fascinating and compelling Freudian metaphor — and is then exposed as a delusion, a limited, pitiful perspective, a mind-game. The second example of

THE PSYCHEDELIC REVIEW

this trick occurs at the end of the book. We have followed Hesse in his descriptions of Harry, as he runs through a series of vain attempts to conquer his despair — through alcohol, through sex, through music, through friendship with the exotic musician Pablo — finally he enters the Magic Theater. "Price of Admission, your Mind." — In other words, a mind-loss experience.

From a recess in the wall [Pablo] took three glasses and a quaint little bottle. . . . He filled the three glasses from the bottle and taking three long thin yellow cigarettes from the box and a box of matches from the pocket of his silk jacket he gave us a light. . . . Its effect was immeasurably enlivening and delightful — as though one were filled with gas and had no longer any gravity.

Pablo says :

You were striving, were you not, for escape? You have a longing to forsake this world and its reality and to penetrate to a reality more native to you, to a world beyond time. . . . You know, of course, where this other world lies hidden. It is the world of your own soul that you seek. Only within yourself exists that other reality for which you long. . . . All I can give you is the opportunity, the impulse, the key. I help you to make your own world visible. . . . This . . . theater has as many doors into as many boxes as you please, ten or a hundred or a thousand, and behind each door exactly what you seek awaits you. . . . You have no doubt guessed long since that the conquest of time and the escape from reality, or however else it may be that you choose to describe your longing, means simply the wish to be relieved of your so-called personality. That is the prison where you lie. And if you enter the theatre as you are, you would see everything through the eyes of Harry and the old spectacles of the Steppenwolf. You are therefore requested to lay these spectacles aside and to be so kind as to leave your highly esteemed personality here in the cloak-room, where you will find it again when you wish. The pleasant dance from which you have just come, the treatise on the Steppenwolf, and the little stimulant that we have only this moment partaken of may have sufficiently prepared you.

It seems clear that Hesse is describing a psychedelic experience, a drug-induced loss of self, a journey to the inner world. Each door in the Magic Theatre has a sign on it, indicating the endless possibilities of the experience. A sign called "Jolly Hunting. Great Automobile Hunt" initiates a fantastic orgy of mechanical destruction in which Harry becomes a lustful murderer. A second sign reads: "Guidance in the Building-Up of the Personality. Success

Hermann Hesse: Poet of the Interior Journey

Guaranteed," which indicates a kind of chess game in which the pieces are the part of the personality. Cosmic psychotherapy. "We demonstrate to anyone whose soul has fallen to pieces that he can rearrange these pieces of a previous self in what order he pleases, and so attain to an endless multiplicity of moves in the game of life." Another sign reads: "All Girls Are Yours," and carries Harry into inexhaustible sexual fantasies. The crisis of the Steppenwolf, his inner conflicts, his despair, his morbidity and unsatisfied longing are dissolved in a whirling kaleidoscope of hallucinations. "I knew that all the hundred thousand pieces of life's game were in my pocket. A glimpse of its meaning had stirred my reason and I was determined to begin the game afresh. I would sample its tortures once more and shudder again at its senselessness. I would traverse not once more, but often, the hell of my inner being. One day I would be a better hand at the game. One day I would learn how to laugh. Pablo was waiting for me, and Mozart too."

So Harry Haller, the Steppenwolf, had his psychedelic session, discovered instead of one reality, infinite realities within the brain. He is admitted into the select group of those who have passed through the verbal curtain into other modes of consciousness. He has joined the elite brotherhood of the illuminati.

And then what? Where do you go from there? How can the holy sense of unity and revelation be maintained? Does one sink back into the somnambulant world of rote passion, automated action, egocentricity? The poignant cry of ex-League member, H.H.: "That almost all of us — and also I, even I — should again lose myself in the soundless deserts of mapped out reality, just like officials and shop-assistants who, after a party or a Sunday outing, adapt themselves again to everyday business life!" These are issues faced by everyone who has passed into a deep, trans-ego experience. How can we preserve the freshness; illuminate each second of subsequent life? How can we maintain the ecstatic oneness with others?

Throughout the ages mystical groups have formed to provide social structure and support for transcendence. The magic circle. Often secret, always persecuted by the sleep-walking majority, these cults move quietly in the background shadows of history. The problem is, of course, the amount of structure surrounding the mystical spark. Too much, too soon, and you have priesthood ritual on your

THE PSYCHEDELIC REVIEW

hands. And the flame is gone. Too little and the teaching function is lost, the interpersonal unity drifts into gaseous anarchy. The Bohemians. The Beats. The lonely arrogants.

Free from attachment to self, to social games, to anthropomorphic humanism, even to life itself, the illuminated soul can sustain the heightened charge of energy released by transcendent experiences. But such men are rare in any century. The rest of us seem to need support on the way. Men who attempt to pursue the psychedelic drug path on their own are underestimating the power and the scope of the nervous system. A variety of LSD casualties results: breakdown, confusion, grandiosity, prima-donna individualism, disorganized eccentricity, sincere knavery and retreat to conformity. It makes no more sense to blame the drug for such casualties than it does to blame the nuclear process for the bomb. Would it not be more accurate to lament our primitive tribal pressures towards personal power, success, individualism?

Huston Smith has remarked that of the eight-fold path of the Buddha, the ninth and greatest is Right Association. The transpersonal group. The consciousness-expansion community. Surround yourself after the vision, after the psychedelic session, with friends who share the goal, who can uplevel you by example or unitive love; who can help reinstate the illumination.

The sociology of transcendence. Hesse takes up the problem of the transpersonal community in the form of the League of Eastern Wayfarers.³

"It was my destiny to join in a great experience. Having had the good fortune to belong to the League, I was permitted to be a participant in a unique journey." The narrator, H.H., tells that the starting place of the journey was Germany, and the time shortly after World War I. "... our people at that time were lured by many phantoms, but there were also many real spiritual advances. There were Bacchanalian dance societies and Anabaptist groups, there was one thing after another that seemed to point to what was wonderful and beyond the veil." There were also scientific and artistic groups engaged in the exploration of consciousness-expanding drugs. Kurt Beringer's monograph, *Der Meskalinrausch*.⁴ describes some of the scientific experiments and the creative applications. René

Hermann Hesse: Poet of the Interior Journey

Daumal's novel, *Le Mont Analogue*,⁵ is a symbolic account of a similar league journey in France. The participants were experimenting widely with drugs such as hashish, mescaline and carbon tetrachloride.

Hesse never explicitly names any drugs in his writings, but the passages quoted earlier from the *Steppenwolf* are fairly unequivocal in stating that some chemical was involved and that it had a rather direct relationship to the subsequent experience. Now, after this first enlightenment, in *Journey to the East*, H.H. tells of subsequent visits to the Magical Theatre.

... We not only wandered through Space, but also through time. We moved towards the East, but we also traveled into the Middle Ages and the Golden Age; we roamed through Italy or Switzerland, but at times we also spent the night in the 10th century and dwelt with the patriarchs or the fairies. During the times I remained alone, I often found again places and people of my own past. I wandered with my former betrothed along the edges of the forest of the Upper Rhine, caroused with friends of my youth in Tübingen, in Basle or in Florence, or I was a boy and went with my school-friends to catch butterflies or to watch an otter, or my company consisted of the beloved characters of my books; ... For our goal was not only the East, or rather the East was not only a country and something geographical, but it was the home and youth of the soul, it was everywhere and nowhere, it was the union of all times.

Later the link between the *Steppenwolf's* drug liberation and the League becomes more specific:

When something precious and irretrievable is lost, we have the feeling of having awakened from a dream. In my case this feeling is strangely correct, for my happiness did indeed arise from the same secret as the happiness in dreams; it arose from the freedom to experience everything imaginable simultaneously, to exchange outward and inward easily, to move Time and Space about like scenes in a theatre.

Hesse is always the esoteric hand, but there seems to be little doubt that beneath the surface of his Eastern allegory runs the history of a real-life psychedelic brotherhood. The visionary experiences described in *Journey to the East* are identified by location and name of participants. A recently published biography⁶ traces the connections between these names and locations and Hesse's friends and activities at the time.

THE PSYCHEDELIC REVIEW

And again and again, in Swabia, at Bodensee, in Switzerland, everywhere, we met people who understood us, or were in some way thankful that we and our League and our Journey to the East existed. Amid the tramways and banks of Zürich we came across Noah's Ark guarded by several old dogs which all had the same name, and which were bravely guided across the dangerous depths of a calm period by Hans C., Noah's descendant, friend of the arts.

Hans C. Bodmer is Hesse's friend, to whom the book is dedicated, and who later bought the house in Montagnola for Hesse. He lived at the time in a house in Zürich named "The Ark."

One of the most beautiful experiences was the League's celebration in Bremgarten; the magic circle surrounded us closely there. Received by Max and Tilli, the lords of the castle. . . .

Castle Bremgarten, near Bern, was the house of Max Wassmer, where Hesse was often a guest. The "Black King" in Winterthur refers to another friend, Georg Reinhart, to whose house, "filled with secrets," Hesse was often invited. The names of artists and writers which occur in *Journey to the East*, are all either directly the names of actual historical persons or immediately derived from them: Lauscher, Klingsor, Paul Klee, Ninon (Hesse's wife), Hugo Wolf, Brentano, Lindhorst, etc. In other words, it appears likely that the scenes described are based on the actual experiences of a very close group of friends who met in each other's homes in Southern Germany and Switzerland and pursued the journey to what was "not only a country and something geographical, but it was the home and youth of the soul, it was everywhere and nowhere, it was the union of all times."

So the clues suggest that for a moment in "historical reality" a writer named Hermann Hesse and his friends wandered together through the limitless pageants of expanded consciousness, down through the evolutionary archives. Then, apparently, H.H. loses contact, slips back to his mind and his egocentric perspectives. ". . . the pilgrimage had shattered . . . the magic had then vanished more and more." He has stumbled out of the life-stream into robot rationality. H.H. wants to become an author, spin in words the story of his life. "I, in my simplicity, wanted to write the story of the League, I, who could not decipher or understand one-thousandth part of those millions of scripts, books, pictures and references in the archives!" Archives? The cortical library?

Hermann Hesse: Poet of the Interior Journey

What then was, is, the League? Is it the exoteric society with a golden-clad President, Leo, maker of ointments and herbal cures, and a Speaker, and a High Throne, and an extended council hall? These are but the exoteric trappings. Is not the League rather the "procession of believers and disciples . . . incessantly . . . moving towards the East, towards the Home of Light"? The eternal stream of life ever unfolding. The unity of the evolutionary process, too easily fragmented and frozen by illusions of individuality. ". . . a very slow, smooth but continuous flowing or melting; . . . It seemed that, in time, all the substance from one image would flow into the other and only one would remain. . . ."

Many who have made direct contact with the life-process through a psychedelic or spontaneous mystical experience find themselves yearning for a social structure. Some external form to do justice to transcendental experiences. Hermann Hesse again provides us with the esoteric instructions. Look within. The League is within. So is the two-billion-year-old historical archive, your brain. Play it out with those who will dance with you, but remember, the external differentiating forms are illusory. The union is internal. The League is in and around you at all times.

But to be human is to be rational. *Homo sapiens* wants to know. Here is the ancient tension. To be. To know. Well, the magician has a spell to weave here, too. The intellect divorced from old-fashioned neurosis, freed from egocentricity, from semantic reification. The mind illuminated by meditation ready to play with the lawful rhythm of concepts. The Bead Game.

*The Bead Game (Magister Ludi),⁷ begun in 1931, finished eleven years later, was published six months after its completion, but in Switzerland, not Germany. "In opposition to the present world I had to show the realm of mind and of spirit, show it as real and unconquerable; thus my work became a Utopia, the image was projected into the future, and to my surprise the world of Castalia emerged almost by itself. Without my knowledge, it was already preformed in my soul." Thus wrote Hesse in 1955. The Bead Game is the synthesis and end-point of Hesse's developing thought; all the strands begun in *Siddhartha*, *Journey to the East*, *Steppenwolf* are woven together into a vision of a future society of mystic game-players. The "players with pearls of glass" are an élite of intellectual mystics who, analogously to the monastic orders of the Middle Ages,*

THE PSYCHEDELIC REVIEW

have created a mountain retreat to preserve cultural and spiritual values. The core of their practice is the bead game, "a device that comprises the complete contents and values of our culture." The game consists in the manipulation of a complex archive of symbols and formulae, based in their structure on music and mathematics, by means of which all knowledge, science, art and culture can be represented.

This Game of games . . . has developed into a kind of universal speech, through the medium of which the players are enabled to express values in lucid symbols and to place them in relation to each other. . . . A Game can originate, for example, from a given astronomical configuration, a theme from a Bach fugue, a phrase of Leibnitz or from the Upanishads, and the fundamental idea awakened can, according to the intention and talent of the player, either proceed further and be built up or enriched through assonances to relative concepts. While a moderate beginner can, through these symbols, formulate parallels between a piece of classical music and the formula of a natural law, the adept and Master of the Game can lead the opening theme into the freedom of boundless combinations.

The old dream of a *universitas*, a synthesis of human knowledge, combining analysis and intuition, science and art, the play of the free intellect, governed by aesthetic and structural analogies, not by the demands of application and technology. Again, on the intellectual plane, the problem is always just how much structure the mind game should have. If there are no overall goals or rules, we have ever-increasing specialization and dispersion, breakdown in communication, a Babel of cultures, multiple constrictions of the range in favor of deepening the specialized field. Psychology. If there is too much structure or over-investment in the game-goals, we have dogmatism, stifling conformity, ever-increasing triviality of concerns, adulation of sheer techniques, virtuosity at the expense of understanding. Psychoanalysis.

In the history of the bead game, the author explains, the practice of meditation was introduced by the League of Eastern Wayfarers in reaction against mere intellectual virtuosity. After each move in the game a period of silent meditation was observed; the origins and meaning of the symbols involved were slowly absorbed by the players. Joseph Knecht, the Game Master, whose life is described in the book, sums up the effect as follows:

Hermann Hesse: Poet of the Interior Journey

The Game, as I interpret it, encompasses the player at the conclusion of his meditation in the same way as the surface of a sphere encloses its centre, and leaves him with the feeling of having resolved the fortuitous and chaotic world into one that is symmetrical and harmonious.

Groups which attempt to apply psychedelic experiences to social living will find in the story of Castalia all the features and problems which such attempts inevitably encounter: the need for a new language or set of symbols to do justice to the incredible complexity and power of the human cerebral machinery; the central importance of maintaining direct contact with the regenerative forces of the life-process through meditation or other methods of altering consciousness: the crucial and essentially insoluble problem of the relation of the mystic community to the world at large. Can the order remain an educative, spiritual force in the society, or must it degenerate through isolation and inattention to a detached, alienated group of idealists? Every major and minor social renaissance has had to face this problem. Hesse's answer is clear: the last part of the book consists of three tales, allegedly written by Knecht, describing his life in different incarnations. In each one the hero devotes himself wholeheartedly to the service and pursuit of an idealist, spiritual goal, only to recognize at the end that he has become the slave of his own delusions. In "The Indian Life" this is clearest: Dasa, the young Brahmin, meets a yogi who asks him to fetch water; by the stream Dasa falls asleep. Later he marries, becomes a prince, has children, wages war, pursues learning, is defeated, hurt, humiliated, imprisoned, dies and — wakes up by the stream in the forest to discover that everything had been an illusion.

Everything had been displaced in time and everything had been telescoped within the twinkling of an eye: everything was a dream, even that which had seemed dire truth and perhaps also all that which had happened previously — the story of the prince's son Dasa, his cowherd's life, his marriage, his revenge upon Nala and his sojourn with the Yogi. They were all pictures such as one may admire on a carved palace wall, where flowers, stars, birds, apes and gods can be seen portrayed in bas-relief. Was not all that which he had most recently experienced and now had before his eyes — this awakening out of his dream of princehood, war and prison, this standing by the spring, this water bowl which he had just shaken, along with the thoughts he was now thinking — ultimately woven of the same stuff? Was it not dream, illusion, Maya? And what he was about to live in the

THE PSYCHEDELIC REVIEW

future, see with his eyes and feel with his hands until death should come — was that of other stuff, of some other fashion? It was a game and a delusion, foam and dream, it was Maya, the whole beautiful, dreadful, enchanting and desperate kaleidoscope of life with its burning joys and sorrows.

The life of Joseph Knecht is described as a series of awakenings from the time he is "called" to enter the Castalian hierarchy ("Knecht" in German means "servant"), through his period as Magister Ludi, to his eventual renunciation of the order and the game. Castalia is essentially the League, frozen into a social institution. Again the trickster involves us in his magnificent utopian vision, the "Game of games," only to show at the end of the transience of this form as of all others. Having reached the highest position possible in the order Knecht resigns his post. He warns the order of its lack of contact with the outside world and points out that Castalia, like any other social form, is limited in time. In his justificatory speech he refers to "a kind of spiritual experience which I have undergone from time to time and which I call 'awakening.' . . ."

I have never thought of these awakenings as manifestations of a God or a demon or even of an absolute truth. What gives them weight and credibility is not their contact with truth, their high origin, their divinity or anything in that nature, but their reality. They are monstrously real in their presence and inescapability, like some violent bodily pain or surprising natural phenomenon. . . . My life, as I saw it, was to be a transcendence, a progress from step to step, a series of realms to be traversed and left behind one after another, just as a piece of music perfects, completes and leaves behind theme after theme, tempo after tempo, never tired, never sleeping, always aware and always perfect in the present. I had noticed that, coincidental with the experience of awakening, there actually were such steps and realms, and that each time a life stage was coming to an end it was fraught with decay and a desire for death before leading to a new realm, and awakening and to a new beginning.

The mystic or visionary is always in opposition to or outside of social institutions, and even if the institution is the most perfect imaginable, the Game of games, even if it is the one created by oneself, this too is transient, limited, another realm to be traversed. After leaving Castalia, Knecht wanders off on foot:

It was all perfectly new again, mysterious and of great promise; everything that had once been could be revived, and much that was

Hermann Hesse: Poet of the Interior Journey

new besides. It seemed ages since the day and the world had looked so beautiful, innocent and undismayed. The joy of freedom and independence flowed through his veins like a strong potion, and he recalled how long it was since he had left this precious sensation, this lovely and enchanting illusion!"

So there it is. The saga of H.H. The critics tell us that Hesse is the master novelist. Well, maybe. But the novel is a social form, and the social in Hesse is exoteric. At another level Hesse is the master guide to the psychedelic experience and its application. Before your LSD session, read *Siddhartha* and *Steppenwolf*. The last part of the *Steppenwolf* is a priceless manual.

Then when you face the problem of integrating your visions with the plastic-doll routine of your life, study *Journey to the East*. Find yourself a magic circle. League members await you on all sides. With more psychedelic experience, you will grapple with the problem of language and communication, and your thoughts and your actions will be multiplied in creative complexity as you learn how to play with the interdisciplinary symbols, the multi-level metaphors. *The Bead Game*.

But always — Hesse reminds us — stay close to the internal core. The mystic formulae, the League, the staggeringly rich intellectual potentials are deadening traps if the internal flame is not kept burning. The flame is of course always there, within and without, surrounding us, keeping us alive. Our only task is to keep tuned in.

REFERENCES

- ¹ *Siddhartha*. (Transl. Hilda Rosner.) New York: New Directions, 1951. New Directions Paperbooks, 1957. (Quotes from pp. 20, 144, 147, 151-53.) [*Siddhartha*. Eine indische Dichtung. Berlin: S. Fischer, 1922.]
- ² *Steppenwolf*. (Transl. Basil Creighton.) New York: Holt (1929); Ungar (1957); Random House [Modern Library] (1963). (Quotes from pp. vi, 62, 63, 66-7, 197-99, 217, 246.) [*Der Steppenwolf*. Berlin: S. Fischer, 1927.]
- ³ *The Journey to the East*. (Transl. Hilda Rosner.) New York: Noonday Press Paperback, 1957. (Quotes from pp. 31, 3, 10, 27-8, 29, 96, 118. Translation occasionally emended.) [*Die Morgenlandfahrt*. Eine Erzählung. Berlin: S. Fischer, 1932.]
- ⁴ Kurt Beringer: *Der Meskalinrausch*, seine Geschichte und Erscheinungsweise. Berlin: Springer, 1927.

THE PSYCHEDELIC REVIEW

- 5 René Daumal: *Mount Analogue*. An Authentic Narrative. (Transl. and intro. by Roger Shattuck; postface by Véra Daumal.) London: Vincent Stuart, 1959. New York: Pantheon, 1960. [*Le mont analogue*. Préface par Rolland de Renéville, récit véridique. Paris: Librairie Gallimard, 1952.]
- 6 Bernhard Zeller: *Hermann Hesse: Eine Chronik in Bildern*. Frankfurt a.M.: Suhrkamp, 1960.
- 7 *Magister Ludi (The Bead Game)*. (Transl. Mervyn Savill.) New York: Holt (1949); Ungar Paperback (1957). (Quotes from pp. 17, 39, 10, 500-1, 355-6, 359, 367.) [*Das Glasperlenspiel*. Versuch einer Lebensbeschreibung des Magister Ludi Josef Knecht samt Knechts hinterlassenen Schriften. 2 vv. Zürich: Fretz & Wasmuth, 1943. Frankfurt a.M.: Suhrkamp, 1961.]
- [A complete listing of Hesse's works and the critical literature on him is available in Helmut Waibler's *Hermann Hesse: Eine Bibliographie*. Bern und München: Francke, 1962. Pp. 350.]

Did Hesse use mind-changing drugs?

Although the argument of the preceding commentary does not depend on the answer to this question, there are sufficient clues in Hesse's writings to make the matter of some historical and literary interest. In Germany, at the time Hesse was writing, considerable research on mescaline was going on. This has been reported in a monograph by Kurt Beringer *Der Meskalinrausch*. Much of the material was also analyzed in Heinrich Klüver's monograph, *Mescal*, the first book on mescaline published in English.*

In response to our inquiry, Professor Klüver, now at the University of Chicago, has written:

To my knowledge Hermann Hesse never took mescaline (I once raised this question in Switzerland). I do not know whether he even knew of the mescaline experiments going on under the direction of Beringer in Heidelberg. You know, of course, that Hesse (and his family) was intimately acquainted with the world and ideas of India. This no doubt has colored many scenes in his books.

Readers of the journal who have any further information bearing on this question are invited to communicate with the editors.

* *Mescal*. The 'Divine' Plant and Its Psychological Effects. London: Kegan Paul, Trench & Trubner, 1928. (To be reprinted late 1964, Univ. of Chicago Press.)

Psychometabolism

SIR JULIAN HUXLEY¹

As a mere biologist, I felt somewhat alarmed on being asked to talk on psychological matters to a gathering of psychiatrists. I eventually decided to approach the subject in the general perspective of evolution, and to speak about the role of mind as an operative factor in the evolutionary process.

If we look at the process of biological evolution as a whole, we will see that it tends toward the production of types which can utilize more of the world's space and material resources more efficiently. To achieve this, new types of metabolic utilization appear. The most fundamental metabolic divergence was that between green plants and animals. Later, there developed many new types of metabolic systems, capable of utilizing new materials. Termites, with the aid of their intestinal protozoa, can utilize wood; ruminants can utilize cellulose with the aid of their bacterial flora and protozoan fauna. Sometimes greater efficiency of exploitation is attained by symbiosis. The most famous case of such symbiosis between complementary metabolic systems is that of the lichens, which are mixed organisms, part algae and part fungi.

It is important to note that these metabolic novelties may produce results which affect the further course of evolution, by altering or even increasing the material resources available for future generations. Thus during much more than half the period of life's evolution on earth, there was no wood. When abundant wood was eventually produced by large green terrestrial plants, it provided the material for a new type of metabolic exploitation by termites. Again, once terrestrial vertebrates had produced keratin in bulk, the opportunity arose for the evolution of clothes-moths. This type of cybernetic feedback is a regular feature of the evolutionary process.

The other major tendency in biological evolution is manifested in the evolution of mind, a trend towards a higher degree of awareness. This is especially marked in the later stages of the process in the dominant types of animals, notably insects, spiders and verte-

THE PSYCHEDELIC REVIEW

brates, and is of course mediated by their brains. Brains can be regarded as psychometabolic organs. Just as the physiological metabolic systems of organisms utilize the raw material provided by the physicochemical resources of the environment and metabolize them into special material substances, so brains, more highly developed, utilize the raw materials of simple experience and transform them into special systems of organized awareness.

This at once brings up the perennial problem of the relation between mind and body. We must first remember that the only primary reality we know is our own subjective experience. We can only *deduce* that other human beings have similar subjective experiences. This is perfectly legitimate, both logically and scientifically. It is also necessary pragmatically; life could not go on otherwise. We are sometimes able to detect and prove differences in other people's possibilities of subjective awareness, as, for example, with color-blindness or "taste-blindness." But in general we quite legitimately deduce that other human beings are conscious and have minds similar to ours, because they are made in the same sort of way and behave in the same sort of way, and because that is the only basis for understanding them and co-existing with them.

The only satisfactory approach to the general problem is an evolutionary one. We begin with man as an organization of *Weltstoff* — the stuff of which the universe is made. The human organization has two aspects: first, a material one when seen from the outside, and secondly a mental or subjective one when experienced from the inside. We are simultaneously and indissolubly both matter and mind.

Extending our survey to higher animals, it is not only scientifically legitimate but obvious that we must ascribe subjective awareness to them, as Darwin did in his great book *The Expression of Emotions in Man and Animals*. It is all too obvious for the higher apes. It is equally legitimate to say that mammals such as dogs must possess a marked degree of subjective awareness; otherwise, indeed, we should not be able to interpret their behavior at all. We can extend the principle to lower vertebrates with a high though lesser degree of certainty. Indeed, I do not see how you can refuse some sort of subjective awareness to higher invertebrates such as bees and ants. This, however, poses an extremely interesting neurological problem — how are bees and ants capable of their extremely complex behavioral activities? For instance, bees have a symbolic language, yet their brain is no bigger than a pin's head, with a number of neurons

Psychometabolism

many orders of magnitude lower than that in any vertebrate brain.

The legitimacy and indeed the necessity of extending the capacity for awareness to less complex organizations than our human selves is equally obvious when we consider our own development. After all, we all start as a fertilized ovum whose behavior gives no evidence of awareness. Unless we believe that an entity like a "soul" or "mind" is somehow inserted into the human embryo from outside at some stage, we must conclude that this capacity for subjective awareness arises naturally and gradually in the course of development out of some dim original potentiality.

In this connection an analogy with bioelectricity is useful. As any zoologist knows, there are several genera of electric fish. Some are capable of giving quite severe shocks, while others, which are inhabitants of muddy waters where vision is not of much use, emit electric pulses by means of which they detect objects at a distance and so can steer themselves. (In passing, it is interesting that Galen mentions that electro-shock treatment was employed in antiquity — torpedo fish were used as a cure for headache and various other disorders.) A century ago, the electrical properties of these fish were supposed to be unique, and the problem of their evolutionary origin was a great puzzle to Darwin. However, we now know that the activities of every living cell in the body are accompanied by minute electrical changes: such changes occur every time a gland secretes or a muscle contracts. These are accidental epiphenomena, in the sense that they are not of direct biological advantage to the organism, but are merely consequences of the way living substance is made. In electric fish, on the other hand, certain tissues (muscular in some cases, glandular in others), have been modified so as to amplify and summate these minute electrical changes until they reach an intensity which is of biological significance.

This provides a perfectly good analogy with the evolution of mind. In this view, every living organism has what I may call a "mentoid" or potentially mental aspect, something of the nature of subjective awareness which is merely a consequence of the way it is made, and confers no biological advantage in its life. Brains, on the other hand, are organs where a large number of impulses from many different kinds of sense-organs, extero-, intero-, and proprioceptive, are brought together in some kind of closed-circuit system and can interact and combine there without issuing directly in motor activity, as with reflex systems. Brains are thus a mechanism for

intensifying, amplifying and organizing life's original dim subjectivity to a level where it becomes significant in the life of the organism.

Today, we can be certain that biological evolution has taken place primarily, and indeed almost wholly, by means of the mechanism of natural selection. This means that no important character can evolve unless it is of biological advantage. This being so, mind cannot be just a useless epiphenomenon; it must be of significance and confer biological advantage. It does so by giving the organism a fuller awareness of both outer and inner situations, thus providing better guidance for behavior in the chaos and complexity of existence.

One way in which it does this is that, in some unexplained way, it generates qualitative distinction out of quantitative difference. The sensation of blue is irreducibly different from red. The difference between blue and red depends on quantitative differences in the frequency of the light-waves reaching the retina and of the impulses passing up the optic nerves, but, as sensations, blueness and redness are qualitatively distinct. Biologically, this permits readier discrimination between objects: it is much easier to discriminate between two qualitatively different colors than between two quantitatively different shades of gray.

Discrimination is similarly aided by the radical qualitative differences between the different modalities of sensation — sight, hearing, touch, smell, and so on — which again are irreducible in terms of any common factor. Again, it is essential to be able to discriminate potentially damaging situations and objects from those which are potentially enjoyable and useful, and this has been achieved through the radical qualitative difference between the sensations of pleasure and of pain. Similarly, it is valuable to discriminate between threatening or dangerous situations and desirable or useful ones: this has been achieved by the evolution of sharp quantitative differences in our "built-in" emotions — fear as against curiosity, for example, or sexual attraction as against hostility.

Finally, the central organ of awareness, the brain, has the astonishing capacity of integrating an enormous number of separate, and often disparate, elements of experience into an organized pattern of which the animal is aware as a whole, and which it experiences as different from all other such patterns. One of the ways in which experience is integrated is in memory; another way is in mental organizations for directing future behavior.

This integration of sensory information into organized patterns which can be readily discriminated in awareness may produce extraordinary results. Some of the most extraordinary are concerned with the way in which animals find their way about. For instance, we now know that migrating birds find their way by steering with the sun if they are day migrants and by the constellations if they are night migrants. Of course, they can only do this by means of some extremely elaborate computer system in their brains — though this is no more elaborate than the computer system in our own brains which enables us, while playing tennis, to anticipate our opponent's stroke with appropriate movements of our own. In both cases, however, the computer system is only the mechanism of the action; the organism must in some way be aware of the situation as a whole in order to put the computer system into operation. This instantaneous awareness of total situations is a psychometabolic activity of decisive importance for successful behavior.

Many interesting psychometabolic organizations operate in higher animals. Frequently, learning capacity is grafted onto an innate response. A good example is found in the English Robin, which is quite different from the American Robin, a smaller bird with a brighter red breast. In the breeding season, the sight of a red-breasted rival will stimulate hostility in a male Robin in occupancy of a territory. The same effect is produced by a stuffed dummy; even if the dummy's head, tail and wings are removed, leaving only a fragment of body with a patch of red feathers, this will be attacked in the same way. The sight of the red breast is a simple sign-stimulus which releases a built-in mechanism of attack. On the other hand, the system can be modified by the further psychometabolic activity of learning. A male Robin will learn to accept a female as mate even though she too has a red breast; and eventually, through becoming aware of slight differences in behavior, he will learn to discriminate between his individual mate and other female Robins, though they are indistinguishable to the human observer.

Just as the evolution of new kinds of material metabolism can provide the material basis for further biological change, so the evolution of new kinds or modes of awareness has effects on later evolution. Let me again take color and pattern as an example. As soon as there were organisms which came into existence possessing the capacity for colored pattern-vision, new and adaptive patterns began to evolve, both in members of the same species and in other

THE PSYCHEDELIC REVIEW

species. Such characters are called *allaesthetic*; they have evolved in relation to the sensory capacity of other organisms. Patterns of warning coloration in insects, for instance, could not have evolved except in relation to the color-vision of the predators of the insects; and the striking color-patterns seen in the sexual display of birds could not have evolved unless birds were capable of color-vision and pattern-discrimination. Striking examples of *allaesthetic* characters are found in flower-color. Bees are completely red-blind, but they can see ultraviolet. In consequence, there is a total absence of pure scarlet flowers pollinated by bees. Some pure scarlet flowers exist, but they are all pollinated by birds, because birds can see red. Conversely, if bee-pollinated flowers are photographed by ultraviolet light, patterns are often revealed which are invisible to our eyes, but are of functional importance in guiding the bees to the nectar: they have been evolved in relation to this capacity of bees to see ultra-violet.

Let me return to the simple visual patterns serving to release specific behavior, which have come into prominence through the work of men like Lorenz and Tinbergen and Thorpe. The newly hatched Herring-gull pecks at its parent's bill, which then regurgitates food for it. Tinbergen showed that if the newly hatched young is tested before it has even seen an adult bird, it will peck just as well at a colored cardboard model as at the real parent's beak. The pattern of the beak — yellow with a red spot at the tip of the lower mandible — acts as a sign-stimulus operating the mechanism releasing the pecking reaction.

The whole system is "innate" — genetically determined. But its operation can be modified. As mentioned earlier, the normal beak is yellow, fairly elongated and with a red spot near the end of the lower mandible. A model without any spot has very little effect on the young. One with a spot of another color than red will be less efficient than the normal pattern, but more so than a model without any spot. Shortening the beak will make the model less effective, while a model which is not in the least like a normal beak, but is a very elongated rectangle with a very bright red spot near its end, will elicit a *supernormal* response — it will induce the young to peck at it more vigorously than they will at their own parent's beak.

We find similar phenomena in human beings. Here again, we find *allaesthetic* characters. In the evolution of man, both color and form have been employed as sign-stimuli, releasing sexual behavior

Psychometabolism

or at least promoting sexual attraction. The red color of lips and cheeks is obviously of value in sexual selection, and its *supernormal* enhancement by rouge and lipstick is the basis for a large portion of the lucrative cosmetics industry. The form of the female breast is also a sexual sign-stimulus: its enhancement is the basis for the manufacture of brassieres, and its *supernormal* exaggeration has given rise to the article known as "falsies."

Ethology, as the study of animal behavior is now called, has led to some illuminating facts about the results of conflict situations. If a bird's aggressive impulses are stimulated by the presence of a rival, it often shows what is called an "intention movement" before it actually starts fighting — it gets itself into readiness for fighting. Similarly, if it is frightened, but before it actually flies off, it often shows an "intention movement" preparatory to flight. Sometimes a situation occurs in which two such emotional forces or drives are opposed in conflict. For instance, early in the breeding season, when the birds begin to mate up, the close proximity of another individual still elicits a certain amount of hostility and/or fear. Accordingly the male bird, as he approaches the female, is simultaneously animated by sexual attraction, hostility and fear. The result is a compromise attitude, intermediate between the intention movements of approach and of fleeing. Since such compromise attitudes are a regular feature of sexual approach in early breeding season, they have been utilized and polished up (if I may speak metaphorically) by natural selection and turned into functional sign-stimuli, which release sexual behavior-patterns in the mate. Attitudes which originate as mere consequences of a conflict become ritualized and converted into something of biological importance in their own right.

Another surprising consequence of conflict is what ethologists call "displacement activity." Apparently, when two conflicting drives are operating at high intensity, instead of just canceling each other out, the excess nervous tension (if I may again speak metaphorically) spills over into some quite irrelevant activity. In bird courtship, the frequent conflict between hostility and fear, instead of leading to a compromise attitude, may spill over into so-called displacement preening: the birds "make as if" to preen themselves, but do not really do so. Here again, actions which start as mere consequences may be seized on by natural selection and converted into functional sign-stimuli. Thus the displacement preening attitude of many species of

duck has been exaggerated, and the parts of the plumage to which it is directed have come to be adorned with bright colors, so that it has come to play a significant role as a releaser of mating behavior.

As Tinbergen and Lorenz have shown, these facts have relevance for man. Human beings show many displacement activities, such as scratching their heads when puzzled. More basically, conflict and the reconciliation of conflict in meaningful activity are of fundamental importance in human mental development, and are one of the chief concerns of psychiatrists. In man, instead of conflicting drives resulting in overt compromise attitudes, they often continue to operate internally. This results in a conflict of what we may call "intention urges" — urges or drives toward aggression, or fear, or sexual attraction; but whatever the conflict is based on, it is not overtly manifested in action. The problem is this: can these conflicting urges be reconciled internally and converted into something which combines the energy of both drives in a single and functionally valuable "superdrive"? Or are their energies going to remain locked up, so to speak, in functionally useless conflict? Or is half the energy of the conflicting drives going to be wasted by the repression of one of them?

In man there are very few examples of built-in sign-stimuli acting as releasers. The best-known is the so-called smile reflex of the human infant, which Spitz and others have studied. Even a crude model of a smiling human face will elicit a smile from the human infant at a certain early stage of life. Later, this becomes a more sophisticated reaction: learning enters in and you have to have a real face with a real smile, or at least a reasonable representation of them. The interesting thing about the smile reaction is that it is a self-reinforcing process. When the infant smiles at the mother, even if she is not smiling, she will smile back in return, and vice versa. The self-reinforcing process establishes and helps to strengthen the emotional bond between mother and infant.

This establishment of emotional bonds between members of a species is obviously of the greatest importance in evolution. Once again there are traces of it in sub-human creatures. My first important piece of behavior study was on the courtship behavior of a British bird, the Great Crested Grebe. In this species, both sexes develop elaborate sexual adornments in the breeding season and employ them in mutual displays. It is quite clear that, in addition to their stimulative function, these displays serve as an emotional bond

between the members of the pair. They serve to keep the pair associated throughout the whole season, during which the young need to be looked after by both parents.

The bases of such emotional bonds are sometimes very interesting. In his fascinating studies of monkeys, Professor Harlow of Wisconsin took new-born monkeys away from their real mothers and gave them pairs of surrogate mothers. Both possessed an iron framework and a crude model of a face; one of them, the feeding mother, was provided with a bottle of milk which was the baby monkey's only source of food; the other, or furry mother, merely was covered with a furry material. In contradiction to psychoanalytic theory, the baby monkey chose to spend much more time with the furry mother, who did not satisfy its hunger but gave it a feeling of protection and an agreeable tactile sensation. It will be extremely interesting to see what happens to these monkeys after they have been brought up entirely by artificial mother surrogates. Can they be made to reaffirm an emotional bond with a real female monkey or a human surrogate? ²

Besides bonds between members of a mated pair, and those between parent and offspring, there are familial bonds and the extremely interesting social bonds that operate in organized animal societies. Konrad Lorenz's delightful and important book, *King Solomon's Ring*, gives an account of some of these. I have only time to mention one, but one which is of great interest. The wolf-pack is an organized society of proverbially aggressive animals, but when a bigger or higher-ranking wolf is quarreling with a smaller or younger one, and the smaller one feels that he is in danger of being beaten and hurt, he will adopt a special "appeasement attitude," deliberately displaying his most vulnerable part. This acts as a sign-stimulus which definitely inhibits further aggressive behavior on the part of the larger wolf, or, if you prefer, releases a non-aggressive pattern of behavior. However angry he may have been, he just finds himself unable to go on attacking the smaller animal which is advertising its defenselessness. An ethologist friend of mine has applied this fact to human situations. He has twice recently avoided punishment for motoring offenses by assuming a cringing self-deprecatory "appeasement attitude." In one case an aggrieved car-owner didn't even take his name and address; in the other a policeman wouldn't give him a ticket. I recommend this as a very useful piece of applied psychology, but it needs histrionic skill.

THE PSYCHEDELIC REVIEW

Finally there are the bonds between generations. These become of increasing importance in higher vertebrates. In some birds and mammals we see the beginnings of what one must call tradition, the handing down of the results of experience from one generation to the next. Originally this occurs only across a gap of one generation: thus among many carnivores, like foxes and lions, the young learn hunting from their parents, usually from the mother. But in the case of the Japanese monkey, we see the beginnings of cumulative tradition. The animals go about in large troops and each troop has its own food-tradition (as well as its own type of social structure): different troops have slightly different ranges of foods. Occasionally there will be an innovation. In one case young monkeys were what we call in human terms "naughty" and persisted in eating a forbidden food, even when their elders tried to stop them. Eventually the new habit spread to other juveniles, then to their mothers, then to the dominant males, and finally to the subdominant males: the process took over three years. In another case a new food habit (eating wheat) was begun by the dominant male, and then spread rapidly to females and juveniles. This is the real beginning of culture in the anthropological sense, based on the cumulative transmission of experience, including some novel experiments.

Then there are many examples of normally unrealized possibilities, cases where evolution has produced organizations which possess potentialities that are not actually realized in the normal life of the species. One of the best known cases is the counting ability of birds. Professor Otto Koehler, in Germany, found that Jackdaws have just as good a capacity for non-verbal counting as human beings. They can distinguish between sets of objects according to their number alone, up to seven, which is the limit of non-verbal counting for most humans. Of course, if we employ verbal counting — 1 - 2 - 3 - 4 - 5 - 6 and so on — we can distinguish very large numbers; but without it we cannot do any better than Jackdaws. Yet, as far as we know, this ability to count non-verbally up to seven is not utilized by Jackdaws in nature.

Another example comes from a species of titmouse, *Parus coeruleus*, the Blue Tit. In England and Western Europe after the last war there was a veritable epidemic of milk-bottle opening by these birds, pecking off the cardboard lids and drinking the cream. This was something no Blue Tit had ever done before.

In this case, individual variation was also involved. Careful

Psychometabolism

analysis showed that the habit had spread from three separate foci: there must have been three individual tit geniuses who discovered how to open milk-bottles, and the practice spread by some form of imitation or learning.

The amount of individual variability is quite high in all higher vertebrates and may be of decisive importance for the success of the species. Thus, in the Blue Tit, this valuable habit was originated by a handful of exceptional individuals. Distinctive individual variability also occurs, but in a rather different context, in Bowerbirds. Bowerbirds are of extreme interest because they show the beginning of aesthetic preference. For instance, Satin Bowerbirds not only prefer blue objects to put in front of their bowers, but reject red ones and remove them to a distance. In subjective terms, they dislike red and prefer blue. Not only that, but the males will deliberately paint the bases of the twigs composing their bowers with a mixture of berry juices and charcoal chewed up in their mouths, using a stick in their beak as a kind of brush. However, only a minority of the males do this, and still fewer individuals have learned to indulge their preference for blue objects by stealing blue bags from human houses.

The realization of such latent possibilities depends on environmental conditions. As we have just seen, man has no greater capacity for non-verbal mathematics than a Jackdaw. But in modern societies, with the aid of symbolic language and proper training, many men have the capacity for higher mathematics, although this could not have been any use to primitive man when he first evolved.

Let me take a very different example. When I was in Africa two years ago, I had the good fortune to see the famous lioness, Elsa, which Mrs. Adamson brought up and then released into the wild, where she had mated with a wild lion and produced three cubs. It was really extraordinary to see how something that one must call a human-like personality had been elicited by love and interest and devoted care from this wild and aggressive creature.

Unused potentialities are often implicit in the motor structures of animals. It is on the basis of their unrivaled manipulative abilities that chimpanzees and human beings are so intelligent. The same applies to elephants. They too are exceptionally intelligent, and can manipulate objects almost as delicately as can apes or human beings. Since they do this with trunks instead of hands, I propose to call

THE PSYCHEDELIC REVIEW

their ability *trombipulative* (I am sure that Dr. Johnson would have approved the term). But whatever we call it, it is on the basis of this ability that they have become so extremely intelligent and have developed such an elaborate social life.

(One elephantine incident, though irrelevant to my present argument, will I think interest this psychiatric gathering. When my wife and I were in the Murchison Falls Park in Uganda, the Warden told us that some months earlier he had heard an unusual type of excited screaming by an elephant. He came around a corner to find a middle-aged elephant bull approaching a younger male with homosexual intentions. The younger male was rejecting these improper advances; eventually the older bull became so frustrated that he lay on his back, rolled on the ground, and trumpeted. The younger male thereupon sat down on his haunches and just looked at the other; upon which the Warden laughed so loud that both the elephants took fright and ran off!)

Thus, if I may sum up my argument, during the biological evolution of animals, the upper level of organization of awareness has been steadily raised. This has led to a steady increase in the extent and elaboration of what we may call the animal's significant world, that part of the universe which has meaning for the organism. Think of the difference between the significant worlds of an amoeba and a flatworm, of a flatworm and a fish, of a fish and a higher mammal, of a higher mammal and ourselves.

THIS BRINGS ME TO MY REAL SUBJECT. Throughout evolution, the animal, with the aid of various bodily organs, utilizes the raw materials of its food, drink, and inspired air and transforms them into characteristic biochemical patterns which canalize and direct its physiological activities. This is metabolism. But with the aid of its brain, its organ of awareness or mind, it utilizes the raw material of its subjective experience and transforms it into characteristic patterns of awareness which then canalize and help to direct its behavior. This I venture to call psychometabolism.

During the latter stages of evolution, an increasingly efficient type of psychometabolism is superposed on and added to the universal physiological metabolism. Eventually, about 10 million years ago, purely biological evolution reached a limit, and the breakthrough to new advance was only brought about by the further elaboration of the psychometabolic apparatus of mind and brain. This gave rise

Psychometabolism

to man: it endowed him with a second method of heredity based on the transmission of experience, and launched him on a new phase of evolution operating by cumulative tradition based on ideas and knowledge. Both novelties are of course superposed on the biological methods of transmission and evolution, which he also possesses.

In man, organizations of awareness become part of the evolutionary process by being incorporated in cultural tradition. Accordingly, in human evolution totally new kinds of organization are produced: organizations such as works of art, moral codes, scientific ideas, legal systems, and religions. We men are better able to evaluate, to comprehend, to grasp far more complex total patterns and situations than any other organism. We are capable of many things that no other animal is capable of: conscious reflection, the idea of self, of death, and of the future in general; we have the capacity of framing conscious purposes which can then be translated into action, and of constructing values as norms for our activities. The result is that evolution in the psychosocial phase is primarily cultural and only to a minor extent genetic.

Of course all these new types of organization evolve like everything else. The science of comparative religion shows how religions have evolved and are still evolving. The history of science studies the evolution of scientific ideas and how they become operative in the psychosocial process.

Our mental or psychometabolic organizations fall into two main categories: those for dealing with the outer world and establishing a relation with external objects; and those for dealing with our inner world and relating our perceptions and concepts and emotional drives to each other and integrating them into a more or less harmonious whole. The ultimate aim is to deal with all kinds of conflict and to reduce mental friction, so as to get the maximum flow of what is often called mental energy.

Here I want to put in a plea against the physicists' bad semantic habit of appropriating terms from common human usage and restricting their employment to physicochemical phenomena. In the strict physicist view, it is no longer permissible for a biologist to use the term "mental energy"; for the physicists, energy is something exclusively material and mathematically definable in terms of mass, velocity and the like. But the biologist and the psychologist also need a terminology. There is something operating in the awareness-

THE PSYCHEDELIC REVIEW

organization of man and higher animals which is analogous to energy in the physical sense, and can operate with different degrees of intensity. For this, we may perhaps use the term *psynergy*, without committing ourselves to any views as to its precise nature.

A major job for all disciplines concerned with human affairs, whether biochemistry, psychology, psychiatry or social anthropology, is to investigate the extraordinary mechanisms underlying the organization and operation of awareness, so as to lay the foundation for and promote the realization of more meaningful and more effective possibilities in the psycho-social process of human evolution.

When we look at animal behavior, it is clear that differences in possibilities of awareness between different species are primarily genetic. One species of bird prefers blue, another does not: the sign-stimulus which will release adaptive patterns of action in one species of bird, will not do so in another. There is obviously a genetic basis for the difference.

Equally obviously, there is a genetic basis for the difference between the genetically exceptional individual and the bulk of the species. All great advances in human history are due to the thought or action of a few exceptional individuals, though they take effect through the mass of people and in relation to the general social background. We have seen how, already in birds and mammals, the exceptional individual can be of some importance in the life of the species. In man, the exceptional individual can be of decisive importance.

Today, many workers in psychology and psychiatry and other behavioral and social sciences resist or even deny the idea that genetic factors are important for behavior. I am sure that they are wrong. Of course environmental factors, including learning, are always operative, but so are genetic factors. To take an example, genetic differences in psychosomatic organization and somatotype are obviously correlated with differences in temperament, and these with different reactions to stress and proneness to different diseases.

Frequently, it is not so much complete genetic determination we have got to think about, but rather proneness to this or that reaction, a tendency to develop in this or that way. This comes out very clearly in regard to cancer: every different inbred strain of mice has a different degree of proneness for a different type of cancer — sometimes 40%, sometimes 80%, in a few cases 100%. Professor Roger Wil-

Psychometabolism

liams of Texas has coined a new word, *propetology*, to denote genetic proneness. A science of propetology is badly needed.

The old-fashioned behaviorists simply denied any influence to genetic factors. For them everything was due to learning; and I am afraid that a number of ethologists and students of behavior, especially in America, still stick to that point of view. They forget that even the *capacity* to learn, to learn at all, to learn at a definite time, to learn one kind of thing rather than another, to learn more or less quickly, must have some genetic basis.

One of the most curious discoveries of the past 30 or 40 years has been that of the sensory morphisms, where a considerable proportion of the population has a sensory awareness different from that of the "normal" majority. The best known cause is a taste-morphism. Phenylthiocarbamide (PTC) tastes very bitter to the majority of human beings, but a minority of about 25%, varying somewhat in different ethnic groups, cannot taste it at all except in exceedingly high concentrations. As R. A. Fisher pointed out in his great book, *The Genetical Basis of Natural Selection*, in 1930, two sharply contrasted genetic characters like this cannot coexist indefinitely in a population unless there is a balance of biological advantage and disadvantage between them. Thus whenever we find such balanced polymorphisms, or *morphisms* as they are more simply called, we know that there must be some selective balance involved. Quite recently it has been shown that PTC taste-morphism is correlated with thyroid function; here we begin to get some inkling of what advantage or disadvantage there may be.

Years ago, Fisher, Ford, and I tested all the captive chimpanzees in England for PTC sensitivity. We found, to our delight, that within the limits of statistical error they had the same proportion of non-tasters as human beings. People asked, "How did you find out?" Actually it was quite simple; we offered them a sugar solution containing PTC. If they were non-tasters, they drank it up and put the cup out for more; if they were tasters, they spat it in our faces: it was an all-or-nothing reaction. The fact that both chimpanzees and man react alike means that this balanced morphism must have been in existence in the higher primates for at least 10 million years.

There are a number of these sensory morphisms in man. There is a sex-linked morphism with regard to the smell of hydrogen cyanide, HCN; about 18% of males are insensitive to it, which can

be dangerous in a chemical works or laboratory. There is another smell-blindness with regard to the scent of Freesias. I personally am one of the considerable minority of human beings unable to smell Freesias; I can smell any other flower, but am absolutely insensitive to the particular smell of even the most fragrant Freesias. There are visual morphisms; the best known is red-green color-blindness, which is also sex-linked. Another appears to be myopia. I remember years ago discussing with Professor H. J. Muller the puzzling fact of the considerable incidence of apparently genetic myopia in modern populations. However, he pointed out that during a considerable period of human history, from the time when people began doing fine, close work and up to the period when spectacles were invented, myopia would confer certain advantages. The short-sighted man would not only be employed on well-paid work, but would usually not be sent to war, so that there was less likelihood of his being killed. This would balance the obvious disadvantage of myopia in other aspects of life.

There are some very interesting biological problems concerning sensitivity to pain. Some human mutants are apparently insensitive to pain altogether and may incur terrible injuries because damaging agencies do not hurt them; but these are very rare. On the other hand, giraffes have mouth-cavities and tongues which appear to be surprisingly insensitive to pain. I always thought that they used their beautiful long tongues to strip the leaves off the extremely thorny acacia trees on which they often feed without getting pricked; but apparently this is not so. Recently in the London Zoo, giraffes have been tested with spiny hawthorn branches: they accept them and chew them just as readily as soft foliage. This surprising fact is worth further investigation.

AT THE OTHER END of the psychometabolic scale from sensation, we have problems like schizophrenia. Apparently this too must involve a balanced morphism. First, in all countries and races there are about 1% of schizophrenic people; secondly, the disease appears to have a strong genetic basis; and thirdly, as already mentioned, genetic theory makes it plain that a clearly disadvantageous genetic character like this cannot persist in this frequency in a population unless it is balanced by some compensating advantage. In this case it appears that the advantage is that schizophrenic individuals are considerably less sensitive than normal persons to histamine, are much

less prone to suffer from operative and wound shock, and do not suffer nearly so much from various allergies. Meanwhile, there are indications that some chemical substance, apparently something like adrenochrome or adrenolutin, is the genetically-determined basis for schizophrenia, and in any case there is a chromatographically detectable so-called "mauve-factor" in the urine of schizophrenics.

This biochemical abnormality presumably causes the abnormality of perception found in schizophrenics. The way the schizophrenic psychometabolizes his sensory experience and relates his sensations to build meaningful perceptions, is disordered. Accordingly he is subject to disorders of sensation and of all sorts of perception, including disorders of perception of time and space, and of association. Apparently, schizophrenic individuals show much less consistency in association tests than do normal people. The schizophrenic's world is neither consistently meaningful nor stable: this naturally puts him out of joint with his fellow human beings and makes communication with them difficult and frustrating, so that he retires much more into his own private world.

Hallucinogens like mescaline, lysergic acid, and psilocybin (from a Mexican fungus) appear to exert similar dislocating effects on perception, even in incredibly low doses. In addition, they can produce totally new types of experience: some of their effects can elicit something quite new from the human mind. They may have unpleasant effects if the subject is in a wrong psychological state, and exceedingly pleasant and rewarding effects if he is in a right one. But in either case they may reveal possibilities of experience which the subject did not know existed at all. For this reason the term *psychedelic*, or mind-revealing, has been suggested for this type of psychotropic drug. In many ways their effect closely resembles a very brief but acute schizophrenia: perception is disordered in a way very like that seen in schizophrenic patients.

In psychedelic drugs we have a remarkable opportunity for interesting research. Nobody, so far as I know, has done any work on their effects on different types of psychologically normal people — people of high and low IQ, of different somatotypes, of different affective dispositions, on verbalizers and visualizers. This would be of extraordinary interest: we might find out not merely how to cure some defect, but how to promote creativity by enhancing the creative imagination.

THE PSYCHEDELIC REVIEW

Another problem is to discover whether psychedelics modify or enhance dreaming. The study of dreaming has received a great impetus since the recent discovery that dreaming is necessary for good mental health. If people are prevented from dreaming night after night, their mental health begins to suffer. Dreaming, it seems, provides a satisfactory way of psychometabolizing various facts and experiences that have proved resistant to the integrating efforts of our waking psychometabolic activity. Unconscious mechanisms take revenge and provide an outlet in dreams.

Early detection is another facet of the schizophrenia problem. Here too, study and research are obviously needed. Granted that there is a genetic proneness to schizophrenia, it should be possible in many cases to detect its symptoms in quite early stages of life. This could clearly best be done in the schools, so that it will be important to establish a close link between psychiatrists and school teachers. The teachers would pick out the children who are prone to schizophrenia; while the psychiatrists would then suggest appropriate methods of education and training to prevent the disease from developing.

Indeed, the subject of education in general clearly needs overhauling, in the light of the two views of the human organism that I have been advocating. Today, we have hardly begun to think of how to educate the organism as a whole — the mind-body, the joint psychophysiological mechanism which we call the human child. We confine ourselves almost entirely to mental education through verbal means, with the crude physical education of games and physical training added as something quite separate. As my brother Aldous has stressed, we need non-verbal education as well, and education of the entire mind-body instead of "mind" and "body" separately.

It is not only in regard to schizophrenia that we are confronted with situations which demand immediate remedial measures, but later find ourselves impelled to adopt a preventive or a constructive attitude. Medical history is largely the story of people trying to cope with disease, then attempting to prevent disease from arising, and finally turning their knowledge to good account in the promotion of positive health. The same is true of the psychological approach. The psychiatrist starts with the mentally diseased person, tries to cure him, or at least to prevent his disease developing further, but in the course of this remedial process, he acquires knowledge which can be of extreme importance in building up a more fruitful normal per-

Psychometabolism

sonality. However, to achieve this, a new approach is needed. Psychiatry usually attempts to analyze the causes of the diseased condition and discover its origins. The very term *psychoanalysis* commits the Freudian practitioner to this approach. This is important, but is certainly not sufficient. All important biological phenomena are irreversible processes, whose end-results are biologically more significant than their origins. Accordingly, we must study the whole process, its end-results as well as its origins, its total pattern as well as its elements.

In psychology, pure and applied, medical and educational, our main aim should be to discover how to regulate the processes of psychometabolism so that they integrate experience in a more effective and less wasteful way and produce a more fruitful end-organization. For instance, I am sure that a study of the origin and strengthening of emotional bonds will repay a great deal of effort. Let me take John Bowlby's work as an example. He studied the development of children who had been deprived of maternal care (including care by a mother substitute) during a critical period of early life, and therefore were unable to form the primary affectional bond between infant and parent. Such children proved incapable of forming further emotional bonds and of developing a normal affectional and moral organization. This whole problem of building up affectional bonds, whether between members of a family or a social group, is fundamental for human life.

The overriding psychometabolic problem, of course, is how the developing human being can integrate his interior life, whether by reconciling emotional or intellectual conflict in a higher synthesis, or by reconciling diversity in a more embracing unity. Let me take the creative arts as an example. Thus the poet must reconcile diverse and even conflicting meanings in a single work of art and, indeed, must employ multivalent or multi-significant words and phrases in the process. Good poems and paintings are among the highest products of man's psychometabolic activities. Milton's line, "Then feed on thoughts that voluntary move harmonious numbers . . ." beautifully expresses this psychometabolic concept of artistic creation, while Lowe's celebrated critical study, *The Road to Xanadu*, shows how Coleridge psychometabolized the raw materials of his personal experience, his reading and his conversations and discussions, and was able to integrate them into a single poem, "Kubla Khan," with amazing emotional impact.

THE PSYCHEDELIC REVIEW

As an example of the emotional impact exercised by great art, let me recall a story of Bertrand Russell. When he was an undergraduate at Cambridge, he and a friend were going up his staircase in College and the friend quoted Blake's famous poem, "Tiger, Tiger!, Burning Bright." Bertrand Russell had never heard or read this before, and was so overcome that he had to lean against the wall to prevent himself falling.

On the other hand, we all know that many poems and works of art fail sadly to achieve this desirable result. The way in which an operatively effective unitary pattern of intellectual, emotional and moral elements can be built up, certainly deserves study, not merely in art, but also in morality, religion, and love.

Mysticism is another psychometabolic activity which needs much further research. A really scientific study of the great mystics of the past, of their modern successors, of Yoga and other similar movements, undoubtedly would be of great value. The scientist need not, indeed must not, accept at their face value the claims of mysticism, for instance, of achieving union with God or the Absolute. But some mystics have certainly obtained results of great value and importance: they have been able to achieve an interior state of peace and strength which combines profound tranquillity and high psychological energy.

There is also the still much neglected subject of hypnotism and hypnosis, with all its implications. One of the darker chapters in the history of science and medicine is the way in which the pioneer hypnotists were attacked and often hounded out of the medical profession. Even today, there is still clearly a great deal to be discovered in this strange and exciting subject.

The field of the psychiatrist and the psychologist today is nothing less than the comprehensive study of hypnosis, drugs, education, mysticism, and the subconscious, of mental disease and mental health, of the relation between normal and abnormal or supernormal experience. Backed by the concept of psychometabolism and the fact of the increasing importance of psychological organization of experience during evolution, they will be working for a better integration of all the psychological forces operating in man's life — emotional, imaginative, intellectual and moral — in such a way as to minimize conflict and to maximize creativity. In so doing, they will be in harmony with the only desirable direction that our scientific vision

Psychometabolism

indicates for the future evolution of man — a direction making for increased fulfillment of individual human beings and fuller achievement by human societies.

¹ 31 Pond Street, Hampstead N.W. 3, London, England. Reprinted, with permission of author and publisher, from *Journal of Neuropsychiatry*, Vol. 3, Supplement No. 1, August, 1962. (Special Supplement: Symposium, "Newer Psychotropic Drugs and Human Behavior," San Francisco, April 28-29, 1962.)

² I have later learned that such monkeys suffer irreversible emotional damage and grow up permanently abnormal. Something of the sort occurs with the human babies, deprived of adequate maternal love and care during a critical period of their infancy, as John Bowlby has shown.

REFERENCES

EVOLUTION:

Huxley, Julian: *Evolution, The Modern Synthesis*, G. Allen and Unwin, Ltd., London, 1942; Harper, New York, 1943.

Huxley, Julian: *Evolution in Action*, Harper, New York, 1953.

Huxley, Julian: *The Humanist Frame*, Harper, New York, Chap. 1, 1961.

EVOLUTION OF MIND:

Darwin, Charles: *The Expression of the Emotions in Man and Animals*, London, 1872. Rev. & abridged by Surgeon-Rear-Admiral C. M. Beadnell, Watts & Co., London, 1934. Philosophical Library, New York, 1955.

Frisch, K. von: *Bees, Their Vision, Chemical Senses and Language*, Cornell University Press, Ithaca, New York, 1950.

Frisch, K. von: *The Dancing Bees*, Harcourt Brace, New York, 1955.

BRAIN AND MIND:

Hebb, D. O.: *The Organization of Behavior*, Wiley, New York, 1949.

ALLAESTHETIC CHARACTERS:

Huxley, Julian: *Evolution, the Modern Synthesis*, Harper & Brothers, New York, p. 289, 1943.

Cott, H. B.: *Adaptive Coloration in Animals*, Methuen & Co., London, 1940.

INSTINCT, RELEASERS, LEARNING, IMPRINTING, ETC.:

Lorenz, Konrad: *King Solomon's Ring*, Methuen & Co., London, 1952.

Tinbergen, N.: *The Study of Instinct*, Clarendon Press, Oxford, 1951.

Thorpe, W. H.: *Learning and Instinct in Animals*, Methuen & Co., London, 1956.

Köhler, O.: "The Ability of Birds to 'Count,'" *Bull. Anim. Behaviour*, 9:41, 1950.

CULTURAL TRADITION IN MONKEYS:

Dobzhansky, Th.: *Mankind Evolving, The Evolution of the Human Species*, Yale University Press, New Haven, Connecticut, p. 212, 1962.

EMOTIONAL BONDS:

Harlow, H. F., and Zimmermann, R. R.: "The Development of Affectional Responses in Infant Monkeys," *Proc. Amer. Philos. Soc.*, 102:501-9, 1958.

Huxley, J. S.: "The Courtship Habits of the Great Crested Grebe, etc.," *Proc. Zool. Soc.*, p. 492, 1914.

THE PSYCHEDELIC REVIEW

- Scott, J. P.: "Critical Periods in the Development of Social Behavior in Puppies," *Psychosomatic Medicine*, 20:42, 1958.
- Bowlby, J.: "Maternal Care and Mental Health," *Bull. World Health Organization*, 1951.
- Bowlby, J.: "An Ethological Approach to Research in Child Development," *Brit. J. Med. Psychol.*, 30:230, 1957.
- Bowlby, J.: "The Nature of the Child's Tie to His Mother," *Int. Jour. Psychoanalysis*, 39, Pt. 5, 350-373, 1958.

ORIGINS OF ART, ETC.:

- Rensch, B.: *Homo Sapiens: vom Tier zum Halbgott*, Göttingen, 1959.
- Huxley, J. S.: "Origins of Human Graphic Art," *Nature*, 149:637, 1942.
- Marshall, A. J.: *Bowerbirds*, Clarendon Press, Oxford, 1954.
- Morris, D.: *The Biology of Art*, Methuen & Co., London, 1962.

EXCEPTIONAL INDIVIDUALS:

- Hinde, R. A., and Fisher, J.: "Further Observations on the Opening of Milk Bottles by Birds," *Brit. Birds*, 44:306, 1952.
- Marshall, A. J.: *Bowerbirds*, Clarendon Press, Oxford, 1954.

ORIENTATION MECHANISMS:

- Thorpe, W. H.: *Learning and Instinct in Animals*, Methuen & Co., London, p. 326, 1956.
- Matthews, G. V. T.: *Bird Navigation*, Cambridge University Press, 1955.

POTENTIALITIES:

- Adamson, Joy: *Born Free*, Collins, London, 1960.
- Adamson, Joy: *Living Free*, Collins, London, 1961.
- Carr, N.: *Return to the Wild*, Collins, London, 1962.
- Maxwell, G.: *Ring of Bright Water*, Longmans, London and New York, 1960.

MORPHISM:

- Fisher, R. A.: *The Genetical Theory of Natural Selection*, Clarendon Press, Oxford, 1930.
- Fisher, R. A., Ford, E. B., and Huxley, J. S.: "Taste-Testing and Anthropoid Apes," *Nature*, 144:750, 1939.
- Huxley, J. S.: "Morphism and Evolution," *Heredity*, 9:1, 1955.

PSYCHEDELIC DRUGS, SCHIZOPHRENIA, ETC.:

- Huxley, A. L.: *The Doors of Perception*, Harper, New York, 1954.
- Hoffer, A., and Osmond, H.: *The Chemical Basis of Clinical Psychiatry*, Charles C. Thomas, Springfield, Illinois, U.S.A., 1960.
- Hoffer, A., and Osmond, H.: *Journal of Neuropsychiatry*, 2:306-370, 1961.
- Ropp, R. S. de: *Drugs and the Mind*, St. Martin's Press, New York, p. 182, 1957.

PSYCHOMETABOLISM AND POETRY:

- Lowes, J. L.: *The Road to Xanadu*, [Rev. ed.] Boston [etc.] Houghton [pref. 1930] Vintage Books, New York, 1959.

The Treatment of Alcoholism With Psychedelics

The recent discovery and application of psychedelic substances such as psilocybin, LSD, and mescaline in the treatment of chronic alcoholics represent a promising new approach to this major social problem. Four studies on the treatment of alcoholics with psychedelics will be reported and summarized (1, 2, 3, 4). All of these studies were conducted in Saskatchewan, Canada, in various hospital settings and by different researchers using reasonably good controls and follow-up methods.

The patient-populations in these studies varied somewhat among each other in terms of different psychopathological diagnostic categories. Typically, only the most difficult cases of chronic alcoholism were selected for study and treatment with psychedelics — patients who had undergone various forms of treatment over the years, including membership in Alcoholics Anonymous, without benefit.

The procedure employed in these studies generally used a single massive dose (200-1500 μg) of LSD in one treatment session. (In one of the studies the patients had the option of further sessions, if needed.) The patients were prepared for the ingestion of the psychedelics through individual psychiatric screening, medical examination and individual and group discussions about the nature of the drug experience. The period of preparation varied from study to study, lasting from two days to two weeks.

The patients spent the day of the "session," or drug treatment, in the hospital where the drugs were administered. The physical setting was carefully prepared to give the patients a sense of esthetic enjoyment. The drugs were administered to each patient individually, with trained personnel and one of the researchers in attendance. All

THE PSYCHEDELIC REVIEW

the reports emphasized the importance of the investigators' previous personal experience with the psychedelic substances to further the understanding and rapport with the patients.

Interviews were conducted at the height of the drug-experience and following the subsiding of the effects. For several days or weeks after the experience, the patients had an opportunity to discuss their experience with a psychiatrist or in a group.

For an average period of about one year the patients were followed up directly, or through Alcoholics Anonymous, for an assessment of the treatment effects. It should be noted that other forms of therapy such as occupational and recreational therapy, as well as superficial forms of psychotherapy, were employed in addition to the administration of the psychedelic substances. The major emphasis, however, was on the drug experience and was clearly so perceived by the patients.

The results of the treatment were assessed through ratings of the patient's behavior in terms of the following classification:

- 1) Much Improved — Complete abstinence for the assessment period.
- 2) Improved — Reduction in alcoholic consumption which was confirmed by objective observers.
- 3) Unchanged — No difference in drinking behavior observed.

Tables 1 and 2 list the combined results of the studies.

Table 1:

Results of Treatment of Chronic Alcoholics with Psychedelics

	Number of Patients	Much Improved	Improved	Unchanged	Lost for Follow-up
Study I ¹	24	6	6	12	—
Study II ²	16	10	5	1	—
Study III ³	61	30	16	15	—
Study IV ⁴	58	34	7	13	4
Total	159	80	34	41	4

The Treatment of Alcoholism With Psychedelics

Table 2:

Results of Treatment of Control Group which Received No Psychedelics under Otherwise Identical Conditions⁵

	Number	Much Improved	Improved	Unchanged	Lost for Follow-up
Group I ⁶	35	4	4	9	18
Group II ⁷	45	7	3	12	23
Total	80	11	7	21	41

The results indicate that psychedelic drugs seem to be effective agents for behavior change in the treatment of chronic alcoholics who had been recalcitrant to any other form of treatment. Inspection of Tables 1 and 2 shows that the patients who were treated with psychedelic drugs show significantly more improvement than the patients in the control groups, who received no drugs. Of the patients who received psychedelic drugs, 72% (114 out of 159) were judged improved after one year, as contrasted to 46% (18 out of 39) who were followed up in the control groups.

The authors give various interpretations of their results on the basis of increased "self-awareness" and "self-acceptance" because of the drug experience. More research is needed to validate further the effectiveness of the psychedelic substances in the treatment of chronic alcoholism. But the beginnings, as reported above, seem very promising.

— The Editors

¹ Colin M. Smith, A new adjunct to the treatment of alcoholism: The hallucinogenic drugs. *Quart. J. Stud. Alcohol.*, 19, 406-417, 1958.

² N. Chwelow, D. B. Blewett, C. M. Smith, and A. Hoffer, Use of *d*-lysergic acid diethylamide in the treatment of alcoholism. *Ibid.*, 20, 577-590, 1959.

³ J. Ross MacLean, D. C. MacDonald, Ultan P. Byrne, and A. M. Hubbard, The use of LSD-25 in the treatment of alcoholism and other psychiatric problems. *Ibid.*, 22, 34-45, 1961.

⁴ Sven E. Jensen, A treatment program for alcoholics in a mental hospital. *Ibid.*, 23, 315-20, 1962.

⁵ Data from Sven Jensen.

⁶ Patients who received group therapy without LSD; they were "medically unfit" or refused LSD therapy.

⁷ Patients who received individual treatment; identical conditions as patients in Study IV, Table 1.

Some Comments Concerning Dosage Levels Of Psychedelic Compounds For Psychotherapeutic Experiences

GARY FISHER

SUGGESTIONS FOR DOSAGE are best made for initial experiences, since an individual's receptivity and sensitivity to drugs is so variable that only experimentation with various dosages can determine for any individual the amount of drug that he will require for any particular experience desired. At the outset it should be made clear that this writer does not consider dosage to be the crucial factor in the experience the subject will have. Factors such as the individual's fear of self-exposure; his need to maintain a favorable impression of himself at all times; his willingness to learn; his ability to "go with" changing states of consciousness; the rigidity of belief patterns; the amount of insecurity about his personal worth; his preparation and intent as he goes into the session; his trust in individuals in general and particularly his confidence in the people with him; the wisdom of those who share the experience with him; and the persistence with which he defines himself — all these factors, and many more, are the crucial ones in determining the kind of experience an individual will have with the psychedelic compounds.

In spite of such a host of conditions, however, we have found that dosage does help or hinder the operation of these factors. Another word of caution: a particular dosage does not guarantee a particular reaction. The variability of response to the drugs is enormous, largely because what is most important for a particular person to learn at a particular time will vary tremendously, and thus the experience will differ accordingly.

The comments here offered concerning dosage are considered an integral part of the philosophy of psychedelic treatment outlined

Dosage Levels of Psychedelic Compounds

elsewhere (e.g., Blewett & Chwelos, 1958; Chwelos, Blewett, Smith and Hoffer, 1959; IFIF, 1963; Leary, 1962; MacLean, MacDonald, Bryne & Hubbard, 1961; Savage, Terrill & Jackson, 1962; Sherwood, Stolaroff & Harman, 1962; Van Dusen, 1961; Watts, 1962). Briefly, the treatment philosophy has as its goal a radical change in personality structure, with attendant changes in values, goals, motivation, beliefs and behavior. This sought-for change is characterized by the individual's developing an attitude toward himself which enables him to begin to experience himself and the world about him in a positive, creative manner in which he assumes total responsibility for his own state of being. Sherwood, Stolaroff & Harman (1962) state:

The concept underlying this approach is that an individual can have a single experience which is so profound and impressive that his life experiences in the months and years that follow become a continuing growth process. . . .

There appears to emerge a universal central perception, apparently independent of subjects' previous philosophical or theological inclinations, which plays a dominant role in the healing process. This central perception, apparently of all who penetrate deeply in their explorations, is that behind the apparent multiplicity of things in the world of science and common sense there is a single reality, in speaking of which it seems appropriate to use such words as infinite and eternal. All beings are seen to be united in this Being. . . .

Much of the "psychotherapeutic" changes are seen to occur as a process of the following kind of experience:

The individual's conviction that he is, in essence, an imperishable self rather than a destructible ego, brings about the most profound reorientation at the deeper levels of personality. He perceives illimitable worth in this essential self, and it becomes easier to accept the previously known self as an imperfect reflection of this. The many conflicts which are rooted in lack of self-acceptance are cut off at the source, and the associated neurotic behavior patterns die away. (p. 77)

It must be remembered that the impressions conveyed concerning the efficacy and characteristics of the various drugs come from the writer's experience with them and contain all the biases and prejudices inherent in any clinician's working model. The material is presented in the spirit of sharing experience gained in working with the psychedelic compounds in order to offer guideposts to those new in the field, and to offer the experienced some additional information on dosage and on technique of treatment.

THE PSYCHEDELIC REVIEW

Pre-treatment medication:

If the session is to be run in the morning and if the subject is particularly apprehensive, it is wise to give him some mild bedtime sedative. The main reason for this is to prevent a restless and fitful night where he remains in a twilight sleep and where the cortical activity is very fast and fragmented.

We have found it wise for the individual to eat very lightly the day before his session and to have an especially light dinner the evening before the session day. If he can spend this day quietly, in peaceful surroundings with his guide (guru, therapist) and session mates, this is excellent. The subject should not eat the morning of the session, and he should also abstain from juices and coffee.

If the subject is apprehensive in the morning, and if this apprehension persists or is unusually severe, the subject should be instructed to take early morning medication. We have found librium to be a very useful drug at this stage. It should be noted that it is highly improbable that an individual will not have some degree of anxiety preceding a first psychedelic session. Indeed, in this writer's experience, it is only the very chronically psychotic individual who will show no demonstrable anxiety prior to a session. What is specifically referred to here is undue anxiety which is debilitating and which interferes with the functioning of the individual to the extent that a snowball phenomenon is initiated, wherein he becomes anxious and his anxiety makes him more frightened until he loses all perspective about the forthcoming experience. When this occurs, or it seems likely to occur, we have found it most effective to abort the reaction by early medication with librium. The dosage depends on the individual's sensitivity to drugs. Our usage of librium has been from 10 mg to 35 mg. A person's sensitivity to drugs can be roughly gauged by his sensitivity to other drugs. For instance, some people need $2\frac{1}{2}$ grains of aspirin to ease a headache whereas others need 15 to 20 grains. Individuals' sensitivity to drugs varies tremendously. For example, given an equal amount of psychological rigidity and resistance (clinically estimated), we have seen two individuals vary in drug requirements by a ratio of 1 to 10 (e.g., one individual being able to have a certain degree of experience with $25\mu\text{g}$ LSD, whereas his clinically controlled partner required $250\mu\text{g}$).

If the individual does not have undue anxiety in his early morning hours, we then recommend giving 10 mg to 20 mg librium as the first drug in the session. Ten to fifteen minutes later 5 mg methedrine

Dosage Levels of Psychedelic Compounds

is given, followed 20 minutes later by psilocybin. The dosage of psilocybin again varies, but our range for first session experience has been from 6 mg to 16 mg. Twenty minutes following the administration of psilocybin, LSD-25 is given. Again the dosage varies, but the most effective range we have found is from 300 to 500 μg . The effect of this staggered dosage is to ease the subject gently into the state of fluid expanded consciousness. One of the effects of librium is to relax the musculature so that any somatic effects the subject begins to have from the psilocybin will not be imposed on a rigid, tense and therefore painful musculature system. If the body can become relaxed, loose, pliable and comfortable, then any somatic effects that emerge from the psychedelics will be experienced in a comfortable soma which will lead to an acceptance of these effects, rather than a resistance to them which would occur in a tense organism. Resistance results in the experiencing of pain, either somatically or psychically. When the organism is in a fluid state, impinging or emerging somatic changes take place and are experienced in this pleasant somatic setting. One very effective technique is to massage the individual early in the session. With quiet, relaxing music, soft lighting and comfortable, secure session mates, a very slow, deliberate body and head massage brings the individual into a relaxed, protective and nurturing environment, in which alarm and panic are hard to manufacture.

The methedrine serves to stimulate and activate the individual in this warm setting. Some individuals respond with too much thought activity to amphetamines, and if this can be determined prior to the session, then the methedrine should be omitted. With most people, however, this small amount of methedrine serves to produce an effect of heightened interest and fascination with the panorama of experiences that begin to come into consciousness. We have found the use of psilocybin prior to LSD to be beneficial in that psilocybin has a smooth, mellow, affectual tone. The initial effects are subtle, more gradual and more manipulatable than LSD. These techniques are all in the service of minimizing the likelihood of the individual's becoming overwhelmed too quickly with his changing state of consciousness, attempting to abort the reaction and becoming panicked when he is unable to do so. *Every precaution should be taken so that the individual does not attempt to shut off the developing consciousness expansion.* By the time the LSD begins to take effect, the individual has become relaxed, has begun to enjoy the increased sense perceptions and has become fascinated with the world of awareness

THE PSYCHEDELIC REVIEW

that is beginning to open to him. The deep and profound experiences released by the LSD then flow uninterrupted, in an ever widening scope.

Adding drug during the session:

We have experimented with boosting with various drugs and with various dosages and time intervals. To date, our recommendation is that, given an initial adequate dosage, boosting is to be avoided. The primary reason for this attitude is as follows: the individual will learn first what he needs to learn first, and boosting is often the result of a prejudiced set of the guide as to what the subject should be learning or experiencing. Secondly, boosting often indicates to the subject that it is the drug, after all, that is going to do the work (an attitude which we believe is to be avoided at all costs) and that the guide has lost faith in the individual's ability to work out his own resolutions to his conflicts and problems. Another important facet is that the individual often will take a stand early in the session concerning what he is willing and what he is not willing to do, and will stick to it despite efforts of the guide and despite boosters. Often this taking of a stand or position and sticking to it is a very important experience for the subject as he learns so deeply what and where his commitments get him, and has the opportunity to translate this experience into daily living so that he can see the fruits of his daily attitudes.

If the guide decides to boost, however, then we recommend that he use *at least as much as the initial dose of LSD* and that the boosting be done within the initial three hours. That is, if the individual has been given 350 μg LSD, then he should be boosted with an additional 350 μg , and it is preferable that it be given i.m. In our experience it is expedient to give a booster if the individual becomes completely entangled in an area in which he is in a circular bind wherein he is incapable of perspective and of conceiving any alternative solutions to his conflict. This usually involves some decision-making in which the individual sees that all old attitudes and patterns of behavior leave him with unsatisfactory solutions. In these cases the individual simply bounces from one old reaction pattern to another, without benefit. The solution is then outside the person's limit of entertained possibilities. In these cases, additional drug may be helpful to get him out of his bind, so that heretofore unimagined answers are forthcoming. Some experimenters who have had experience using dimethyltryptamine in these instances

Dosage Levels of Psychedelic Compounds

where additional drug is indicated, state that the use of this drug in quantities of 50 mg to 60 mg i.m. is very effective.

We have also found it useful to give librium when the individual gets into extreme states of agitation which pyramid, and from which there is no release — in terms of time, we would consider 40 to 50 minutes of extreme agitation and distress to be beyond the point of therapeutic usefulness. Librium used i.m. in dosages of from 50 mg to 100 mg is very helpful in allaying the extreme agitation and anxiety without bringing the individual out of the consciousness-expanded state. Librium in this respect is better than thiorazine, the latter to be used when one wishes to terminate a session. This writer has found it necessary to terminate sessions on infrequent occasions. Dosage of from 25 mg to 100 mg is usually sufficient.

We have also found it helpful to use both librium and methedrine in the latter phases of sessions. Sometimes after a thoroughly exhausting emotionally charged session, it is difficult for the individual to orient himself to various "levels" of experience and phenomena, especially to the level of "usual" consciousness. Individuals may go from one level to another quite rapidly, trying to understand or rationalize these various levels, but to no avail, since the endeavor is premature. At these times we have found it helpful to use methedrine in dosages of 5 mg to 10 mg. This has the effect of smoothing out the experience and keeping the individual in a more expanded consciousness state for a longer period of time and with a gradual lowering of this expanded consciousness over an extended period. When the individual is becoming more integrated in his experience, we then use librium again in dosages from 10 mg to 25 mg as a relaxant and for a gradual soothing and calming effect. Often if there has been somatic tension during the day, this dosage of librium helps to loosen up, relax, and make the individual more comfortable.

Use of Psilocybin:

It is this author's opinion that it is not desirable to begin an individual's psychedelic experiences with psilocybin. The reason for this is that psilocybin does not have as great a potential as LSD for breaking through the resistances to expanded states of consciousness. It is best to use the most potent material available to increase the probability that an individual will be able to overcome his resistance and attain a state of cosmic (expanded) awareness. Psilocybin, al-

THE PSYCHEDELIC REVIEW

though a powerful psychedelic, does not have the breadth of power of LSD. The experience of getting involved and encumbered with one's old, inadequate, value system or uncreative basic assumptions about life is to be avoided, and the most powerful agent to break these attitudinal sets is to be used when available. Dosage requirements are always to be viewed against this philosophical framework. If LSD is not available for an initial psychedelic experience, dosages of from 50 mg to 70 mg psilocybin are recommended. For initial psilocybin experiences following LSD experiences, dosages of 15 mg to 30 mg are usually sufficient.

Use of Mescaline:

Since this writer has had limited experience with mescaline, the reader is referred to Unger's (1963) review for detailed information. Low dosages of mescaline are considered to be in the range of from 100 mg to 200 mg, whereas for a standard psychedelic experience, dosages from 500 mg to 800 mg may be used. Dosages in excess of one gram are to be avoided because of toxicity. When mescaline and LSD are used together, the recommended dosage is: 200 mg to 400 mg mescaline with 100 μ g to 300 μ g LSD. Opinion differs with respect to the subjective effects of mescaline: some find it smoother, more mellow and giving a more prolonged descending experience than LSD, whereas others find it harsh, rough and producing unpleasant somatic effects.

Unger (1963) states:

Although the conclusion was delayed by both dissimilarities in their chemical structure and differing modes of introduction to the scientific community, it is now rather commonly adjudged that the subjective effects of mescaline, LSD-25, and psilocybin are similar, equivalent, or indistinguishable. (p. 112)

That the gross subjective effects are similar, no one would dispute. But it is this writer's impression that there are many distinguishing subjective differences among the drugs. Unger's conclusion stems mainly from experimental subjects who had limited experience with each drug. In those subjects who have had considerable experience with all three drugs, it is commonly reported that, rather than being indistinguishable, there are many distinctive experiential characteristics of each drug. This writer is not familiar, however, with any research where experienced subjects have attempted to specify which of the psychedelics was given to them in a blind trial.

Dosage Levels of Psychedelic Compounds

Table 1 gives dosage levels (low, standard and high) and lethal dose for the drugs, LSD, psilocybin and mescaline.

TABLE 1
Dosage Levels for Some of the Psychedelic Compounds

Drug	Low Dosage	Standard Initial Psychedelic Experience	Highest Known Given to Man	LD 50 mg/kg*
LSD	25 μ g - 75 μ g	300 μ g - 500 μ g	1600 μ g	Mice: iv 50 Rats: iv 16.5
Psilocybin	2 mg - 8 mg	20 mg - 40 mg	120 mg	Mice: iv 285
Mescaline	100 mg - 200 mg	500 mg - 800 mg	1500 mg	Mice: ip 500

*LD 50 mg/kg: Median Lethal Dose; 50% of subjects expire with this dosage expressed in milligram per kilogram of body weight.

Use of small dosages with experienced subjects:

This writer has often noted that experienced subjects tend to restrict themselves to a dosage level which they have found will induce a psychedelic experience. It is our opinion that this level is often unnecessarily high, and we suggest that experienced individuals experiment with smaller dosages. It is common experience that a subject finds that he needs a smaller amount of material to induce a psychedelic experience after he has had a few experiences with the larger dosage levels. However, individuals will often continue to use dosages of from 100 to 200 μ g LSD. It is hypothesized that as dosage is decreased, variables of the environment and the clarity of mind prior to the session become increasingly important. Consequently, prior to small dosage sessions, a period of meditation is highly useful to enable the individual to relax and to clear his consciousness of irrelevancies. Dosages as low as 10 μ g to 25 μ g LSD or one mg to two mg of psilocybin have been found to produce rather amazing states of expanded consciousness.

THE PSYCHEDELIC REVIEW

Use of small amounts of drugs for an initial experience:

One approach to be used with very anxious and frightened subjects will now be discussed. This approach can be used with any individual, of course, but with the majority of individuals it is not necessary and not even desirable. The main disadvantage of this approach is that it can build up resistance and make the desired breakthrough into cosmic consciousness more difficult. If, however, an individual is extremely apprehensive or frightened at the prospect of the psychedelic experience, and yet psychedelic treatment is indicated, small amounts of drug in a specially created atmosphere can be most helpful. Dosages of from 25 μg to 75 μg LSD are suggested, and for some subjects who are extremely drug-sensitive, even smaller amounts may be used. The idea is to create a hypnotic-like atmosphere in which the subject thoroughly enjoys himself and begins to experience his sense modalities to their fullest possible limits. It is better with this approach to have the subject with just one guide, rather than the two or four session mates employed with the larger dosages. This guide is very active in producing and directing a comfortable, relaxed and enjoyable experience. There should be absolutely no interruptions, and the subject should be assured of this before the session begins. Special attention is paid to the decor of the room, with soft lighting and pastel shades predominating. A simply appointed room with selected objects is best. These objects are selected according to their artistic and aesthetic value. Objects with various combinations and values of color, shape and texture should be selected. Objects which have been found to be most useful are: a single flower (a red rose, a pansy, a sunflower, a violet), fresh fruit (one orange, one banana, one nectarine, a small bunch of grapes), whole grain bread and cheese. Music, of course, is most useful, and attention should be paid to the subject's favorite selections and composers. The music of Wagner, Sibelius, Saint-Saens, Richard Strauss, Liszt, Chopin, Mozart, Tchaikovsky, Mahler and Grieg is suggested. Other forms of music are also very helpful for mood change, such as Indian music, progressive jazz, Gregorian chants, Negro spirituals and the Blues. Simple figurines are useful — some made from wood and others from stone. Delicate perfumes and incense can be employed, and precious jewels are excellent. A variety of textures should be made available to the subject. Laura Huxley's record, mentioned in her book, *You Are Not the Target*, is an especially good one to play during the session, as she creates a beautiful, ecstatic and safe world for the

Dosage Levels of Psychedelic Compounds

psychedelic voyager to explore. Any stimulus which will enhance the subject's completely experiencing his senses should be employed.

The guide presents these objects to the subject and helps to call his attention to the beauty of each object. In this respect it is very beneficial for the guide to take a small amount of the drug himself so that his state of expanded awareness can be shared by the subject. The guide's enjoyment of his surroundings entices the subject into the guide's world, and the more the guide is able to reach a state of ecstatic wonder, the more he can share experiences available to the subject. The guide goes about to create a state of beauty and delight to the subject—with any method at his disposal.

Somatic changes can be dealt with by having the subject communicate their first occurrence to the guide, who then suggests, perhaps in a hypnotic-like manner, that the subject gently, then thoroughly, experience these sensations as pure sensation and take the label off the sensation (e.g., pain) and simply experience it as it is. In this way the subject ceases to resist the somatically experienced sensations, and they then become delightful phenomena and cease to be painful. (Pain, either physical or psychical, is always caused by resistance to some naturally occurring phenomenon.)

The purpose of the whole experience is for the person to *learn* to experience himself and the things about him with fulfillment and joy. Having a good time and experiencing beauty *is* therapeutic. This approach is to help the individual to release his tensions, to experience his body in a delightful way, to enjoy music, to see vivid colors, to absorb works of art, to eat fruit and bread, to look at trees, flowers — to be in awe of beauty. This is a good introduction to psychedelics. It is a good introduction to one's guide in a sharing experience. In this setting the guide must be an active participant, a constant companion, and a directing initiator into pleasant and beautiful experiences.

REFERENCES

- Blewett, D. B., and Chwelos, N., *Handbook for the Therapeutic Use of Lysergic Acid Diethylamide-25: Individual and Group Procedures*. Mimeographed, 1958, Saskatchewan. (In press.)
- Chwelos, N., Blewett, D. B., Smith, C., and Hoffer, A., Use of d-lysergic acid diethylamide in the treatment of alcoholism. *Quart. J. Stud. Alcohol*, 1959, 20, 577-590.

THE PSYCHEDELIC REVIEW

- Huxley, A., *The Doors of Perception*. N. Y.: Harper, 1954. (Reprinted 1962, with Huxley's *Heaven and Hell*, Harper Colophon paperbacks; hardcover edition, early 1964.)
- Huxley, L. A., *You Are Not the Target*. Foreword by A. Huxley. N. Y.: Farrar, Straus & Co., 1963. (The record titles, "Rainbow Walk" and "Your Favorite Flower," are part of a series available from: Recipes for Living and Loving, Columbia Special Products, Box 500, Pico Rivera, California.)
- IFIF, *Tibetan Manual for Ego-Transcendent Experience Using Psychedelic Substances*. "Psychedelic Monographs," No. 2, 1963. (In press.)
- Leary, T., How to change behavior. In Nielsen, G. S., ed., *Clinical Psychology*. Proc. 14th Session, Intern. Congr. Appl. Psychol., Vol. IV. Copenhagen: Munksgaard, 1962. [To be reprinted January, 1964, in Bennis, W. G., et al., eds., *Interpersonal Dynamics*. Essays and Readings on Interpersonal Actions. Homewood, Ill.: The Dorsey Press.] Also available from *The Psychedelic Review* as a special offprint, together with Huxley, A., Visionary Experience.
- MacLean, J. R., MacDonald, D. C., Byrne, U. P., and Hubbard, A. M., The use of LSD-25 in the treatment of alcoholism and other psychiatric problems. *Quart. J. Stud. Alcohol*, 1961, 22, 34-45.
- Savage, C., Terrill, J., and Jackson, D. D., LSD, transcendence and the new beginning. *J. Nerv. Mental Disease*, 1962, 135, 425-439.
- Sherwood, J. N., Stolaroff, M. J., and Harman, W. W., The psychedelic experience — a new concept in psychotherapy. *J. Neuropsychiatry*, 1962, 4, 69-80.
- Unger, S. M., Mescaline, LSD, psilocybin, and personality change: A review. *Psychiatry*, 1963, 26, 111-125.
- Van Dusen, W., LSD and the enlightenment of Zen. *Psychologia* (Kyoto), 1961, 4, 11-16.
- Watts, A. W., *The Joyous Cosmology*. Foreword by Leary, T., and Alpert, R. N. Y.: Pantheon, 1962.

Four Psilocybin Experiences

[Phenomenological accounts of spontaneous or induced transcendent experiences are valuable source material for the psychology of consciousness expansion. Each account is different. The range of experiences is as wide as the range of human temperament and outlook.]

Of these four accounts, the first, by Frederick Swain, describes an experience with the original Sacred Mushroom, in Oaxaca.¹ It is interesting to compare the Mazatec Indian ritual with the modern rituals of experiment and therapy. // The second is by an artist who took synthetic psilocybin in a "naturalistic" experiment. // The third is by a graduate student in psychology who participated in the same series of experiments. In addition to the perceptual changes reported in the previous statement, many interpersonal aspects of the experience are emphasized in this account. // The fourth account was written by a prison inmate who took part in an experimental rehabilitation program that used psilocybin.]

I

Primitive religious rituals have always fascinated me, and I have sought them out in my travels whenever possible. A few years ago I heard of the discovery of a new hallucinogenic mushroom in Mexico by the mycologist, R. Gordon Wasson. The religious rituals woven around the mushroom captured my imagination. I decided to investigate at the first opportunity. It was not till last fall that the opportunity suddenly came. I found myself in Mexico hunting for this mushroom, unfortunately with little knowledge of its nature, other than the meager information that it produces strange visions when eaten. I knew also that this species of mushroom grows in the mountains of southern Mexico, and that there is a Curandera (or Shaman) in the village of Huautla de Jimenez who performs religious mushroom rituals.

I went to Mexico City with the hope of obtaining more detailed information before continuing on to the mountains. But those who might have knowledge of the mushroom at the University of Mexico were on vacation. A professor who had experimented with it at the Institute of Anthropology was in Europe. I could not find anyone who had even heard of the mushroom. So I was forced to start out alone by bus to the village, which I located on a map, in the Sierra Mazatec range in the state of Oaxaca.

After a long day's ride we arrived at the town of Tehuacan, where I had to give up my bus for a broken-down outmoded public carrier, loaded with

¹ This account was first published under the title "The Mystical Mushroom" ("El Hongo Místico!") in *Tomorrow*, Vol. 10, No. 4 (Autumn 1962), pp. 27-34. The permission of author and publisher to reprint this article is gratefully acknowledged.

THE PSYCHEDELIC REVIEW

vegetables and chickens as well as people, which took us to the village of Teotitlan in the foothills of the Sierra Mazatec. From that point on there were no regular transportation facilities. If you have ever travelled in the remote areas of southern Mexico, you may appreciate the difficulties I encountered. In Teotitlan there was not anyone who spoke a word of English, and I speak no Spanish. By sign language I located a room in an inn, if such it could be called. The sheets on the sagging bed had been used, so I slept on top of the covers with my clothes on.

The following morning I began the frustrating ordeal of arranging transportation into the mountains. The few people who had jeeps showed no interest and refused to take me. The only one who showed concern over my problem was a young girl. She spent the entire day leading me from one person to another, to no avail. At one point she did arrange to rent a horse for me at 250 pesos, which amounts to twenty dollars. I should have been able to buy the nag for that. But in any case the man decided not to rent the horse after all. The following day the girl arranged with the postmaster to drive me into the mountains in his jeep. He told me by sign language I should be ready at seven o'clock that evening. I could not understand why he wanted to start on such a difficult journey at night; however, I was there at seven sharp. By this time it didn't surprise me that he too had changed his mind. I tried as best I could to convince him he should take me in the morning, but he indicated he had to work the following day.

The next morning, purely by chance, I was walking the streets ready to call the whole thing off when the postmaster appeared, ready to go. He had extra cans of gasoline and two other Mexicans in the back of his jeep. I climbed aboard and off we rode in a cloud of dust. There the girl was, waving and smiling at me, with the sun glistening on her lovely gold teeth. Her feeling for me was obvious, and I was grateful to her.

Soon I learned why it was so difficult to get transportation into the mountains. The paths were narrow and were forever winding upwards, around and over mountains in hairpin turns with drops over the side of the road, 1,000 feet, straight down. Moreover, no one had bothered to inform me that over twenty landslides blocked the route due to the rains. No one had penetrated the mountains for twenty-five days. Huautla de Jimenez had been sealed off from the world.

We of course were the first ones through, but we worked hard for the distinction. The smaller landslides we dug through with shovels. For some we waited while crews of local mountain Indians dug through for us. Others we skirted by building logs and stones out over the edge of the cliff, then gingerly inching the jeep around with only a few inches clearance.

At home in Boston I am considered a reckless driver. But Mexican drivers cannot be imagined by Bostonians. I can assure you I held my breath more than once on this trip. We would sometimes take only a few inches' clearance at full speed. The driver would not even blink an eye. Mexicans are fearless

Four Psilocybin Experiences

in an automobile. But they are good drivers. I have never seen an accident, though I expected them, time and again.

Precipitation was heavy. There were always clouds below and above us. It rained every afternoon. On the map Huautla de Jimenez looked less than fifty miles. But due to the winding roads it was well over a hundred. Finally, late at night we arrived caked with mud and dead tired. The postmaster arranged rooms for us. I must say they were better than the ones in Teotitlan.

The following day I walked through the village to familiarize myself with the surroundings. We were near the highest peak in the Sierra Mazatec. I don't know the altitude, but it seemed around 10,000. This was it. From here there was no place to go, only a few trails leading to the isolated huts of poor Mazatecs. It seemed we were on top of the world. Beautiful and strange trees were everywhere. The village was on the side of the mountain, with valleys below and the mountain peak above. As far as the eye could see in every direction there was nothing but mountain peaks, with the cloud covered sky as a backdrop. The air was clean and cool from the rain and the altitude. I loved Huautla de Jimenez very much.

The Mazatecs, of course, guessed I had come for the mushroom. Why else would a Gringo come to Huautla? No one would ever have heard of Huautla de Jimenez except for the mushroom. It struck them as very humorous. When they saw me coming they would shape their hands in the form of a mushroom and pretend they were eating it. Then they would laugh and slap their knees and throw their arms hilariously around each other. Soon I was the joke of the town. Most of the women and children did not laugh, however, since they were afraid of me. Still other enterprising Mazatecs tried as best they could to separate me from my money. But I did not have very much and I held my own against them. Most of the Mazatecs of this region do not even speak Spanish. I understand Mazateca has four dialects and is not related to any other Indian language. However, I was very fortunate in finding a girl who spoke a little broken English which she learned in a school.

Soon I learned the name of the Curandera who performs the mushroom ritual, Santa Maria Sabina. The Mazatecs pointed to the top of the peak where she lived, overlooking the village. I asked one of the boys to lead me to her house. But he felt too lazy that day for such a long climb and wanted twenty pesos. That seemed like too much money for such a small boy. I decided to find my own way and started up the side of the mountain, following the trails. Now and then I would stop and ask directions, calling out the name of Santa Maria Sabina. The women would run into their huts and close the door. The men would stare at me, while some would point the way. Finally, with my heart pounding from the climb, I reached a point near the top where Mazatecs came out to greet me. They announced that here was the house of Santa Maria Sabina.

Santa Maria Sabina

The hut was only one room, with a dirt floor, thatched roof and mud walls. The household consisted of Santa Maria as the head, three men who were

THE PSYCHEDELIC REVIEW

her sons, three women, and numerous children, all living in the same drafty room. They all slept, ate and lived on the floor. There was a wood fire in the center, without a chimney. The smoke escaped through the sides of the wall, which had many holes and gaps, where mud had fallen away. The damp and chilly wind came from below, up the side of the mountain, over the ridge, through the walls of the hut, and out the other side. No one was ever really warm during the rainy season. The food was unclean and the water was bad. How these poor people managed to survive under such conditions was a mystery to me. However, it was their way of life and they were well adjusted to it. I naturally ignored these external factors. Otherwise I would never have come to know them well or understand their religion. I had come to eat their mushroom. I approached them with warmhearted friendliness for which I was well rewarded. At first they were slightly suspicious of me, but other Americans had been there before. Gradually they became quite friendly.

Santa Maria Sabina was about sixty-five years of age and looked much like any other Mazatec woman. She was humble, reserved, and worked hard at the daily chores with the other women. But I knew she was famed among the Mazatecs as a Shaman. As I watched her closely, it could be seen she had wisdom in her dark eyes, sunk deep behind her high wrinkled cheekbones. She had composure and a quiet contentment which added to her maturity.

I drew from my pocket a picture of a hallucinogenic mushroom. The Latin name is *Psilocybe mexicana* Heim. The Mazatec Indians call it Teonanacatl, meaning "God's flesh." Her eyes brightened and she talked about the mushroom. After watching me closely for a few minutes, Santa Maria indicated she would have the mushroom ritual that night for my benefit. Since nothing more could be said, I went outside and lay under a tree to rest and wait for the night, while the fog rolled up from below and surrounded me.

When night came I reentered the hut and sat close to the fire, while the household ate their dinner. They of course offered me some, and I accepted a little watery soup and some tortillas. It is very easy for a North American to get dysentery. In fact, I did end up with it before I finished the trip. At that time I had not had water for four days, and I was not to have any for another week when I returned to the plains below. As a substitute I drank beer and bottled soda pop. For food I ate only tortillas, beans, and sometimes a little soup.

When their meal was finished, the straw mats were unrolled and the children were put to bed. The women lovingly caressed the children till they fell asleep. Then the three women went to bed, leaving only Santa Maria, the three sons and myself.

In one corner of the hut an altar had been set up, with two long candles and a glass vigil in the center, surrounded by bouquets of flowers. A straw mat was spread before the altar and Santa Maria sat on it crosslegged, motioning for me to sit beside her. The three men sat behind us. The candles were lit. Then she pulled a large bowl of freshly picked mushrooms from under the altar.

Four Psilocybin Experiences

The heads of the mushrooms were brown and rather small, about an inch in diameter. The stems were long and white. She carefully examined the mushrooms, then deposited six in each of three cups which she gave to the three men behind us. She then gave me a cup with ten mushrooms. I was glad to see I got more than six. She then took ten for herself. The mushrooms still had dirt on them from the fields and they had been handled a great deal. I tried to say they should be washed, but no one understood me. So what could I do? I ate them, dirt and all.

Each of us took five to ten minutes to eat the mushrooms. No sooner had we eaten them than the three men behind us began vomiting and spitting. I was surprised to learn this is what everyone is supposed to do. There was a large pan placed to the side of us for that purpose. They all indicated I too should throw up. But I felt no nausea. I didn't feel like it. So I declined the offer. This surprised them and they discussed the matter among themselves. I felt fine, about the same as before I ate the mushrooms. I also felt slightly superior that I did not have to throw up. I noticed Santa Maria did not throw up either.

I asked for more mushrooms, feeling that if I should not have more, Santa Maria would have the good sense not to give them to me. She's supposed to be able to look at you and tell how many you should eat. She looked me in the eye a moment. Then she put eight more mushrooms in my cup. I had eaten five of these when one of the Mazatecs behind us realized how many mushrooms I was eating. He excitedly tapped me on the shoulder, wanting to know the number I had eaten. I counted out fifteen on my fingers. He slapped the side of his head with his hand, as though he were going to fall over. Then the three began saying No! No! No!, meaning I had eaten too many. No one, absolutely no one, eats fifteen of these particular mushrooms, other than Santa Maria. They were really afraid for me. With this information I carefully set aside the other three and did not eat them. But Santa Maria remained undisturbed and said nothing. This was comforting. She sat quietly facing the altar and began chanting. She sang the chants like a canticle, with rich, vibrant and tender tones.

Within half an hour the mushrooms began to take effect. First there were vivid flashing colors. Then a clammy chill came over me and I began shaking. This did not upset me greatly. I expected the mushroom to have some toxic effect. I did not intend to let a few cold chills interfere with the experience, after having come so far. I pulled my collar tight around my neck and sat there, shaking. My joints began to stiffen a little. But then, within fifteen minutes, these toxic effects subsided and I felt wonderful. All the fatigue of the day left me. I felt strong and light of body. My back straightened, and I never felt better. I relaxed and began to meditate on the colors.

The chanting was fascinating, in a rising and falling crescendo. The notes had a crisp freshness about them which carried authority. Intricate art motifs appeared in vivid colors, with a predominance of light blue. But there were also greens and reds in various shades. The motifs unfolded in a long pano-

THE PSYCHEDELIC REVIEW

ramic view. Then they formed a spiral and we travelled down the spiral. Our sense of sound was heightened and we heard distant music.

Of course I cannot be certain, but it seemed to me all five of us were having the same experience. Our consciousness changed many times during the night. It seemed we all changed together. I attribute this to the control Santa Maria exerted over us. The various states of consciousness seemed to vary with the rhythm of her chants. If she changed her timing, our visions changed with it.

The motifs subsided and our surroundings were immediately transformed into a new scene. There was a light, warm, red glow which engulfed us. Then there appeared before us dancing celestial eagle gods, with all their plumage. The vision was not blurred or uncertain. The lines and colors were so sharply focused that it seemed much more real than anything I normally see with my eyes. The dancers were accompanied by a sensitive, ethereal music with a background of drums. The timing was fast, but soft. The eagle gods were exceedingly graceful, fully absorbed in their dancing. They became ecstatic. We too became absorbed with them. It was wonderful.

One thing bothered me. Where was the hut, the altar, the damp ground and the sleeping people? The candles on the altar had been extinguished to heighten the experience. My curiosity aroused, I took a match from my pocket and lit it to look around. Everything seemed to be in order. As I put my mind on the hut it came into focus. But the vision of the dancers also remained. Somehow the two worlds seemed to intermingle. If I concentrated on the hut, it was predominate. But if I concentrated on the vision of the dancers, my awareness of the hut receded. Or, if I wished, I could maintain a balance of the two. I seemed to have control of my will and intellect. I was able to point my mind in any direction I wished. However, I felt my mind in turn was influenced by the emotional content of the visions, much in the same manner that emotions influence the mind in normal circumstances.

I then turned the match towards Santa Maria. What a surprise! She seemed transfigured. Her eyes shone with a glow that seemed to light up her head. She looked thirty years younger. There was not a wrinkle in her face. Her skin was light, clear and almost translucent. Here, at night, she was master of another world, the world of the mushroom. She was regal, absorbed in ecstasy. What a contrast to her miserable existence during the day. She was then a humble, unbelievably poor Mazatec. At night she was a queen in her strange mythological realm. I blew out the match and returned to my vision with enthusiasm.

The dancing soon came to an end and the music stopped. The eagle gods vanished. A new scene quickly took shape. I found all five of us sitting a few yards apart from each other in a semi-circle. We were in the center of a vast, endless desert. We were merely sitting in silence, each absorbed in his own thoughts. I found my own mind grappling with the nature of reality. I felt somehow I was on the verge of a discovery, a new realization which I couldn't quite put my finger on. It was an eerie feeling. Time stood

Four Psilocybin Experiences

still. Gradually the feeling came that we had been sitting there an extremely long time. In fact, it seemed we had always been sitting there. Then instinctively a name came to me from the recesses of my mind, as though I had always known it, the "Land of Eternal Waiting." Yes, it was clear to me that we were waiting there eternally. What we were waiting for, I don't know; but we were definitely waiting.

The memory of my past life began to dim. When was it I lived my life on earth? It seemed many years ago, if I had lived there at all. I began to worry. Would this never end? I certainly didn't wish to remain here forever. What were we waiting for? I was losing my identity. I felt it might be a hypnotic spell. I tried to arouse my memory by recalling the name of my father and close friends. At first the names were dim, out of some distant past. But with effort they returned quite clearly. Still I felt I had lost contact with life on earth. I was really worried. Perhaps I had died from mushroom poisoning without realizing it, long ago. How could I know for sure? Perhaps I really was in the Land of Eternal Waiting.

Silence

Silence had become a part of me. It seemed years since I had spoken. But I roused myself and forced myself to speak. To my surprise the Mazatecs answered in English. I swear it. This really was hard for me to believe. It shook me up a bit. There was some kind of telepathic communication between us. We could understand one another, each in his own language. I was later told it sounded to them that I spoke in Mazateca.

They answered, "Yes, we really are in the Land of Eternal Waiting. This is reality. This is your true abode. Your life on earth never really happened. It was only a dream. You have been sitting here with us all along. You have been dreaming a very long time. Now you are awakening from your dream. You are coming back to reality. We belong here together. This alone is real."

What they were saying seemed strangely true. At first I wouldn't admit it, but I felt this was more real than anything I had ever experienced. Was it really possible? Yes! I concluded, it was possible. This was reality. All else was unreal. I was awakening from a dream. A veil had been lifted. The past was shattered. I kept scratching my head. Wow!

We talked a long while on the subtle nature of reality. They explained it to me with patience and kindness. Normally the Mazatecs are a simple child-like people, absorbed in their struggle for existence. During the day I never detected a tendency for intellectual pursuits. But here in the night with their mushroom, they were concerned with nothing else. They were highly articulate and presented their views with wisdom and insight. They thoroughly convinced me. Finally, we returned to silence.

But still something disturbed me as I sat there. My mind began working overtime. If I were dead to the world, I might as well make the best of it. I figured if I really had died many years ago, my family and friends were

THE PSYCHEDELIC REVIEW

probably dead also by this time. True, I was in rapport with these people and I really seemed to belong with them. But, I would be damned if I would continue sitting there throughout eternity. Is that all there is to do? How foolish can you be? This might be reality, but it was senseless, purposeless. I felt like a fool. I began to get mad, really hot.

I turned to them and shouted, "You're all crazy, and so am I. We're all mad, stark raving mad. We can't sit here like this forever. We're absolutely crazy!" They all politely nodded their heads in agreement and understanding. "Yes! We are all crazy. However, this is reality nonetheless. There is reality even in madness." They had an irrefutable answer for everything. I was finding out even more of the truth, too much of the truth. They tried to soothe me. But I would not be soothed.

I announced I was leaving, there and then, though I didn't know where to go. Only the endless desert lay before me. I stood up to walk away. But my legs were like rubber. I was so wobbly I couldn't take a step. This made me even more furious. I felt I was being tricked.

Under the influence of the mushroom, one's power of concentration is far more pronounced than normally. You become deeply absorbed in whatever you may be thinking. There is no external distraction. You can glue your mind on one thought or one emotion and hold it there as long as you wish, indefinitely if need be. Whatever you do is emotionally intense.

The situation called for drastic action. I really had to get away if I were going to maintain any sort of emotional balance. I threw back my head and willed myself out of that place by sheer force of concentration. It was as though an explosive charge inside of me ignited. I exploded upwards like a rocket, instantaneously, straight up through the sky. The others followed me, as though they were sucked up by the vacuum created by my ascent.

I emerged in some delicate ethereal upper region of space. I found myself standing, calm, collected and free. I was immediately master of myself and my surroundings. The realization quickly came that everything is a state of mind. I am free and master of myself if I will myself so. I am whatever I believe myself to be, if my belief is strong enough. My mind was released from its previous struggle. I felt strength, like a giant. I felt like a god. Yes, this was it, the real moment of truth.

The Mazatecs sat down crosslegged beside each other while I remained standing, deeply absorbed in my realizations. They looked at me and chanted "Santos, Santos, Santos" in unison. This distracted me slightly from my thoughts. I said, "What? What's that? Santos? Who is Santos? Am I Santos?" They answered, "Yes, you are Santos. Now you are coming to know your true self."

They waited a moment for this to sink in. Well, I really began to feel like Santos, whoever he is. I became totally identified with a mental image of Santos which took shape in my mind. It was accompanied by a feeling of ecstasy. I seemed to move automatically, guided not by my will, but by my

Four Psilocybin Experiences

emotions. My emotions overflowed. I felt a Divine rhythm beat in the core of my heart. To express these feelings, I rose on one foot, light as a feather, and turned slowly on my toes. I was not in the least wobbly. I now had perfect physical control. I began to do the eagle dance. I danced with my arms and torso more than my feet. Then I began to chant in Mazateca, and I moved and swayed to the rhythm of my own chanting. It all came about as naturally as breathing the air.

The dance did not take place only in my mind. I really did do the eagle dance with my physical body. At one point I became vaguely aware I was dancing in the mud hut. I could sense and even see many people crowding into the hut. Other Mazatecs in the area were apparently pushing in to watch me. I could see them if I wished, or I could be lost from them in my dance of ecstasy. Their presence did not disturb me as it normally would. I quickly became reabsorbed in my dancing and my identity as Santos, oblivious to all else.

I don't know how long I danced. Somewhere along the way, my chanting changed into a song, all in Mazateca. Now normally there is nothing at all unusual about my voice. It is quite ordinary. But in that state of consciousness, tones came out of my throat which are unimaginable to me, long, sweet, beautiful, exotic tones. The notes flowed out with strength and power, without effort. It is hard to believe, but it did happen. It really did.

The following day I was told my voice carried through the valley below and was heard all over Huautla de Jimenez. Everyone in the surrounding area heard me. Those in the immediate vicinity came crowding into the hut to watch. It must have been quite a performance. As I write this account, I sort of drift off and relive the whole thing.

When my wonderful lovely songs came to an end, I began to lose my feeling of godhood. I changed completely. I became a child. I did not particularly want to be a child, but I became one nevertheless. I felt like a child and acted like one. Finally I lay on the floor like a child crying for its mother. Not its earthly mother, but some kind of Divine Godly mother.

After lying on the floor for some time, I began to return to my normal state of consciousness. The effects of the mushroom then wore off rather quickly. The visions ceased. The transition took perhaps twenty minutes. The only thing which remained was the emotional impact of the experience. My surroundings lost the vivid colors. Everything looked disgustingly normal. I then stood up rather sheepishly, tried to look nonchalant, and lit a cigarette. It was four o'clock in the morning. I had been under the influence of the mushroom for seven hours. Apparently about two hours longer than the Mazatecs, due to the larger quantity I had eaten. Perhaps my experience was more intense than theirs for the same reason. I was not the least tired. Physically, I felt in excellent condition. In fact, I then carried on a full day of activity without any fatigue. I could not detect any ill effect or any form of hangover from the use of the mushroom.

THE PSYCHEDELIC REVIEW

Initiation as a Mazatec

At daybreak, Santa Maria initiated me as a Mazatec. Not as an honorary one, but as an honest-to-goodness Mazatec. She rubbed a green earthy substance into my arms, chanted, and proclaimed me her son. But we could no longer communicate with one another by words, only sign language.

As I descended into the village that day, I found the attitude of the population towards me quite different than the day before. No one made fun of me. Everyone came to me and tried to talk. They would then talk among themselves about me. They would point at me, then put their arms around me. Obviously, they felt I was someone special when it came to eating mushrooms. Even prices came down. Cigarettes were cheaper. Food, beer and the few other items I bought were all a little less than the day before. Yes indeed, these were my people.

After a few days I had to leave Huautla, though I wanted to stay on. I was running short of money and I didn't want to impose on the Mazatecs. The food and lack of good water was beginning to tell on my health. I had no blankets and no equipment. I didn't seem to be of much use in their workaday world. All I was good for was eating mushrooms. And they were running out of mushrooms. So I had to leave, with, of course, reluctance.

I don't recommend the mushroom to anyone, even though they are physically harmless. They are not a narcotic. They are not habit-forming. It is not possible to develop a physiological craving for them. The mushroom season lasts four months, from June to September. The other eight months the Indians do not miss them and go about their normal life. But many people would be terrified at the loss of identity caused by the mushroom. One American I know of became hysterical with fear. Some experience adverse psychological effects and go through horrifying ordeals. Even some Indians are afraid to eat the mushroom. Most people do not even want these states of consciousness. Then even at best, how many people can make a trip to Huautla de Jimenez in the Sierra Mazatec?

But each person responds differently, according to his temperament and psychological makeup. For those who are psychologically attuned to this sort of thing and who seek the hidden depths of the unconscious mind, the possibilities of exploration are unlimited. The variations are endless. One can enter mythological realms and mental worlds undreamed of. I should also add that if one gives spiritual meaning to these experiences, such as the Indians do, the results are far more significant than for one who merely sits down, eats the mushroom and waits to see what happens.

Of course, many people criticize the use of the mushroom as barbaric and primitive. Some consider these states of mind psychopathic. Of course, I agree that if someone did the eagle dance on Tremont Street in Boston, it would be psychopathic. But to do the eagle dance in the dead of night in Huautla de Jimenez is the most normal thing in the world. What we consider psychopathic depends entirely on our social conditioning. I don't feel a moral

Four Psilocybin Experiences

obligation to remain true to the social structure of New England. I much prefer to identify myself with the Mazatecs.

The question also arises as to whether the mushroom creates a pseudo-transcendental consciousness. I don't think the mushroom creates anything. Visions and states of consciousness cannot rise out of the inert chemicals contained within the mushroom. These experiences can only be produced from within the mind. And the mind can only produce what it contains. The mushroom can only act as a releasing agent through its chemical components. I have not studied any scientific papers on the *Psilocybe mexicana* Heim. I can only analyze the mushroom from my own unscientific experience with it. My experience was not intellectual, but emotional. Each person must try it for himself if he wishes to pass judgment.

If anyone can have these experiences without recourse to the mushroom, fine and good. Certainly such visions would be far more desirable if they could be experienced without the help of a chemical releasing agent. The mushroom has its limitations. I certainly do not wish to be dependent on a mushroom for my spiritual life. Its value lies in that it can open up for the first time in vivid panorama that which previously lay hidden and unknown. It can make us deeply aware of our own mystic nature in a way that would not otherwise be possible.

Sometimes, even now, I think perhaps Santa Maria was right when we were sitting in the "Land of Eternal Waiting." Maybe I am still sitting there, dreaming. Perhaps I have only resumed my dream of living in this world. Perhaps my being here is only the product of my imagination. How can I really know? Can we ever be really sure of anything? But if all is a dream, I must say the dream I like best is the one where I shoot up through the sky and become Santos. Man, that's really living.



II

It is difficult to write this type of report because my major way of expressing myself is painting rather than through words. I believe that the experience can be broken down and each part examined by itself, and in that way I can try to present a total idea of what was experienced. Some things now do seem either foolish or unbelievable, but I shall try to be as accurate as possible.

The first thing I will consider will be the visual part of the experience. My vision seemed to broaden and I was able to see everything at once — to see everything totally and never really feel that I was unable to see small details. However, when focusing on a particular object all details became visible — in other words I think that the details cannot be seen in the total but were never missed. When focusing or narrowing the visual field, I was

THE PSYCHEDELIC REVIEW

able to see all details. I was able to concentrate entirely on one object to the total exclusion of all others. The one object would seem to radiate light or glow from within. From time to time other members of the group would take on this glow which would attract my attention, and then I would narrow the gaze. This inner glow for some reason seemed to disappear when that person's reverie was interrupted by someone else's comment. People seemed different from objects, in this regard. After focusing on an object the object would glow, but with people the person could start to glow before focusing on him. All space seemed to be curved, and the importance of verticals and horizontals diminished greatly. I was acutely aware of this because of my extreme interest in the Bauhaus painters and the DeStyle group. I have always felt that the vertical and horizontal orientation was extremely important, but the whole idea seemed to break down. Even the Cubists seemed unimportant. A new arrangement of space seemed necessary. Objects didn't seem to end abruptly but had an ability to extend themselves. This may be partially due to my feeling toward the objects and their feeling toward me at the time.

Color and the reality of space were actually not a new experience to me. It was very similar to the reality of both during a period of high painting excitement. In fact I believe that visual disorders may occur more with slight turpentine intoxication, sometimes referred to as turpentine poisoning, and the lack of oxygen which takes place in the artist's studio (fairly large quantities of oxygen are consumed by the drying of linseed oil and reduce the amount of oxygen present in the air, combined with turpentine vapor; this can and does affect perception). Space itself took on a very real quality and was related in its shape to visual concentration. When looking at an object close at hand, I felt as though I were in a cylinder of space. Space closed in around me but was open at the top. When looking at the total, the corners of the room were unimportant and seemed to curve — the space of the room was not really related to the four walls but was enclosed within them. Once again the top seemed open and the floor uneven. When leaving the room and then coming back into the room, it seemed to have an umbrella-shaped top (mushroom-shaped) which hung below the ceiling. When looking out of the window, there always was a thorough detachment. The space was not as real. Everything was clear and sharp, but not real.

Hearing was also changed considerably. I could hear everything quite clearly — never quite sure where the sound was coming from. Coins jingling in a pocket, keys being rubbed together, someone scratching, and voices, were all of equal importance. Sounds which were ordinarily screened out were from time to time annoying because they could interrupt someone's speech.

Physically I felt extremely well. Here I think it is important to mention that in November I underwent surgery for a rectal fistula. It hasn't, to the present time, healed. This is the first time for me since the middle of October that I have been able to move freely without pain. Naturally that was delightful. It is difficult for me to be certain of whether or not the drug was a real help in this area, but for the past week I have actually felt more comfortable and less worried about this situation. It was a great pleasure to move. I never

Four Psilocybin Experiences

felt that my reactions were slowed or impaired in any way. In fact I really felt much freer in my movement and capable of performing any physical task.

Perhaps the most amazing thing to me was what happened to me when I wanted to express myself verbally. Most of the time I felt that there was no reason to talk. When I felt that something was important to say, I first had to find the words to express the thought. I was really thinking thoughts free from the limits of verbiage. It was then a matter of translating thought into words. Many times when I wanted to say something I would struggle to find the words and by the time I had found them fortunately someone else had said it and I could relax! While many things were not discriminatory, I think that on the idea level I was most discriminatory. Ideas presented by others in the group were either accepted or rejected with intensity. I was either happy at what had been said or extremely annoyed.

Possibly the most important part of the experiment for me was my awareness of a totality and awareness of nothing. Thoughts took on a great reality, and I could sit and enjoy myself thinking. Sometimes the thoughts were so delightful and so real that I would laugh happily over them. While the thoughts took on this reality at the peak point of the experience, I felt that I was able not to think. I could sit empty and then a thought would pulse through my mind. I was never quite sure whether the thought came from — originated — with me or outside me. Many times I felt like a large receiver through which things were passing. I felt as though I were collecting information. This made me extremely happy. My laughter was about this happiness and was not in response to what other people in the room had said.

From time to time a rather petty unimportant disagreement took place between the other people in the room. My immediate response would be to try to take sides, and before I could say anything I would realize how foolish this situation really was and would laugh at myself for having thought of participating in such foolishness.

There were times when I became extremely restless and walked about the room. It almost felt that I could walk away from my physical self. I would walk and then stop walking in hopes that I could continue on. This would happen once or twice, but I was snapped back and never was able to stay outside for any duration — even though I think I would have liked to. This just seemed as though it should follow but never did. I was not afraid. Everything that was happening to me was good. Everything that I touched — everything that I saw.

Several times I was bothered by H. to do some drawings, which seemed to be an invasion of privacy to even think of doing such a thing at that time. What was happening was more important to me than trying to record it. Being was the most important thing, and I didn't want anything to interfere with being. I felt a communion with all things. It was difficult for me to determine whether I was reaching out to all things or whether all things were reaching out to me. I now feel that it must have been a mutual reaching

THE PSYCHEDELIC REVIEW

out because I was convinced at the highest point that the right wall loved the left wall and that all walls loved me. And that I loved them. At this very high point, I seemed to be aware of everything within my view as well as those outside my view. What was behind me was as real as what was in front of me. At one point I am sure that everything came together with me. I became excited at this point — extremely excited. I tried to walk away from myself. At one point I walked from the room to the next, and for a brief moment was outside the house. I didn't feel the cold or the snow. I then found myself back in the house. Walking back into the other room, everything seemed to have slowed down. I sat down, put my head back and closed my eyes. B. put on Ginsberg's recording. With my head back and my feet stretched out, the space for the first time changed its dimension. It flattened out. It felt almost as though my head were above water and my body was in the water — or that my body was not. Ginsberg drifted to me across this level plain, then started to fade. My eyes were closed, and a large black pool started to open up in front of them. I was vaguely conscious at this point that I was almost not breathing, and took several deep breaths. I seemed to be gasping for air. This worried me for a minute, but all was good and I stopped worrying. As the space continued to expand, a small white object seemed to be coming toward me or perhaps I was going toward it — extremely brilliant. As I came closer, I was able to see a red spot in the white. I was very anxious to find out what would happen, and then someone said, "Do you want to listen to this?" and someone else said, "No, take it off" and it disappeared. I remained in this position, trying to get back, trying to find out.

When I came back it seemed to me that I had to think how to breathe, how to get it started. I felt that I had not taken a breath in some time and gasped for air. Once again — not at all worried. The one time during the entire session that I was aware of any taste or odor was when I came back and there seemed to be a strange taste in my mouth and a most unusual odor. I really don't know what it was or how to describe it — the first time I have come in contact with it. I felt that I had to have something to drink. B. obliged.

The plain was gone and I became aware of different parts of my body getting extremely warm, which felt extremely good. No part ever seemed to cool off, just other parts getting warm. After some time this ceased, and I have a feeling that this part of it was over. I opened my eyes. In a way I was surprised to find where I was and began to move about, a little disappointed but quite happy. At this point my head was filled with thoughts — all important thoughts, all private thoughts. I was still extremely happy and would from time to time chuckle to myself about how wonderful it was to be, and how good to know all that I knew. I must confess that this feeling has not left. Many thoughts are still buzzing around, and I am still happy.

After that, I felt physically worn out, extremely tired, but my mind was still very very active. After walking around to my car and driving home, this physical exhaustion left me in about thirty minutes and I felt very good again.

There are, I think, important aspects to what happened to me which have

Four Psilocybin Experiences

extended themselves over a much longer duration of time. My wife and I had made a commitment for that Saturday evening quite some time ago, and we felt obligated to follow through with the engagement. I suppose I was still "high" at that point, but it surprised me how I was able to project to others my feeling that things were good. Several people mentioned that I made them feel very good. Now I think that the most important part of what has happened to me, since the experiment, is that I seem to be able to get a good deal more work done. Sunday afternoon I did about six hours' work in two hours' time. I did not worry about what I was doing — I just did it. Three or four times I wanted a particular color pencil or a triangle and would go directly to it, lift up three or four pieces of paper and pull it out. Never thought of where it was — just knew I wanted it and picked it up. This of course amazed me, but I just relied on it — found things immediately. My wife was a little annoyed at me on Sunday afternoon because I was so happy, but I would not be dissuaded.

When painting, it generally takes me an hour and a half to two hours to really get into the painting, and three or four hours to really hit a peak. Tuesday I hit a peak in less than a half hour. The aesthetic experience was more intense than I have experienced before, so much so that several times I had to leave the studio, and finally decided that I was unable to cope with it and left for good! I now have this under control to some extent, but I am delighted that I can just jump into it without the long buildup, and I certainly hope it continues.

... all these words really don't say it.

III

The first noticeable change came about with regard to strange color effects. The room changed in illumination and, with it, also in feeling-tone, from bright and sharp to glowing reddish and warm. For the first time, I seemed to understand the existential-phenomenological experience of shifts in one's total state of being and the transformation of one's perceptual world as a consequence of this. Everything is pulling together and tightening up, or expanding and receding, with the concomitant change in color perception which leads to or precipitates a diffuse and global experience of warmth or other feeling-dimensions. In addition to this, one sees after-images following movement, and a strong glowing of color or color-radiation. At first, however, there are no hallucinations. It is rather like a fluorescent light which comes from within the eyes of the others or which is penetrating the objects that one visualizes. The light is unsteady and glittering, as if reflected by diamonds or other precious stones in a tremendous variety of very rich colors. Then everything becomes transparent and nebulous, a continuous change and transfiguration. One has the impression of drifting clouds, and gentle flowing and

THE PSYCHEDELIC REVIEW

intermingling of boundaries and substances. All blemishes disappear, and one perceives familiar objects and particularly other faces or movements of limbs in a peculiarly stylized manner, as if the essence or underlying idea were struggling or pressing, rather, to reveal itself.

Next, peculiar boundary shifts enter into one's awareness — definite shifts of perspective. This manifests itself in such a way that the limbs of one's body as well as those of the other people in the room suddenly appear isolated and independent; they glide or soar away and interpenetrate, or coalesce into each other. It is a most striking experience that the vertical and horizontal ordering-principles gently disappear; they slip away, so to speak; the coordinate system vanishes, perhaps the most vivid experience or realization of perceptual change.

Early there is another strange experience. One suddenly feels a kind of reversal of structure of one's head and eyes. It is as if one's skull was suddenly expanding like a balloon being blown up and that a huge spherical hollow was thus created which then served as the stage of visual drama. The eyes appear no longer as looking out from within into the world, but rather they are reversed upon themselves, clinging to the walls of the hollow sphere looking in and moving freely along the total inner surface of that sphere, so that ever new perspectives are opened up and phenomena reveal themselves in thousandfold manifestations at a phantastic speed. One can also feel one's eyelids much like a curtain that can be drawn or let down. One has the experience that one's head is like a cloak of different layers of cloth, like a curtain, which are all in movement, floating before one's visual field so that one can penetrate them. The inside and outside is felt, not as contained within myself, a well-described container or system, but rather out there or in here in a purely directional sense; a visual direction, not a blind orientation, i.e., knowing where one is in our usual experience. One can hold one's head in one's hands, for instance, and suddenly one experiences one's fingers as strangely knocking from the outside of one's face, disconnected and foreign, then elongating and growing into grotesque but friendly, snake-like creatures, or rather creations, as one finds them in Miro or Picasso. Fragments break off, there is constant mutation of parts, which then slide away to the side in a swirling movement, interpenetrating each other. Together with this as a constant accompaniment, one encounters the most luminous colors and patterns, all asymmetrical but beautifully shaped, very "modern" designs. Everything reminded me very intensely of modern graphic art and painting, and I experienced a reassuring feeling of familiarity in this world of Miro, and Picasso's *Guernica*. I had the confident feeling that I really understood the meaning and expression of these modern forms for the first time, understood their origin and shared in the creative act from which these experiences spring. The idea went through my mind: "If I could only fixate these images, if I could only hold them or reproduce them, then I would be able to say exactly what so many have tried to say." I felt that I was at home in a world of which we obtain only sparse glimpses in works of art, and I felt that I had

Four Psilocybin Experiences

discovered the secret of their origin, the source whence all this sprang. It seemed only a matter of skill to pinpoint what I visualized, to bring it on paper or canvas as a most articulate form of artistic expression. The most dominant theme was one of "modernness," and the expression of our own age and future ages.

Another peculiar feature was the conviction I had of the objectivity of these visual forms. They must exist "out there," they must have existence independent of me and my experience. I can participate — better, I can see, reach out, touch them; I have the privilege of being confronted with essences, in tangential transaction with essences. In all of this, now, it may well be that the major factors were the ideas and preoccupations I had prior to the experience, i.e., seeing fragments of Picasso's *Guernica* and being concerned with the notion of the objectivity of values, in a philosophical sense.

The next stage, so to speak, although not directly differentiable because of the extremely fluid boundaries and the elimination of structured spatiality, was an acute loss of time perspective or time-boundness. Past and future faded away, and one was living exclusively and ecstatically in the present, here and now. Time did not flow, no temporal movement — it practically stood still — it felt like glassy warm glue, of heavy viscosity. There was no concern with time, which was most significant of all. It manifested itself in temporary abandonment (objectively speaking) of tasks one set out to do, but forgetting and leaving things unattended to and suspended without remembering, and trying to continue only to become oblivious again of what one was trying to accomplish. Acts or designs were often acutely experienced as ideas, with no potential. One developed an acute inability to act. I wanted to do certain things like getting up and moving to another place or to eat something, but I was unable to accomplish it. Either I was too lazy, unable to move, or the idea in itself was satisfying without realization in action. Phenomenologically, it was not like a traditional motive or wish that one felt, that I wanted to do something; rather, it was more like an idea I had of something which then vanished or oscillated into something else. I did act on occasion, however, and my actions had a peculiarly felt design and purpose. I had to do this and that, there was a certain compulsive quality about it, just this and no other way. Momentarily I became aware of the exclusiveness of the design. I was strangely free, I had only one thought, everything else did not matter at all.

One feature of this is the "power of perception." One seems unable to execute an act like walking over to sit down in another chair, but this is wholly compensated for by merely thinking about it. Seemingly, one does not have to move physically but can just as easily move about "spiritually," to use a crude and ambiguous concept. It appears that one is no longer bound by physical laws of movement, as though one were free to soar or glide through space in some non-material form and leave one's body behind much like a corpse. One has an exhilarated feeling of lightness and freedom from

THE PSYCHEDELIC REVIEW

restriction, as if one were living five feet off the ground and moving like a breeze of air.

I ate grapes and bananas, and they tasted most delicious in a very rich and sensuous way. Chewing and swallowing were intensely pleasurable, and one could really abandon oneself completely in the exploration of this singular sensuous experience, which literally came over one without one's active participation. Everything else was screened out, one was not able to hold more than one thought, image, or feeling in one's consciousness simultaneously. I felt suffused with feeling. Only global differentiations of one's feeling-states, which alternatively took possession of oneself, could be made. I felt sometimes hot, warm, or cool, but never totally unpleasant.

At times I felt that the only problem left in my world was the regulation of temperature in order to maintain this intensely pleasurable, secure, peaceful, permanent, even eternal state of suspendedness in a communion. The means-end thinking dropped out completely. There is a tremendous sense of freedom involved, freedom from different wants, freedom from having to do things, freedom from one's past and future. Things are arranged for one, if one only trusts. Momentarily one might worry about who is there outside our state to keep this going, because I am certainly unable to do so at this time; but these detachments are few and brief. It is more like things happen, one no longer carries plans around in one's head, no designs, no purposes, no goals, just the NOW.

There always seems to be only one — if any — instantaneous purpose, here and now, a sole concern, a single problem, which has to do with the immediate situation, like changing the temperature, one's temperature. It is tremendously difficult to visualize and realize action-patterns, how to go about certain things, because one is so captured by the moment, caught up in the immediate, bathing oneself in sensuous experience from which one cannot remove oneself.

One has a strong sense of communion — one wants to share and to extend the experience for all those present. There arose a very strong feeling of fellowship among the group, a feeling of shared knowledge, experience and privilege. The atmosphere was almost that of a sanctuary. We had made it, we were chosen and rewarded. It was like having reached a safe harbor. This security made everybody present very unthreatening. There was plenty to share, one was in a giving and sharing mood. One could really give oneself without any pretense or reservation. One felt definite kinship and unity with the whole group, which had transcended all kinds of pettiness and earthly worry; one did not need to pretend. Therefore, I felt acutely that I was encountering the people as persons, as they really are, without any distortion of role status or accomplishment. I felt as if I could penetrate directly to everybody's soul. There was a gratifying and reassuring openness about my own feeling, although I still felt not quite able to communicate this openness and acceptance.

Four Psilocybin Experiences

The total atmosphere was definitely paradisaical and heavenly. I had the notion of "this is it," "this is the moment of truth," "I know that everything leads to this," "this is complete harmony and ecstasy." There were moments where the concern was: who will relinquish this willingly in order to continue to take care of things outside this group? More importantly: who will see to it that the state continues, that the ordinary tasks of the world are attended to? There was a singular absence of concern with technical things or with the general problems of civilization. All everyday activities seemed far removed and futile.

I felt that I was unable to take care of anything physically. I could not do anything if, for instance, the fire from the fireplace spread to the whole building. Rather I felt that the conflagration was spreading and that it should spread, and there was a glowing overmeaning in this word of conflagration for me. But there was never a sensation of fear or apprehension for me, or a realization that anything could happen to us. We, and I felt this quite distinctly, were inviolable, we had arrived, we were unified with the ground of being, we were already transfigured, dead and at the same time so intensely alive as never before. I experienced a sense of initiation and participation in a great mystery; everything became knowing and known.

There was an acute awareness of the others in the room, but only when they were present. Most of the time people floated in and out of my experiential horizon. When they were there, they had to be there — it could not be any other way — everything had to be just as it was. There was a surging sensation of appropriateness and "rightness" about everything that went on: it could not conceivably be any other way. Viewing the others, there was an overwhelming and continuous, vibrating, sensuous feeling and expression of ecstasy. There were no visions or desires of actual physical union or even physical contacts but rather a type of spiritual interpenetration — two veils being drawn over each other. The unitive feeling had the power and sensation of a warm shower in which one became completely enveloped. Physical distance was not experienced as such. A glance or visual impression felt like a reaching out and amoeba-like engulfment. One lived in one's glance, one extended oneself in one's visual projection, one lived and travelled with one's eyes and view.

One became acutely aware of facial details, like quivering lips and vibrating noses which signalled the experience of ecstasy and which gave testimony to the universality of one's feelings and the harmonious and parallel, or simultaneous, resonance in this experiential community. One became aware of lips, cheeks, the falling of hair, and eyes which had the most remarkable depth and radiation. Faces became mysterious, stylized, angelic, transfixed, idealized. There was a *double entendre* about every gesture, glance and movement. Everything seemed like a sophisticated and overwhelming "come-on" game, intensely eroticized. The people looked as if they were on stage, acting and

THE PSYCHEDELIC REVIEW

behaving in a slow and deliberate yet overdrawn and stilted manner. The women present changed perceptibly toward ideal pictures or representations of the sensuous temptress or the Madonna. I had the feeling of participating in a very modern drama; all movements were affected and stilted, much like the stalking movements of animals (e.g., pointing dogs) who circle each other, facing in different directions yet acutely and mysteriously centered around a common core of meaning and purpose; engaged and knowing.

I was definitely aware of several levels of communication going on among the people present, strictly according to the degree of previous acquaintance or affinity or familiarity. There was a peculiar experience of areas of limits and liberties — as if a grate of restrictions and freedoms had been laid over the interactions of the people present. A glance was as powerful and as direct a message as the most private and elaborate verbal statement, and, consequently, the direction of looking seemed to move in preordered or guided channels. Particularly the meeting of eyes, the knowing look that binds and draws two people together was governed by the perceived degree of liberties in terms of previous familiarity. The mere observation of others, on the other hand, looking at aspects of others, profiles, hands, and lips — this kind of sensuous, esthetic meditation, (better, contemplation) of the features of others — seemed singularly appropriate and justified. The quality of visual interpenetration as a form of very intimate and personal communication through one's gaze became very apparent.

Although only the people present seemed to count, or to exist — i.e., seemed to constitute one's experiential world — there were moments in which one wished to have others join, particularly those dearest to one (but not present), to have them share in this unique and most wonderful of experiences, which transcends everything imaginable. The general feeling with regard to the others was one of unqualified benevolence. The common experience exerted a strong unifying force. There was absolutely no hostility or malice.

This is definitely an "end-in-itself" experience and phenomenon. The only ambition during the state seems to be to maintain it, and this by small correctives in the global situation such as finding the right place to sit, to lie down or to stand, or to adjust the temperature. As to the rest, one is completely suspended and truly living in one's experiences much more so than ever before. Activity is activity, situation is situation, and they should remain what they are, as everything — one feels — should remain what and as it is, no change is contemplated or desired, the purest suspension in "presentness" imaginable. Any form of utilitarian thinking is pushed out. It is a peculiar style or immersion into "passivity." Of course one moves, things are changed, there is much fluidity, etc., but this is perceived as happening to one, as a disturbance, as disequilibrium only to return to the state of tranquillity and suspendedness.

I had a profound experience of otherness" and "differentness." The ordering principles, particularly the directing forces of our mind, are relinquished.

Four Psilocybin Experiences

The self-reference recedes into the background, and the judgmental ability or the motivation for forming opinions and judgments vanishes.

One's gaze is synonymous with the direction of one's living. One is fully tuned in. One lives in one's senses, mostly visual, the most peculiar experience of "I-am-my-glance; I-am-in-my-eating." I fully participate in the activity without reservations, I am wandering, gliding, soaring through a phantasy world in exploration. I have escaped from the boundary and localization or fixation of my physical body and completely lack that usual and typical self-reflection and self-anchoring of my normal existence by which I channel and categorize experience in the appropriate barrels or regions of experience-collection.

The symbol of the way or voyage is most appropriate: being on one's way, in a novel and mysterious world which is totally unfamiliar and in which the familiar is transformed into something bizarre. One moves in wonderment and awe, is drawn here and there, beckoned and invited by the phantastic phenomena that reveal themselves. It seems futile to start comparing that which happens, with previous experience or familiar structures; one can only try to keep oneself open to the drama of presentation, and to respond to the vibrant and dazzling invitation to a graceful, sensory and experiential dance. A phenomenon is encountered, I accept it, questioningly; a new phenomenon intrudes, and again I acknowledge its self-disclosure. I am on the way, this is how it has to be, and it would be presumptuous, I would be to that extent deprived, if I tried to manipulate what was revealing itself, and to make it over in my own image.

I believe that it is a mistake to believe that I can use the experience to gain insight into myself in an analytical sense, to use it as a sort of magnifying glass, microscope, or focused beam to penetrate into the mysteries of my self-structure or self-organization. I would rather tend to use it to gain insight into the potentials of consciousness and different states of consciousness of which I am capable. I would like to experiment with differing experiential worlds, that of the modern age, the Baroque, the Gothic, etc. I would like to transform the environment in a way that would be conducive and visionary in this kind of a world, while recording my impressions either by talking out loud or by writing simultaneously.

I would say that I can gain insight into the nature of consciousness or experience, the meaning and essence of being and the experience of harmony, the mystery of life, communion and sharing, the delight of ecstasy, the temporary suspension of rules, the primacy of being over any form of having. Being-in-relationship — yes; in relationship with the objective world of things and experiential states, the prearranged balance and harmony of everything. I encounter appropriateness in myriad manifestations, I participate in a kind of harmonious and convincing equilibrium, in the way everything truly is, and how everything should be. I almost acknowledge a *Divine* order because I know that it exists: I participate in it, I create it and am created by it, I live it and am lived by it, it reveals itself to my being.

IV

This was my second experience with this wonderful drug. I'm with the same group as the first session. At only one time during this session was my own experience anything like the first, and for a very short time. The drug was not as powerful to me as it was before. The session was very quiet and peaceful. Everyone wrapped up not in their own world as last time, but in deep thought. We all took the drug at about 10 minutes to 11 and then we all went and lay on our respective beds. G. brought in his tape recorder and a couple of tapes he had made of a number of records, a few I'd heard before, but the others seemed new to me. I only recognized one record really, an East Indian record, that was played at my last session.

About 20 minutes after taking the drug we all grew very serious, deep in thought. I felt a twitch in my left eye and on occasion I still have it when I get excited or nervous. The next effect that came about was a pleasant warmth in the room. The room did not change, except to become more gayly colored and friendly. I guess the next thing that happened, happened while I was looking at a photography magazine. I was a little toward the edge of the bed and I began getting dizzy and felt that I would fall off the bed as I settled myself comfortably in the middle of it. Then I felt as though the pillow I had my head on would fall to the floor. I began moving it and it fell to the floor. I remarked to G. when I got up to get it, that I knew it was going to happen.

I smoked while the drug took its hold of me, but not at all for about two hours. I looked through a book of Picasso's paintings that G. had brought in and also the photography book, before the drug really took hold of me.

My bed was in the same spot as the last bed I lay in when I had my last session — over between two windows, then near the record player; at this session near the tape recorder. And the sun came in the window directly behind me.

Next, I began getting extremely nervous. I paid no attention to any of the others, nor they me. I just lay back with a come-what-may attitude. The others did the same. It was so peaceful and content just lying there on that bed. If I moved, I got nervous and shaky. But I felt I would stay in the bed forever, that I would never leave it, nor did I want to.

I tried to think of the people I knew outside and some of the things I'd done with them, but I just couldn't do it. I tried very hard to recall the fun and good times I'd had with these people, but as I said, I couldn't.

So I tried thinking of the people I'd met while I'd been in here and in other jails. I couldn't do that either.

Then all at once I could think of the people I knew both in and out of jail, but not of the good times and the fun I'd shared with them, just all the

Four Psilocybin Experiences

bad things I'd done with them, to them, and the way I treated them. I shut this out and started thinking of what I wanted out of life and how I was going to go about getting these things, not the material things, for under the drug material things did not matter to me at all. But again nothing came. I could not control the pattern of thought, all that I experienced was a period of complete nothingness, a void, empty, devoid of thought. This blank period seemed to last for some time, the only thing I could do was let the drug stimulate my thoughts. As soon as I stopped trying to think of what I wanted, the drug took over on the same pattern of thought as I had experienced in my first session.

The last Indian record came on and I closed my eyes: nothing, no color, nothing at all. I opened my eyes and felt very dizzy, so I closed my eyes again and all of a sudden a vision came unto me, waves of sound, strings waving with sound, the music, its very strings danced before me. The strings were gold, bright and brilliant. A voice came from the strings, mystical and Godlike in its tone, precise in its pronunciation, far away and abstract in its meaning to me. Then I saw the little green man again, emerald green, robe about him, long legs and arms wrapped about himself, bald head shining with light, long thin ears, bright green eyes, sly wide, grinning mouth. He had gold earrings in his ear, long, thin eyebrows and a little beard growing from his chin. He spoke of the music, of the very strings he sat upon.

Then I was scared. I thought someone had pulled a trick on me, and the little man disappeared. I thought to myself someone has dubbed the record with their voice, someone who I don't know, someone very clever in his trickery. Someone wanted to hypnotize me, make me the living, speaking dead. I told myself that there was time and that I would let myself be hypnotized. Then I realized I'd heard this record, these strings, this voice, at my last session and that I had seen this little green man also. And that I thought someone had dubbed the record, that it was a trick to hypnotize me and that I wanted to be hypnotized then too. Then it all went away. And in its place came once again the vast, empty desert. And the mountain range with its one high mountain reaching into the cosmic sky. I saw myself running as I did before. I came to the mountain and climbed it in a running gait. I reached the top. There was the same rock, the softness of it still there. On this rock was a man, a man both young and old. He had about his slim body, a liquid robe of the bluest blue. He had his hands folded in his lap. They seemed to glow, his fingers were long and bony and his hands slim and fine. He was looking into the sky and did not hear me. He had long, womanlike hair, smooth and shiny and black, coal black. I could only see part of his face, a small pointed beard covered his cheeks and chin, his eyes glowed with a yellow light and his nose was long and thin. He seemed to be speaking but I could not hear him. Maybe he was praying. I spoke to him, "Hey man, what are you doing here? I know you. I saw you before on a mountain." No answer. I could not help talking jive talk, abstract words. Then the vision disappeared and did not return.

THE PSYCHEDELIC REVIEW

The next thing that came to me surprised me greatly. It's the same thing I wanted to think of before. I saw my friends, everyone I ever knew, had anything to do with, I knew their names. But all I saw, all I heard, scared me. It's all the bad things I'd ever done to this certain person, that certain person, people I thought I loved, I'd hurt them and they in turn hurt me. I saw the girls I'd gone with, the guys I hung with, my family, my relations, different people I knew. But all that would come was the bad, stealing, lying, beating, hurting, swearing, cheating, insulting, things I could no longer think of without feeling guilty. I saw guys in here, in other jails, heard about what they were doing, what they'd done. It was all so scary, so horrible. Sickening in its impact. I saw what a life of crime was, hated it, fought it, licked it. Hopeless people caught up in it, the small-times doing the pettiest, vilest things. Things that make me shake to just think of them. The poor small-time criminal, unfortunate, gutless being, fighting the world they live in. They fought the people they loved, hated people that did not a wrong. Spit on them and the only people that really matter.

I hated crime, I now thought in this vision, and it meant something, but what? Then this too disappeared. I got up at this period and went to the bathroom. I wasn't drunk this time, nor was I dizzy. Nor did I want to stay in this bathroom as I did before. I weighed nothing in my mind as I did before. I just did it with little forethought. I smoked cigarettes now, one after another. They tasted rotten. By the taste, I felt I did not want to smoke, but I smoked four or five butts. I looked at the food on the table, I wasn't hungry. I looked at the milk there, drank one glass, wanted more so I drank someone else's glass too. It tasted wonderful, sweet and warm. I went over to the window and saw a few guys in the yard playing basketball. It looked like fun. Some of the other guys were on the football field practicing for Sunday's game. They looked very good out there, even better I thought with no other team on the field. I heard the yard radio, advertising some new car. I giggled, it seemed very funny that someone should be telling the con what car they should buy. What a waste of work.

I went back over to the bed and lay down and started thinking about the crime bit once again. I found, now, that I could control my thoughts, the music was washed out, I paid no attention to it. I saw that crime was foolish, a coward way out, a ridiculous flaunt in a child's game. Anyone could steal, anyone could kill, anyone could hurt the ones that loved them. But not anyone could be a cold, calculating, professional criminal. To be this, one would have to cut one's love from his life, his heart from his body his mind would be as a robot. Anyone could be a drunk. It took nerve to steal, but it took more nerve to be honest to fight for the right things in life, to live and let live.

A criminal, at least myself and all I've ever met, were either unloved children or lost individuals. Lost between right and wrong. What they wanted and the means to it. They knew their ends, power, wealth, money could not buy friends, loved ones, happiness, beauty, intelligence. I saw how foolish

Four Psilocybin Experiences

the game I played was, just saw through it, saw the ends I would find, instead of the ends I'd imagined. Disaster! Everything seemed so hopeless, so foolish, so futile, not a bit of fun, no love involved. It sickened me, what was life, a life of this kind, just misery for myself and those who loved me.

I again asked what I wanted from life and at once I got an answer — love, peace, plenty, intelligence, not power but friends.

I felt all wise now, all knowing. I got up from my bed and paced the room for a few minutes and smoked a few more cigarettes. I went over and sat on the table. G. came over and we talked, I don't recall of what. Then I went over and started looking through the book of paintings again. They were all beautiful, all so simple. G. came over and we both found two pictures we talked lengthily on, I liked them, he liked them. Then I saw a bag of chips on the table, opened them and began eating them. They were very good. I asked G. if he wanted some. He said no.

I looked at L., then closed my eyes and saw him again with a face following him, a woman's face. I got scared at this and felt I was going crazy. I told myself, "I'm not going crazy, it's the drug, it's the drug," but still I saw this. It's then that I opened my eyes and went to the bathroom. There couldn't have really been a blank spot in my thought after all.

I started looking through the photography magazine and saw pictures I didn't see the first time I looked at it. I fell for one of the pictures of a young woman, and I felt I must some day meet this woman and make love to her. G. came over once again and I showed him the picture, he said it wasn't his type. I asked him what was his type. He went through the magazine trying to find his type. He found one, a face, a look of living enticement. I now knew his type, I asked him what his interests were and he said photography, a little art. I knew most of his other interests. We talked about art, about photography. He said his wife did some painting and drawing, that he took some photos and slides. I asked him what his wife looked like and he vaguely described her to me. I asked him if his baby had blue eyes, he said yes. We started talking again and he went away. And he listened to the music. I went around the room a few times feeling very energetic, very wise, very powerful, very handsome.

The God in the Flowerpot ❖

MARY BARNARD

HERE IS A CACTUS PLANT in a flowerpot; it is small, spineless, grayish, apparently inedible and hardly a thing of beauty by any aesthetic standard. The botanist would recognize it as *Lophophora williamsii*. The scientist engaged in pharmaceutical research might identify it as a source of the drug called mescaline. Wyoming Indians refer to it among themselves as "the medicine," using that word in its double meaning as a cure for illness and a source of supernatural power. The Tarahumara Indians of Mexico call it *hikuli*, and the Aztecs called it *peyotl*. To the white men who are familiar with it, the peyote cactus is a plant containing an interesting assortment of alkaloids in varying proportions. To the Indians who use it in religious ceremonies it is often more than a "medicine," it is a god. The plant, which has a limited range in extremely arid, almost uninhabited country along the Mexican border, is the object of annual pilgrimages by the Tarahumara, who must make a journey of several days on foot to collect it. Oklahoma and Wyoming Indians import the dried "button" or raise peyote in pots. Whenever possible it is eaten fresh, without preparation; the dried button may be powdered, pounded into paste or made into tea. The god, being rendered fit for eating, presides over the meeting where peyote is taken and "sends" the songs sung and the visions seen by the members who partake of this sacrament. The peyote cult is not based on a written or spoken Word, but on the experience of the members during the communion.

My hypothetical flowerpot might have contained any one of a dozen plants, for instance, the Texas mountain laurel whose seeds are known as "mescal beans," several varieties of *Datura* including the jimsonweed of the American Southwest, certain lianas of the South American forests, a kava (awa) plant from Polynesia, the soma of ancient India, the haoma of the Parsis, the coca of Peru, or Indian hemp — the source of marijuana and hashish. The opium

* Reprinted with permission from *The American Scholar*, Vol. 32, No. 4, Autumn, 1963, pp. 578-86. This article is part of a forthcoming book by Miss Barnard.

poppy would probably not be out of place. Several species of hallucinogenic mushrooms belong in the list, or would belong if they could be induced to grow in pots. I have used the American peyote because it is perhaps the most thoroughly documented of all these plants, none of which is valued for its vitamins or caloric content. All are drug plants: they inebriate, soothe pain or function as mind-changers. Some of them are open doors to the otherworld, and as such they have religious uses. They are sacred plants, magic herbs or shrubs, magic carpets on which the spirit of the shaman can travel through time and space. Like shamanism, which has been described as a religious technique rather than a religion in itself, the magic plants are vehicles for a special kind of experience adaptable to the use of most religions that acknowledge an otherworld and permit its exploration.

IF THERE WERE SUCH A FIELD AS THEO-BOTANY, the study of these plants and their cults would be work for a theo-botanist. As it is, little has been published in the way of comparative studies, perhaps for the very good reason that the scholar who attempts such a study must step out of his own field into four or five others, and thereby risk his reputation. Laymen, therefore, who have no prestige to lose, burst in where scholars fear to tread, and here am I. My own interest is in the mythology of the drug plants, and my approach has been by way of mythology, a study as perilous to the scholar as theo-botany. The hazards have therefore seemed less and the facts, such as we have, reassuringly firm. My approach to the subject was inadvertent, almost accidental; my experience that of one who has been treading water interminably and feels solid ground beneath his feet at last. Half a dozen important mythological themes — the shaman's journey, the food of immortal life, the food of occult knowledge, the fate of the disembodied soul, the communication with the dead, plant-deities — all converge on this point: that is, on some actual food (usually a drug plant) ritually consumed, *not* symbolically but for the experience it confers. Most of these drug plants are what Aldous Huxley calls "mind-changers." The experience differs according to the drug or mixture of drugs and alcohol taken by the shaman, the initiate or the communicant whoever he may be. He may fall into a coma lasting for a day or more; he may be awake, but anesthetized; his mind and body may be stimulated to wakefulness and fatigue dispelled so that he can perform feats of endurance quite impossible without the assistance of the drug. He may experi-

THE PSYCHEDELIC REVIEW

ence color visions of varying intensity. Euphoria, quickened or dulled sensation, a displaced center of consciousness seemingly *outside* the body, a sense of enormously protracted time and extended space, and a feeling of weightlessness, of escape from the forces of gravity, are among the possible effects. Usually the communicant fasts for a day or longer before taking the peyote, soma, mushroom or extract of jimsonweed. One good reason for the fast is of course the quicker and more powerful action of the drug on an empty stomach.

Bearing these facts in mind, let us return to the peyote and its mythology. So far as I know there is only one peyote myth, although there are many variations on the single theme. Since the peyote tradition has moved outward from the very limited peyote-growing region, the myth has presumably been passed along with the dried plants and the ritual. The peyote myth tells how an Indian (or several Indians — number, age, sex and condition varying according to the particular version) is lost or wounded and left for dead in an uninhabited desert region. Starving, thirsty, at the end of his strength, he stumbles upon the peyote. A voice tells him to eat it. He eats it and feels his strength miraculously restored. His hunger and thirst are alleviated, and he is able to make his way back to his people, to whom he bears the word of a new god sent to heal their suffering. Usually the Indian hears a voice directing him to eat the plant, or sees a godlike form in the shape of an Indian brave standing where the plant stood; in some versions he is given instructions by Peyote himself on the proper performance of the peyote ritual. Peyote has been used to prolong the endurance of dancers, to alleviate pain, to produce visions, to give courage in warfare and generally as a means of healing and communion in the peyote cults.

There are several points of almost equal importance in this brief summary. One is that the first man to eat peyote was very likely on the verge of starvation in that arid region where the plant grows. It is so unpalatable in appearance, so difficult to chew and swallow, that only a ravenously hungry man would be likely to make the effort. The lack of food plants in the peyote-growing area makes this hypothesis still more plausible. Furthermore, if a hungry man were to eat the fresh peyote he would almost certainly have a startling experience similar to the one described in the myth. His strength would be restored in an apparently miraculous manner and

The God in the Flowerpot

he would probably have hallucinations of some sort — visual or auditory or both. The peyote ritual, which presumably took shape gradually, was later attributed to the personified peyote, a god who was said to have revealed himself in a vision.

IF THE READER SUPPOSES that I am using the myth to shed light on the origins of the peyote cult, he is mistaken; I am using the *Lophophora williamsii* and all we know about it to shed light on the myth. It should be obvious at once that if we lift the myth from its cultural context, and substitute the word "cactus" or even "plant of life" for the word "peyote," the tale might quickly find its way into collections of myths and folklore concerned with *imaginary* fruits, leaves, roots or stalks that are sought over the earth, guarded by dragons, used to inspire poets, to lend strength to the arm of the warrior or renew the youth of the immortal gods. Should we conclude, then, that the myth of peyote's discovery is one variant on an almost universal theme attributable to the almost universal sameness of the unconscious mind? Or is it possible that the plants in the other myths are not necessarily imaginary? Are they, perhaps, real plants in imaginary gardens? Perhaps their mythical uses are derived from their cult use, and extended by hyperbole until the plant itself becomes mythical in the songs and retold tales.

The soma-drink of the Hindus was made from a real plant upon which the soma cult rested just as the Plains Indian or Tarahumara peyote cult rests upon the peyote plant. The soma plant, pounded, soaked, and wrung out of a strainer, provided a drink that was inebriating even without fermentation. The soma was deified as the god Soma, who inspired seers and poets and fortified the warrior. The kava-drink of Polynesia was prepared in much the same way from the kava plant (*Piper mythisticum*, "intoxicating pepper") and was used as a ritual drink, as a libation poured to the gods, and as a trance-inducing beverage for the soothsayers. Both these plants have heavenly counterparts that provide a tippie for the gods. In other words, they have a mythology, and a much more extensive mythology than that of the peyote plant. The jimsonweed, prepared by maceration and mixed with water in a ceremonial bowl, was formerly used by some California Indians during initiations, when the novice was expected to see visions and gain shamanistic power. It, too, has its mythology. The sacred mushrooms of Oaxaca are taken raw, on an empty stomach, like the fresh peyote. When the shaman

has swallowed the mushroom, the mushroom-deity takes possession of the shaman's body and speaks with the shaman's lips. The shaman does not say whether the sick child will live or die; the *mushroom* says. Some Indians say of sacred plants used by their shaman, that the soul of an ancestor has entered the plant; it is he who takes possession of the shaman and speaks through his mouth. The oracle at Delphi chewed laurel leaves for the same effect; in a state of inebriation induced by a small amount of cyanide in the laurel, she surrendered to the god (in this case Apollo), who used her as his instrument. His will was made known through her utterances delivered in trance and interpreted by the attendant priests. The laurel was, of course, sacred to Apollo.

Apollo, like the Norse god Woden and most shamans of whatever race or sect, was associated with healing as well as divination or prophecy. The same plant that brings visions or otherworld experiences may alleviate pain. Even if it does not, the herbalist who knows the medicinal uses of healing herbs has the best opportunity to possess the occult knowledge conferred by hallucinogenic shrubs and fungi. There are plants used to ease the pain of childbirth and myths of magic plants used for the same purpose. There is a Peruvian tale, very like the peyote myth cited above, telling how men first discovered the use of the cinchona bark from which quinine is made. If we begin our inquiry into the possible reality of the "magic" plants figuring in mythology with a compendium of real plants and their real uses in medicine, divination and religion, the list is immensely long and inevitably immensely tangled because medicine, divination and religion are tangled. Medicine enters this complex not because primitive medicine was limited to faith healing, but because the shrubs and herbs used in treatment were also used in religious ceremonies.

The most obvious thread for the ambitious theo-botanist to grasp would be the relation of drug plants and intoxicants to shamanism and its characteristic mythology of the disembodied soul. The greatest obstacle the student would encounter is a dearth of knowledge about the drugs used and their precise effects on the nervous system. We know enough about shaman mythology to make a beginning, and we have many eyewitness accounts of shaman performances; but all too often we are told simply that the shaman "takes something," without being told what he takes. This gap in

the narrative can be explained in part by the shaman's reluctance to give away his secrets, and in part by the fact that early informants were inclined to regard the shaman's act as Satanism if they were Christians or sheer hocus-pocus if they were skeptics. The current anthropological tendency, so far as I can make out, is to study the shaman as a psychological or cultural phenomenon. Mircea Eliade in his book *Le Chamanisme* mentions the use of drug plants by many shamans, but seems to consider the drugs incidental to the tradition. The pattern, he implies, is already formed; the drug, when discovered, is adapted to the shaman's use. This assumption parallels that of the mythologists who put the desire for an afterlife and the belief in an imaginary nectar of immortality before the experience of actual plants and beverages used in the ceremonial communion with the gods or the ancestors. The food of occult knowledge, by the same token, is treated as fiction; and when the shaman drinks a mysterious beverage, it is assumed that he does so in pretence that it is the mythical draught. But isn't this putting Medea's chariot before her team of serpents?

WHEN WE CONSIDER THE ORIGIN OF THE MYTHOLOGIES and cults related to drug plants, we should surely ask ourselves which, after all, was more likely to happen first: the spontaneously generated idea of an afterlife in which the disembodied soul, liberated from the restrictions of time and space, experiences eternal bliss, or the accidental discovery of hallucinogenic plants that give a sense of euphoria, dislocate the center of consciousness, and distort time and space, making them balloon outward in greatly expanded vistas? A belief in the soul's reincarnation would seem to me more plausible than the widespread idea of a soul's continued independent, disembodied existence after it leaves the body, a concept usually explained by night-dreaming or an irrational fear of the dead. Perhaps the old theories are right, but we have to remember that the drug plants were there, waiting to give men a new idea based on a new experience. The experience might have had, I should think, an almost explosive effect on the largely dormant minds of men, causing them to think of things they had never thought of before. This, if you like, is direct revelation.

Trance, self-induced by whatever means, is an inseparable part of shamanism. During the trance the shaman's body is said to be emptied of his soul. There are two traditional interpretations of this phenomenon: one is the replacement of the shaman's soul by

THE PSYCHEDELIC REVIEW

another spirit, that of a god, ancestor or deceased shaman. (The deceased shaman may of course be both god and ancestor, and any of the three may take animal form.) In the other interpretation, the one I am concerned with here, the liberated soul of the shaman goes on a journey, perhaps in search of a lost soul, perhaps as escort for the soul of one who has just died, conducting it to the land of the dead. The dislocated or liberated soul may fly across the pampa on a spirit-horse or ascend into the sky, to the moon or the North Star. R. G. Wasson, describing the effect of the divine mushroom taken in a séance at Huautla, says: "There is no better way to describe the sensation than to say that it was as though my very soul had been scooped out of my body and translated to a point floating in space, leaving behind the husk of clay, my body." This is the shaman's journey.

The effect of peyote or hallucinogenic mushrooms taken ceremonially to the accompaniment of drums, songs or the hypnotic chant of the shaman demanding the descent of the spirit is naturally somewhat different from that produced in a laboratory or office while a doctor sits beside his subject with a notebook. Nevertheless, Aldous Huxley's testimony on the effect of mescaline, especially insofar as time is concerned, is eloquent: "I could, of course, have looked at my watch," he says, "but my watch, I knew, was in another universe. My actual experience had been, was still, of an indefinite duration or alternatively of a perpetual present made up of one continually changing apocalypse." The mushrooms of Huautla do not contain mescaline, but the effect, according to Mr. Wasson, is similar: "The mushrooms sharpen, if anything, the sense of memory, while they utterly destroy the sense of time. On the night that we have described we lived through eons. When it seemed to us that a sequence of visions had lasted for years, our watches would tell us that only seconds had passed." The Indians say of the mushrooms: "*Le llevan ahí donde Dios está*" — "They carry you there where God is."

When the soma is poured on straw, the souls of the ancestors gather in their thousands to drink it, because this is their food. When the kava is poured in libation or drunk by the priests, the souls of the dead are invoked, and the entry of the shaman into trance announces their arrival. Ceremonially speaking, these are foods of disembodied spirits, but the Chinese have, in the Taoist

The God in the Flowerpot

tradition, another variant of the food of immortality. Here the emphasis is not on shamanism or the consultation of oracles, but on mysticism combined with alchemy. The Taoists, in their search for an actual "food of immortality," experimented with drug plants and venoms. They knew the uses of laurel, Indian hemp and muscarine extracted from the glands of the poisonous toad. They knew the *ling-chih*, the "divine fungus" eaten by Taoist hermits and depicted by Taoist painters. In one of his poems, Li Po announces that he has swallowed the pellet of immortality "and before the lute's third playing" — that is, the third stanza of a song — "have achieved my element." Does anyone suppose that Li Po really believed that a pellet would make him immortal? Was his pellet simply imaginary? Or was he speaking of the euphoria conferred by one of the drug plants known to the Taoist priests? To me it seems clear that his pellet was as real as a pellet of peyote paste; it was to him a "food of life" in the same sense that our *aqua vitae* is a "water of life." I also suspect that at least half the other foods of life (apples, ambrosia, leaves, bark, roots and elixirs) had their beginnings in real plants. The "talking" grasses and trees that the shaman uses to bring on his trance are certainly real, and insofar as they are used by him for this purpose, they are foods of knowledge — that is, of occult knowledge. Looking at the matter coldly, un-intoxicated and unentranced, I am willing to prophesy that fifty theobotanists working for fifty years would make the current theories concerning the origins of much mythology and theology as out-of-date as pre-Copernican astronomy. I am the more willing to prophesy, since I am, alas, so unlikely to be proved wrong.

* * * *

BOOK REVIEWS

SOME RECENT BOOKS ON PSYCHOPHARMACOLOGY

Cholden, L. (ed.), *Lysergic Acid Diethylamide and Mescaline in Experimental Psychiatry*. N. Y. and London: Grune & Stratton, 1956. Pp. 85. \$3.25

Abramson, H. A. (ed.), *The Use of LSD in Psychotherapy*. N. Y.: Josiah Macy Foundation, 1960. Pp. 304. \$5.00

Bradley, P. B., Deniker, P., Radouco-Thomas (eds.), *Neuro-Psychopharmacology*, Vol. I. [Proc. of the 1st Meeting of the Collegium Internationale Neuro-Psychopharmacologicum, Rome, 1958.] Amsterdam and N. Y.: Elsevier, 1959. Pp. 728. \$27.00

Rothlin, R. (ed.), *Neuro-Psychopharmacology*, Vol. 2. [. . . 2nd Meeting . . . Basel, 1960.] *Ibid.*, 1961. Pp. 521. \$24.00

Garattini, S., and Ghetti, V., *Psychotropic Drugs*. [Proc. International Symposium on Psychotropic Drugs, Milan, May, 1957.] *Ibid.*, 1957. Pp. 606. \$19.50

Kety, S. (ed.), "Pharmacology of Psychotomimetic and Psychotherapeutic Drugs." *Ann. N. Y. Acad. Sci.*, Vol. 66, 1957. Pp. 433. \$5.00

Siva Sankar, D. V. (ed.), "Some Biological Aspects of Schizophrenic Behavior." *Ann. N. Y. Acad. Sci.*, Vol. 96, 1962. Pp. 490. \$4.50

Featherstone, R. M., and Simon, A. (eds.), *A Pharmacological Approach to the Study of the Mind*. Springfield, Ill.: C. C. Thomas, 1959. Pp. 399. \$10.75

Sarwer-Foner, G. J., (ed.), *The Dynamics of Psychiatric Drug Therapy*. Springfield, Ill.: C. C. Thomas, 1960. Pp. 624. \$16.00

West, L. J. (ed.), *Hallucinations*. N. Y. and London: Grune & Stratton, 1962. Pp. 295. \$9.75

Pfeiffer, C. C., and Smythies, J. R. (eds.), *International Review of Neurobiology*. Vol. 4. N. Y. and London: Academic Press, 1962. Pp. 382. \$12.00

Rinkel, M. (ed.), *Specific and Non-specific Factors in Psychopharmacology*. N. Y.: Philosophical Library, 1963. Pp. 174. \$3.75

Wikler, A. *The Relation of Psychiatry to Pharmacology*. Baltimore: Williams & Wilkins, 1957. Pp. 322. \$4.00 (paper).

Woolley, D. W. *Biochemical Bases of Psychoses*. New York: John Wiley, 1962. Pp. 331. \$11.95

The above list is by no means exhaustive but is representative of the major books and monographs on psychopharmacology and related topics to date. (Books specifically on narcotics have not been included, nor have books on pharmacology in general.) All these are concerned with mind-changing drugs (tranquilizers, stimulants and psychedelics mainly), and indicate the enormous amount of medical and scientific discussion that has taken place concerning these substances.

All except the last two are conference proceedings and transcripts of symposia. No attempt will be made here to review them extensively. It will suffice to indicate roughly the

Book Reviews

content of the volumes and to point out papers of special interest to readers of *The Psychedelic Review*. Several of the older volumes are of course out of date in terms of the experimental data included.

The volume edited by Cholden is partly outdated but is valuable for its concise, non-technical presentation of the major facts and problems.

The Josiah Macy, Jr., Foundation sponsored in 1959 a now famous conference on the use of LSD in psychotherapy. This volume, edited by one of its participants, Harold Abramson, is the transcript of this conference. Five papers and panel discussions are presented covering a range of related topics including psychoanalytic psychotherapy with LSD, the nature of psychological responses to LSD, psychotherapy by symbolic presentation, the study of communication processes under LSD, and a clinical case history. This volume is an important contribution to this area, presenting on both anecdotal and empirical levels the evidence for treatment success within traditionally oriented psychotherapy. Of greater interest are the described attempts to develop new forms of therapy based on the archetypal and symbolic aspects of the LSD experience.

The volumes edited by Bradley, et al., Rothlin, and Garattini and Ghetti are international conference proceedings of a highly technical and specialized nature. The second *Neuropsychopharmacology* volume, for example, has symposia and papers on the following five topics: the problem of antagonists to psychotropic drugs, the effects of psychotropic

drugs on conditioned responses in animals and man, the influence of specific and non-specific factors on the clinical effects of psychotropic drugs, measurement of changes in human behavior under the effects of psychotropic drugs, and biochemical mechanisms related to the site of action of psychotropic drugs.

The *Annals of the New York Academy of Sciences* have published two volumes in this area. The first, edited by Kety, contains the classic paper by Humphry Osmond, "A Review of the Clinical Effects of Psychotomimetic Agents," as well as reviews of the literature up to 1956 and several reports of original experiments. Eleven out of the thirty-three papers are devoted to serotonin and its possible role in the nervous system. The second volume, edited by Siva Sankar, has three sections: (1) studies of experimental psychoses and neurohormones, which contains papers on mescaline, LSD, sleep deprivation, serotonin, etc.; (2) studies on psychopharmacological drug action, which chiefly contains papers on the metabolism of various mind-altering drugs; and (3) studies on schizophrenia and behavior, which reports the latest research on the problem of a physiological or biochemical basis of schizophrenia.

The Dynamics of Psychiatric Drug Therapy, edited by Sarwer-Foner, and *A Pharmacologic Approach to the Study of the Mind*, edited by Featherstone and Simon, are conference proceedings in which a range of pharmacological research is presented. The Featherstone and Simon volume has a broadly conceived scope and emphasizes a complete section on the

THE PSYCHEDELIC REVIEW

hallucinogens. A brief article by A. Halliday on psychological studies of these drugs, and an article by Sidney Cohen on the therapeutic potential of LSD, are of particular interest. This volume includes a paper by Aldous Huxley on the social, ethical and religious implications of new biochemical-psychological techniques.

The Sarwer-Foner volume represents a number of research topics including: (1) The physiological effects of the neuroleptic drugs and their psychological implications, (2) The effects of neuroleptic drugs on ego defenses and ego-structure, (3) The influence of the milieu and sociological determinants of behavior, (4) Transference and countertransference problems in relationship to drugs, and (5) Therapeutic aspects of the neuroleptic drugs. Papers by A. DiMascio and G. Klerman on the role of non-drug factors in human psychopharmacology and R. Hyde on psychological and social determinants of drug action are especially interesting in their recognition of the importance of subject-experimenter interaction and the effects of other environmental factors in responses to drugs. Some general problems in drug therapy and the use of drugs in psychoanalysis are discussed and illustrated with case material by M. Ostow and others.

The volume on *Hallucinations* contains 26 papers on hallucinations induced by drugs (3), sensory deprivation (2), sleep deprivation (2), hypnosis (1), occurring spontaneously in psychosis (4), and on general topics (hallucinations in children, neurophysiology of hallucinations, phenom-

enology of hallucinations, social aspects, phantom sensations, body image boundaries, psychophysics and reality, etc.). This volume is especially interesting in its clear recognition of the essential similarity between the states of consciousness induced or produced by many different means or conditions.

The fourth volume of the *International Review of Neurobiology* contains two papers of outstanding interest. One, by L. G. Abood and J. H. Biel on "Anticholinergic Psychotomimetic Agents," is the first exhaustive review of the chemistry and pharmacology of this new series of extremely potent consciousness-altering drugs (Ditran and related compounds).

The other is a review by A. Hoffer of "The Effect of Adrenochrome and Adrenolutin on the Behavior of Animals and the Psychology of Man." The theory, first proposed by Hoffer and Osmond, that adrenochrome and adrenolutin are "psychotomimetic" has been controversial. It is now generally accepted that they produce changes in animals, and less widely accepted that changes in the perception, thinking and feeling of humans also occur. Hoffer concludes from his review of the work that "the kind of visual hallucinations seen with mescaline, LSD, psilocybine, and other substances is not produced." It is still an open question whether adrenochrome or some other active epinephrine derivative occurs in the human organism.

The volume edited by Rinkel contains some papers on the role of personality variables and experimenter

Book Reviews

attitudes in drug-response; and an excellent review (by H. E. Himwich) of the correlation between abnormal psychic states and fluctuations in levels of brain chemicals.

Abraham Wikler's monograph, although it does not include the most recent work, is still by far the most subtle and methodologically sophisticated book in this area. With 270 pages of very concise, closely-reasoned and lucid exposition and almost 900 references, Wikler describes and discusses all of the major mind-altering drugs. The first section reviews the uses to which the drugs have been put: the production of coma (insulin, CO₂, barbiturates); "psychoexploration" (CO₂, barbiturates, ether, methamphetamine, LSD), tranquilization (chlorpromazine, reserpine, azacyclonol, meprobamate); arousal and elevation of mood (amphetamines, piperidrol); diagnosis (barbiturates, epinephrine and methacholine); production of "model" psychoses (LSD, mescaline). Then come three sections on theories and mechanisms of drug action at the biochemical, physiological and psychological levels, in which each of these drugs is discussed separately. Wikler's philosophy of science is operational, and he is at all times explicit and insistent about the separation of observations and inferences. Although difficult to read, this book is most highly recommended for anyone seriously interested in the scientific explanation of the effects of mind-changing drugs.

Woolley's book is a statement of the theory which he was one of the first to propose — that defects in the metabolism of serotonin are the cause of

schizophrenia. The "psychotomimetic" action of LSD and its antagonism to serotonin are crucial links in the argument. Much experimental evidence is presented and other biochemically-produced abnormal psychic states are also discussed. The book is well written and invaluable for anyone interested in this highly controversial and constantly expanding field.



Meat Science Essays

Michael McClure
San Francisco: City Lights Books
1963. Pp. 82. \$1.50.

This book contains a handful of colorful outpourings on themes of suicide, death, revolt, drugs and sexuality, freedom, Artaud, Camus, Büchner. McClure's writing is effusive, opinionated, shimmering, singing with happy affirmation: "A new era is at hand and it must be joyfully struggled for in full awareness and enjoyment of life. The change is not only inside of myself. In all men there is a new consciousness. A new combat for freedom and happiness and pleasure is beginning everywhere. . . ."

His brief statement on "Suicide and Death" is one of the best discussions of this subject since Hermann Hesse's "Treatise on the Steppenwolf." The essay on "Revolt" traces patterns in animals and men: the revolt of the body, of physiological process against the domination of the head, the learned structures that are useful for survival but constrict and cause pain and separation.

Two of the pieces in the volume are about drugs. One, "The Mush-

room," is an account of a session with psilocybin.

People are the main thing with the mushroom. . . . The strangest, most grotesque, and most glorious people on earth are selected and paraded in front of you. It's one of the most elevated comic dramas ever seen. All is both comic *funny* and 'Comedy' in the sense that Dante wrote *The Divine Comedy*. You laugh and weep staring at the faces and bodies and weird costumes and godliness and beastliness of mankind.

Ecstatic insights into the concrete physical manifestations of psychic moments and impulses abound.

All humanity passed us by covered with sores and bandages, and tee shirts, and furs, and psychoses, and raptures — not one of them looked like anything I had ever seen. Every shadow or detail of face, emotion, highlight of lip or hair, or swarthy arm-hair stood out in unique radiance.

The account ends with a poem in "Beast Language."

The "Drug Notes" are much better. Peyote, Heroin, Cocaine. Each one a masterful experiential vignette. Interior landscapes are drawn with loving precision. Three extracts from "Peyote" may serve as examples:

And to see colors leap into ten trillion unexpected glows and fires and radiances — to see the sharp edges of definition upon all material things, and all things radiating chill or warm light — is to know that you've lived denying and dimly sensing reality through a haze. All things beam inner light and color like a pearl or shell. All men are strange beast-animals with their mysterious histories upon their faces and they stare outward from the walls of their skin — their hair is fur — secretly far beneath all they are

animals and know it . . .

For some in the high there is a glimpse of a final strangeness and alienation — a complete true sane madness. It is a glimpse seen by many men many times. Physicians who believe mental illness is a disease and not a struggle of the soul and spirit in threat of dissolving are wrong. A man who has seen complete cold fiery-colored emptiness with all of the flashes of lights and radiances and solids in its splendor of shallow chill hollowness carries the sight forever. He cherishes what he can create beyond the emptiness, and he puts what he can into that emptiness to warm it. Finally, perhaps, a deep enough measure of wisdom may come over him so he can love what was always there before his discovery. Perhaps then he may love the things that preceded in existence the new works of his hand and brain. . . .

There is religiousness — no other word names the height of human feeling that includes the personal and quiet active ecstasy of being a cohesive and singular being within all. There is no barrier between you and what you sense. There is no thought of a spoon. It exists in its most primeval, barest and most vibrant spirit state. It is there to be used, seen, touched or not. There are no inversions of desires — but only the immediate: thirst and hunger and their satisfactions. Water in the mouth is an Ocean moving in the cave of the Universe. We live in a void and we carry the void with us — it is an emptiness that we fill with the traces of our gestures. We warm it and enlarge it or it darkens and closes upon us!

The descriptions of heroin and cocaine experiences are strikingly different. Physical sensations dominate the awareness. Not like the cosmic

play with reality-levels of the peyote experiences. With heroin, for example:

There is no combat with circumstances or events — no boredom or intensity. Sitting on a bed or a trip are the same. There is quiescence even while moving; there is an inviolable stillness of person. You are a warm living stone. In a fast open car you are a herculean vegetable — the wind on your face is a pleasant hand. You half-nod at the passing of scenery. Eating and drinking are the same but without interest. You feel yourself exist in a place or activity but without feeling of responsibility. There is nothing to drag you. You have *occurred*.

A new kind of self takes over — there is not so much *I*. *I* is an interference with near-passivity. This is a full large life — there is not much criticism, anything fills it. Rugs are as interesting as a street. Whatever is spoken is as meaningful as any other speech. . . .

Cocaine is an *ace of sunlight* that can be snuffed through the nostrils into the brain. For days it lightens the black interiors of the body and lends an ivory cast of sleekness and luminosity to the senses.

Comparative phenomenological descriptions of different states of consciousness are hard to find. The *Drug Notes* are valuable miniatures by a gifted word-painter.

* * *

City Lights Journal (number one)
Edited by L. Ferlinghetti
San Francisco: City Lights Books,
1963. Pp. 112, 4 illustrations, \$1.50.

City Lights Journal is a new literary annual containing poems, essays, stories by Williams, Ginsberg, Kerouac, Burroughs, McClure, and an extract from Henri Michaux's *Con-*

naissance par les Gouffres, one of two books on mescaline by the French writer who occupies somewhat the same position that Aldous Huxley occupies in English-speaking countries. (The other, *Miserable Miracle*, has just been published by City Lights, \$1.95.) The *City Lights Journal* provides probably the best cross-section of the products of the whole "beat" movement.

* * *

Birth. (Number 3)

Double Number in 2 books. New York: Birth Press, 1960. Pp. 160, 75 illustrations, \$2.00. Edited by T. Kupferberg (381 E. 10th St.).

This double number of *Birth* is devoted to stimulants of many varieties. The first part covers alcohol, marijuana and peyote; the second opium, tobacco, tea and coffee, and various stimulants. The two pamphlets constitute a kind of collage of social reaction to the various mind-changers. The aim is not "to settle the problem(s) of 'narcotics,' but merely air and expose several of their most interesting, delightful and deadly faces."

Newspaper clippings, medical articles, literary descriptions, poems, historical texts, drawings, advertisements; from Egyptian papyrus and medieval Latin tracts to *New York Times* reports and de Ropp — a bewildering and amusing variety of opinions. For each of the "stimulants," attitudes can be found ranging from enthusiastic espousal to hysterical condemnation. These small volumes are of great value in obtaining some rational and humorous perspective on this emotion-laden and taboo-ridden area.

THE PSYCHEDELIC REVIEW

OTHER BOOKS

Drugs and Behavior

Edited by L. Uhr and J. G. Miller
New York: Wiley, 1960. Pp. 676.
\$10.75

This book reviews some effects of psychoactive drugs (tranquilizers, energizers and psychotomimetics) on human behavior and experience. The 51 chapters are of two general types: those discussing general theoretical and methodological issues involved in drug research, and those reporting on specific research studies. The first section, the methodological, chemical, biological, and clinical context for psychopharmacology, is divided into (a) biochemistry, physiology and pharmacology, and (b) methodology. The second section, experimental procedures and results, includes: (a) experiments on animals of potential application to human subjects; (b) objective assessment of normal human behavior; (c) techniques for assess-

ing autonomic, motivational, and pathological states; (d) experimental use of observational techniques; and (e) controlled subjective measures.

The Drug Experience

Edited by David Ebin
New York: Orion, 1961. Pp. 385.
\$5.95

The subtitle of this book is "First-person accounts of addicts, writers, scientists and others." There are about 40 accounts of individuals who have used, been addicted to, or have experimented with a number of mind-altering drugs including hashish, heroin, bhang, opium, mescaline, peyote, psilocybin, LSD, mushrooms, marihuana, and morphine. A very readable volume with much diverse material including accounts by Aldous Huxley, Billie Holiday, Cocteau, Havelock Ellis, Allen Ginsberg, De Quincey, Aleister Crowley, William Burroughs.



STATEMENT OF PURPOSE

Recent years have witnessed a widespread increase of interest in the alteration of consciousness. The discovery of the psychedelic substances, such as LSD, psilocybin and mescaline, has been a major factor contributing to this interest. Scientists and scholars from diverse areas, as well as laymen, have recognized the importance of these substances as powerful tools for the exploration of consciousness. The effects of psychedelic substances pose fascinating problems for medical and psychological research and have far-reaching implications for many issues in the sciences and the humanities.

The Psychedelic Review is designed to serve as a forum for the exchange of information and ideas about these issues. It will publish original research reports, scholarly and historical essays, outstanding phenomenological accounts of spontaneous or induced transcendent experiences, and reviews of relevant pharmacological and other literature.



* * * *

CONTRIBUTORS

Joe K. Adams, Ph.D., is a practicing clinical psychologist in Palo Alto, Calif. . . . *Gary M. Fisher, Ph.D.*, is a practicing clinical psychologist in Los Angeles. . . . *Sir Julian Huxley*, world-famous biologist and former director-general of UNESCO, is author of several books on evolution. *Timothy Leary, Ph.D.*, is president of the International Federation for Internal Freedom. . . . *Richard Evans Schultes, Ph.D.*, is Curator of Economic Botany, Botanical Museum of Harvard University. . . . *Frederick Swain* has been associated for many years with Vedanta Ashram in La Crescenta, Calif. . . . *Mary Barnard* is a writer and Greek scholar residing in Vancouver, Washington.

* * * *

The Review welcomes advertising. It especially welcomes comments and reactions from its readers, who are invited to submit their opinions, ideas, and critiques for either private communication or publication.

— The Editors. —

The Psychedelic Review

Vol. I

1964

No. 3

Aldous Huxley Memorial Issue

Contents

EDITORIALS	262
A Tribute to Aldous Huxley	<i>Gerald Heard</i> 263
Aldous Huxley—A Tribute	<i>Huston Smith</i> 264
Some Remembrances of Aldous Huxley	<i>Alan Watts</i> 265
The Last Message of Aldous Huxley	<i>Timothy Leary</i> 267
NOTES ON THE PRESENT STATUS OF OLOLIUHQUI AND THE OTHER HALLUCINOGENS OF MEXICO	<i>R. Gordon Wasson</i> 275
THE ACTIVE PRINCIPLES OF THE SEEDS OF RIVEA CORYMBOSA AND IPOMOEA VIOLACEA	<i>Albert Hofmann</i> 302
A UTERINE STIMULANT EFFECT OF EXTRACTS OF MORNING GLORY SEEDS <i>Ara H. Der Marderosian, Anthony M. Guarino,</i> <i>John J. De Feo and Heber W. Youngken, Jr.</i>	317
THE RELIGIOUS EXPERIENCE: ITS PRODUCTION AND INTERPRETATION	<i>Timothy Leary</i> 324
POEM . . . from the <i>Maximus Poems</i>	<i>Charles Olson</i> 347
COMMUNICATIONS: AN OPEN LETTER TO MR. JOE K. ADAMS	<i>Lynn Sagan</i> 354
BOOK REVIEWS	357
BOOKS RECEIVED	370
CONTRIBUTORS	Cover
	261