

# PSYCHEDELIC REVIEW

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# The Psychedelic Review

Vol. I

1964

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## *Aldous Huxley Memorial Issue*

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## EDITORIALS

ALDOUS HUXLEY DIED of cancer on the same day that John Kennedy was assassinated. The violent death of the young statesman overshadowed the peaceful departure of the old philosopher. The public and the press have taken scant notice of his passing. Since Huxley devoted much attention and interest to the field of psychedelic research (he wrote three books and many articles on the subject), it is fitting that we should dedicate this issue of *The Psychedelic Review* to his memory. For this reason we have invited four men, who knew Huxley personally, to contribute their thoughts on the departure of this illumined soul.

\* \* \*

*The choice is always ours. Then, let me choose  
The longest art, the hard Promethean way  
Cherishingly to tend and feed and fan  
That inward fire, whose small precarious flame,  
Kindled or quenched, creates  
The noble or the ignoble men we are,  
The worlds we live in and the very fates,  
Our bright or muddy star.*

—Aldous Huxley (from *Orion*)



A TRIBUTE TO ALDOUS HUXLEY

*Gerald Heard*

AFTER THIRTY-TWO years an intimate friendship with a remarkable man, possessed of a remarkable mind, comes to an end. Looking back over the landscape of that long relationship with Aldous Huxley, one sees that though it is crowded with books, just as a "built-up area" is thick with houses, the books, outstanding in themselves, appear as symptoms of a mind even more remarkable than the surface mind visible to his public. To use a more literary simile, his books were the illuminated initials in the Great Breviary of his intelligence.

For he was the last of a rare and transitory species that appeared briefly in the ultimate phase of Renaissance Man:—the scholar of style, the essayist of genius, the ultra-learned novelist who "galvanizes" his characters with the high charge of his strange knowledge and the crackling static of his wit: the amazingly informed amateur whose selfless desire for all information, and impartial love of any understanding, kept him perpetually seeking for insights in the Sciences and the Humanities, in the ancient esoteric tradition of mysticism and in the temerarious, empirical practices of the latest, most heterodox therapies.

Here was the rarest of alloys—taste combined with temerity, daring speculation delivered in a perfect rendition of lucid and elegant restraint.

This blend of opposites gave to Aldous Huxley's mind a temper that was perhaps unique. It is certainly hard to imagine that an intellect of this extraordinary, idiosyncratic cast will again emerge. For now has ended that brief climate of thought in which so rare a species could appear, let alone so advanced a specimen flower.

We will not then be uttering empty eulogy if, in taking farewell, we say, "such was he as 'a man, and, take him all in all, we shall not look upon his like again'."

ALDOUS HUXLEY—A TRIBUTE

*Huston Smith*

WHEN ALDOUS HUXLEY was at M.I.T. in the fall of 1960, giving lectures which drew listeners so heavily that they jammed traffic all the way across the Charles River into Boston, I once spoke of those crowds as a tribute. "It's because I've been around so long," he replied. "I've become like Queen Anne's Cottage. If I live to be a hundred I shall be like Stonehenge."

He didn't live to be a hundred, and the world is the loser.

Most obviously, it has lost an encyclopedic intelligence. That adjective is overworked these days, but in his case it comes close to being exact. Indeed, when a leading journal felt that an encyclopedia—the Fourteenth Edition of the *Britannica*—itself needed to be brought under review, no one was surprised when Huxley was asked to do the job.

More impressive than the range of the man's mind, however, was its sympathy and interest. Few major intelligences since William James have been as open. Huxley's regard for mysticism was well known by dint of being so nearly notorious. What some overlooked was his equal interest in the workaday world and its exigencies: peace, the population explosion, and conservation of our natural resources. To those who, greedy for transcendence, deprecated the mundane, he counseled that "we must make the best of *both* worlds." To their opposites, the positivists, his word was, "All right, one world at a time; but not half a world!"

Accepting the fact that "truth lies at the bottom of a very muddy well," he descended: to ESP and LSD, to 'sight without glasses' and Vedanta. But never as martyred hero; there wasn't a grain of "Invictus" in him. If he lost his reputation, it was not for his omnivorous interests but because he wasn't content simply to do what he could do well. His competence bored him. So the master of words moved on to what eludes them, remarking over his shoulder that "language is a device for taking the mystery out of reality." Not needing triumph or adulation, he could bypass them for truth.

He could because he had so little egoism. A supreme unpretentiousness characterized him to the end. "It's a bit embarrassing," he

said, "to have been concerned with the human problem all one's life and find at the end that one has no more to offer by way of advice than 'Try to be a little kinder.'" If, as he had earlier remarked, the central technique for man to learn is "the art of obtaining freedom from the fundamental human disability of egoism," Huxley achieved that freedom.

But this wasn't his supreme achievement, for his personal problem was never pride so much as pessimism—"tomorrow, and tomorrow, and tomorrow, creeps in this pretty pace from day to day." His final victory, therefore, lay not in emerging selfless but in winning through to equanimity, to evenness of spirit and a generalized good-cheer. Thereby the line he used to close his best novel becomes the appropriate epitaph for his own life-story: "Of such is the Kingdom of Heaven." Said this time without sarcasm.

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SOME REMEMBRANCES OF ALDOUS HUXLEY

*Alan Watts*

I KNEW ALDOUS HUXLEY personally only after his so-called "mystical period" had begun, and had not by then read much of his earlier work of the *Point Counter Point* and *Chrome Yellow* period. I encountered him first through *Ends and Means*, *Brave New World*, and then *Grey Eminence*.

It was just after he had written the latter that I got in touch with him for the first time, and was wholly enchanted by the breadth and intricacy of his interests. He was a marvelous conversationalist. Every time I met him I felt charged in some way, as if a whole new world of ideas had been opened up to me. He was an entrancing talker. I well remember the day when we were having lunch at the Tokyo Restaurant in San Francisco, and his conversation reduced everyone at the neighboring tables to silence because they wanted to listen in.

When I first knew Aldous Huxley, he was in the beginning of the period in which he became interested in mystical experience and the transformation of consciousness. At that time I felt that he was following a type of mystical philosophy that rejected the material universe as a degraded mode of consciousness. It was about then that D. S. Savage wrote a critique of Huxley's work,

in the *Sevance Review*,\* saying that the old Huxley and the new Huxley were really just the same. Don't, he said, be deceived by the change. The old Huxley in *Point Counter Point* is a bitter and cynical man of destructive brilliance; he loves to pick people apart. But this is the same Huxley appearing now in the guise of a mystic, for in Eastern mysticism the object is to transcend and thus abolish personality and all differentiation. The ideal of dissolving the whole world of multiplicity and of form into a sort of undifferentiated morass is a new way of playing Huxley's old game.

There was, as I also felt, *some* truth in this at the time, but obviously Savage didn't know Huxley very well as a person. What was so striking about the man and his surroundings—the kind of house he lived in and the works of art he collected—was his actual fascination with the material world and his love of the good life. His prickly attitude, his critical-satirical point of view, was not really destructive: it was a defense of his own sensitivity. He was a very sensitive man indeed—too sensitive. Therefore he adopted a slightly aloof and superior attitude. After all, he and I went through the same kind of education—the British “public” school—and thus I understand not only his sexual preoccupations (as they come out in *The Genius and the Goddess*) but also the need for just this kind of “character armor.”

As the years passed—say from 1945 on—Aldous Huxley's philosophy made a definite progression. He became, in effect, a full-fledged Mahayana Buddhist, with the vision of the total union of the spiritual and physical domains. This is the Bodhisattva ideal, not of passing out of the world of form into the formless world of Nirvana, but of realizing the inner unity of Nirvana and the everyday world. He saw this unity not as one who, like a *laissez-faire* do-nothing reactionary, would leave the world as it is, but as one who incarnated the paradox that if you can see that the everyday world, *as it is*, is a divine manifestation, then and then *only* can you love it enough to want to change it in a constructive way. Otherwise people are changing the world not because they love it but because it is personally inconvenient to them.

This philosophy of “spiritual materialism” found its final expression in *Island*, a book with which I find myself in complete harmony, so far as its philosophical content is concerned. Huxley

\*Autumn, 1947. Reprinted in B. Rajan, ed., *The Novelist as Thinker*. London: Dobson, 1948.

made it a novel because the novelist was so largely his role and because the book had to be a counterpart to *Brave New World*. But as a writer of *fiction*, Huxley's skill in describing the ideal was not up to his skill in satirizing the real. Yet it must be admitted that for *any* artist the depiction of heaven is the hardest task of all—and thus the task in which he may most easily make a fool of himself. *Island* is a “thinly fictionalized” collection of essays on education, psychology, and metaphysics in which Huxley stuck out his neck as far as it would go. He advocated everything calculated to evoke the ridicule of sensible people—abolition of the sacred American family, free love, Tantric sex practices, drugs for inducing mystical experience, and the fantasy of the island paradise. He made himself a sitting duck for snickers in the literary reviews and scandal in the Sunday supplements.

But Huxley was no fool, and no sentimentalist. It is just in those “sore point” areas where the public defends itself by jeers without argument, that we find the most touchy and important issues of the time. Within twenty years it will be clear to all of us that Aldous Huxley had a genius for raising the right questions.

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#### THE LAST MESSAGE OF ALDOUS HUXLEY

Timothy Leary

NOVEMBER 22, 1963, was for Aldous Huxley the time to go.

In paying tribute (a curious word) to a departed luminary, it is customary to appraise his contribution, to wrap up the meaning and message of the hero and to place it with a flourish in the inactive file.

This ceremonial function is notoriously risky in the case of writers. The literary game has its own stock-exchange quotations in which hard-cover commodities rise and fall to the irrational dictates of scholarly fashion.

To predict the place that Aldous Huxley will have as a literary figure is a gambling venture we shall leave to the professionals who are paid to do it. They might note that he did not win a Nobel prize—a good sign, suggesting that he made the right enemies and was properly unacceptable to the academic politicians. They will note also that he was a visionary—always a troublesome issue to the predictor.

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Since all visionaries say the same thing they are perennial commodities, difficult to sell short, annoyingly capable of turning up fresh and alive a thousand years later.

But Aldous Huxley is not just a literary figure, and for that matter not just a visionary writer. Which adds to the critic's problem. The man just wouldn't stop and pose for the definitive portrait. He just wouldn't slide symmetrically into an academic pigeonhole. What shall we call him? Sage? Wise teacher? Calypso guru? Under what index-heading do we file the smiling prophet? The nuclear age bodhisattva?

Many of the generation of scholars and critics who presently adjudicate literary reputations received their first insights into the snobbish delights of the mind from the early novels of Huxley.

"... I believe that no one under fifty can quite realize how exciting Huxley seemed to us who were schoolboys or undergraduates in the 'twenties... he was a popularizer of what, at the time, were 'advanced' ideas... he was a liberator, who seemed to encourage us in our adolescent revolt against the standards of our parents."<sup>1</sup>

This obituary appraisal, a nice example of the "cracked looking glass" school of literary criticism, continues in the same vein:

"I remained under the Huxleyan enchantment well into my twenties. The magic began gradually to fail after *Point Counter Point* (1928); its failure was due partly to my discovery of other contemporary writers (Proust, Joyce, Lawrence), partly to the fact that Huxley himself had by that time lost something of his original sparkle. I felt little sympathy for his successive preoccupations with scientific utopias, pacifism, and Yoga..."

Of all the misunderstandings which divide mankind, the most tragic, obvious, and vicious is the conflict between the young and the old. It is surely not Huxley who lost his sparkle but perhaps the quoted critic, who graduated from "adolescent revolt" (a dubious, ungracious middle-aged phrase) to a static "post-adolescent" fatigue with new ideas. Huxley continued to produce prose which sparkled, to those who could transfer their vision from the mirror to the events which were occurring around them.

I believe that no one over fifty can quite realize how exciting Huxley seems to the generations which followed their own. The

<sup>1</sup>"The Wicked Uncle: An Appreciation of Aldous Huxley," by Jocelyn Brooke. *The Listener* (London), Vol. LXX, No. 1811 (Dec. 12, 1963), p. 991.

## Editorials

early Huxley was the urbane sophisticate who taught naive youngsters that parental notions about sex and society left something to be improved. The early Huxley was an exciting coach in the game of intellectual one-upmanship, wickedly demonstrating how to sharpen the mind so that it could slice experience into categories, how to engage in brilliant witty repartee, how to be a truly sophisticated person.

But, "Then came *Brave New World* (1932), an entirely new departure, and not, I think, a happy one..." Yes indeed. Then comes the grim new world of the 1930's and a new generation who were less concerned with sparkling conversation than with trying to figure out why society was falling apart at the seams. The game of polishing your own mind and developing your own personality (although kept alive in the rituals of psychoanalysis) starts to look like narcissistic chess. Huxley was one of the first men of his times to see the limitations of the obsession with self and never again wrote to delight the intellectual.

But old uncles are supposed to keep their proper place in *my* picture album. They have no right charging off in new directions. Investigating meta-self social ideas and meta-self modes of consciousness. No right to calmly ask the terrible new questions of the mind: is this all? Shakespeare and Joyce and Beethoven and Freud—is there no more? Television and computers—is this all? Uncle Aldous who taught us how to be clever, rational, individualistic, now claims that our sharp minds are creating air-conditioned, test-tube anthills. "... as Mr Cyril Connolly put it, 'science had walked off with art', and a latent streak of vulgarity found expression..." Yes, the specific prophecy is vulgar.

And what is even more tasteless—to be so right. Within fifteen years the ludicrous, bizarre mechanization of new world fantasy had become a reality. The conventional artistic response to automation is the nihilist protest. But again Aldous Huxley refuses to play the literary game, insists on tinkering with evolutionary resolutions. Some of us forgot that Uncle Aldous was also grandson. The extraordinary, dazzling erudition which spun out *bons mots* in the early novels is now sifting through the wisdom of the east.

Huxley's diplomatic journey to the east brings back no final answer but the right questions. He seeks the liberating seed while avoiding the deciduous underbrush of ritual.



The first question: is there more? Need the cortex be limited to the tribal-verbal? Must we use only a fraction of our neurological heritage? Must our minds remain flimsy toys compared to the wisdom within the neural network? How to expand consciousness beyond the learned mind? How to find and teach the liberation from the cultural-self? Where are the educational techniques for exploiting the potentials? Here again Huxley avoids doctrinaire digressions into mood, authority, semantics, ritual. He keeps moving; looking for the key which works.

In 1954 he announces the discovery of the eastern passage. *Doors to Perception. Heaven and Hell.* Psychedelic drugs can provide the illumination, the key to the mind's antipodes, the transcendental experience. You may not want to make the voyage. You may have no interest in transcending your cultural mind. Fine. Don't take LSD. Or you may want illumination but object to the direct, short-cut approach. You prefer the sweat-tears of verbal exercises and rituals. Fine. Don't take LSD. But for those who can accept the "gratuitous grace," there it is.

The age-long problem of how to "get out" has finally been solved. Biochemical mysticism is a demonstrated fact. Next comes the second problem. There is the infused vision of the open cortex, flashing at speeds which far outstrip our verbal machinery. And there is the tribal marketplace which cannot utilize or even allow the accelerated neural energy. How can the gap be bridged?

Aldous Huxley preached no escape from the insanity and semantic madness of the 20th century. His next message was not one of quietism and *arhat* passivity. No one was more concerned, more engaged, more involved in the active attempt to make the best of both worlds.

To make the best of both worlds—this was the phrase we heard him repeat over and over again during the last years. Of course most of his readers and critics didn't know what he was talking about. If you don't realize that it is now a simple matter to reach ecstasy, to get out, to have the vision, to reach the other worlds of your own cortex, then technical discussions of "reentry" problems make little sense to you.

But there it was. The old *Mahayana* question now made real and practical. How to apply the now-available potentialities of the accelerated cortex?

ALDOUS HUXLEY'S LAST MESSAGE to the planet contains the tains the answer to this question in the form of the utopian novel, *Island*.<sup>2</sup>

This book, published in 1962, is the climax of the 69-year voyage of discovery. It is a great book. It will become a greater book.

Like all great books it is misunderstood in its time because it is so far in front of its time. It's too much to take. Too much. *Island* is a continent, a hemisphere, a galaxy of a book.

At the most superficial level it's a science-fiction tale with heroes and villains in a fantasy land. It's a satire as well—of western civilization and its follies. So far, the book can be dealt with.

But it's much more. It's a utopian tract. Huxley's final statement about how to make the best of both worlds. Of individual freedom and social responsibility. Of East and West. Of left and right cerebral hemispheres. Of action and quietism. Of *Tantra* and *Arhat*. Of verbal and non-verbal. Of work and play. Of mind and meta-mind. Of technique and nature. Of body and spirit. Of religion and the secular.

It's a manual on education. A handbook on psychotherapy and mind control. A solution to the horrors of the bi-parent family, the monstrous father-mother pressure cooker.

Too much, indeed, for one book; but there's more.

*Island* is a treatise on living, on the living of each moment.

And most important and staggering, the book is a treatise on dying.

The easy intellectual rejection of this wealth of practical, how-to-do-it information is to call it fantasy. Adolescent daydreams about how things could be, in a society imagined and run by gentle, secluded scholars.

But here is the terrible beauty of Huxley's science-fiction-satirical-utopian manual on how to live and how to live with others and how to die and how to die with others: it's all based on facts. *Island* is a popular presentation of empirical facts—anthropological, psychological, psychedelic, sociological. Every method, every social sequence described in *Island* is based on data. Huxley's utopian

<sup>2</sup>New York: Harper & Row, 1962 (London: Chatto & Windus; Toronto: Clarke, Irwin). Paperback from Bantam Books, N. Y., 1963.



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ideas can work because they have worked. It's all been done—not in a fantasied future but yesterday.

It has been tried and done by Huxley himself, and by his "Palanese" wife Laura Archera Huxley, who presented many of these intensely practical down-to-earth ideas in her book, *You Are Not The Target*.<sup>3</sup> It's a mistake to think of him as a detached novelist observing and commenting on the scene. Huxley was a tall, slightly stooped Calypso singer—intensely topical—strolling near-sightedly through the crowds, singing funny stilted verses in an English accent, singing about the events in which he is participating. He didn't just figure it out—he experienced much of it himself.

Huxley's explorations with psychedelic drugs are an example of his engagement. His willingness to get involved. Remember, every person who can read without moving his lips has heard about what the *Saturday Evening Post*<sup>4</sup> calls "the dangerous magic of LSD." And despite the controversy, almost everyone knows what is involved—the mind-loss and the vision. Everyone has had to come to terms with the new development in his own fashion.

There are as many rational reasons for not taking LSD as there are facets to the human mind—moral, practical, medical, psychiatric, mental. The real reason—however it is expressed—is fear. Fear of losing what we have. Fear of going beyond where we are.

Aldous Huxley had spent years preparing himself for the fearful psychedelic voyage, and he made it without question when it presented itself. Why? Duty? Curiosity? Conviction? Courage? Faith in the process? Trust in his companions—divine or human?

He did it, and the world will never forget it.

But the gamble of the mind was not the last act of faith and courage. Aldous Huxley went on to face death as he had faced the whirling enigma of the life process. He tells us about it with poetic sensitivity and concrete specificity in the fourteenth chapter of *Island*, his book of the living and the dying.

Rounding a screen, he caught a glimpse . . . of a high bed, of a dark emaciated face on the pillow, of arms that were no more than parchment-covered bones, of claw-like hands . . . He looked at the face on the pillow . . . still, still with a serenity that might almost have been the frozen calm of death . . .

"Lakshmi." Susila laid a hand on the old woman's wasted arm.

"Lakshmi," she said again more loudly. The death-calm face remained impassive. "You mustn't go to sleep."

. . . "Lakshmi!"

The face came to life.

"I wasn't really asleep," the old woman whispered. "It's just my being so weak. I seem to float away."

"But you've got to be here," said Susila. "You've got to know you're here. All the time." She slipped an additional pillow under the sick woman's shoulders and reached for a bottle of smelling salts that stood on the bed table. . . . Then after another pause, "Oh, how wonderful," she whispered at last, "how wonderful!" Suddenly she winced and bit her lip.

Susila took the old woman's hand in both of hers. "Is the pain bad?" she asked.

"It would be bad," Lakshmi explained, "if it were really my pain. But somehow it isn't. The pain's here; but I'm somewhere else. It's like what you discover with the *moksha*-medicine. Nothing really belongs to you. Not even your pain."

. . . "And now," Susila was saying, "think of that view from the Shiva temple. Think of those lights and shadows on the sea, those blue spaces between the clouds. Think of them, and then let go of your thinking. Let go of it, so that the not-Thought can come through. Things into Emptiness, Emptiness into Suchness. Suchness into things again, into your own mind. Remember what it says in the Sutra. 'Your own consciousness shining, void, inseparable from the great Body of Radiance, is subject neither to birth or death, but is the same as the immutable Light, Buddha Amitabha.'"

"The same as the light," Lakshmi repeated. "And yet it's all dark again."

"It's dark because you're trying too hard," said Susila. "Dark because you want it to be light. Remember what you used to tell me when I was a little girl. 'Lightly, child, lightly. You've got to learn to do everything lightly. Think lightly, act lightly, feel lightly. Yes, feel lightly, even though you're feeling deeply' . . . Lightly, lightly—it was the best advice ever given me. Well, now I'm going to say the same thing to you, Lakshmi . . . Lightly, my darling, lightly. Even when it comes to dying. Nothing ponderous, or portentous, or emphatic. No rhetoric, no tremolos, no self-conscious persona putting on its celebrated imitation of Christ or Goethe or Little Nell. And, of course, no theology, no metaphysics. Just the fact of dying and the fact of the Clear Light. So throw away all your baggage and go forward. There are quicksands all about you, sucking at your feet, trying to suck you down into fear and self-pity and despair. That's why you must walk so lightly. Lightly, my darling . . . Completely unencumbered."

<sup>3</sup>N.Y.: Farrar, Straus & Co., 1963. (Foreword by Aldous Huxley.)

<sup>4</sup>November 2, 1963.

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. . . He looked again at the fleshless face on the pillow and saw that it was smiling.

"The Light," came the hoarse whisper, "the Clear Light. It's here—along with the pain, in spite of the pain."

"And where are *you*?" Susila asked.

"Over there, in the corner." Lakshmi tried to point, but the raised hand faltered and fell back, inert, on the coverlet. "I can see myself there. And she can see my body on the bed."

"Can she see the Light?"

"No. The Light's here, where my body is." . . .

"She's drifted away again," said Susila. "Try to bring her back."

Dr. Robert slipped an arm under the emaciated body and lifted it into a sitting posture. The head drooped sideways onto his shoulder.

"My little love," he kept whispering. "My little love . . ."

Her eyelids fluttered open for a moment. "Brighter," came the barely audible whisper, "brighter." And a smile of happiness intense almost to the point of elation transfigured her face.

Through his tears Dr. Robert smiled back at her. "So now you can let go, my darling." He stroked her gray hair. "Now you can let go. Let go," he insisted. "Let go of this poor old body. You don't need it any more. Let it fall away from you. Leave it lying here like a pile of worn-out clothes."

In the fleshless face the mouth had fallen cavernously open, and suddenly the breathing became stertorous.

"My love, my little love . . ." Dr. Robert held her more closely. "Let go now, let go. Leave it here, your old worn-out body, and go on. Go on, my darling, go on into the Light, into the peace, into the living peace of the Clear Light . . ."

Susila picked up one of the limp hands and kissed it, then turned . . .

"Time to go," she whispered . . .

## Notes on the Present Status of Ololiuhqui and the Other Hallucinogens of Mexico \*

R. GORDON WASSON

*Picietl, peyotl, teonanacatl, and ololiuhqui*—these were the four great divinatory plants of Mexico at the time of the Conquest. We give the names in Nahuatl, the *lingua franca* of that time, spoken as a mother tongue by the Aztecs and many other peoples. By 'divinatory' we mean plants that served in Middle American cultures as keys to knowledge withheld from men in their normal minds, the keys to Extra-sensory Perception, the Mediators (as the Indians believed) between men and their gods. These plants were hallucinogens, psychotropic agents, psychotomimetics, if we must use the nonce words of contemporary science.

Among the remote monolingual peoples of Mexico these plants continue to this day playing their divine role. Whenever the Indian family is troubled by a grave problem, it is likely to turn to one or the other of these plants and consult it according to the usage prevailing in the region. There were other drugs, certainly, that belong to the same class, and of these more will be said later. But if we may rely on the number and quality of the witnesses, the importance that they attribute to these plants, and the strangely moving episodes that they tell us of the Indians' utter faith in and defense of them—then these four were preëminent.

The civilization of Europe had known nothing like these novel drugs of Mexico, at least not in recorded history. Similar miraculous

\*This and the following article are reprinted, with slight corrections, from *Botanical Museum Leaflets*, Harvard University, Vol. 20, No. 6, Nov. 22, 1963, pp. 161-212.

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powers were attributed, in a way, to the Elements in the Mass; and the Catholic Church in Mexico was quick to perceive this, to it, alarming parallel. But belief in the divinity of the Sacrament called for an act of faith, whereas the Mexican plants spoke for themselves. In a number of situations the record is clear: the friars conceded the miracles wrought by these agents<sup>1</sup> but attributed them to the machinations of the Evil One. Root and branch, the Church strove to extirpate what is called this superstition, this idolatry of the miracle-working plants. The Church was unsuccessful; just how unsuccessful can be seen from the fact that these plants are taken today, throughout the Indian country, in ceremonials invoking the very name of the Virgin Mary, of the Saints (especially St. Peter and St. Paul), of Our Lord. The accessories to the rite are sold in every market place, at a special stall, often in the shadow of the parish church. The miracle-working plants pass from hand to hand by private arrangement; they are never exposed like ordinary garden produce. The rite takes place in midnight vigils, sometimes accompanied by stirring age-old chants in the vernacular. The Indians attending these rites may include prominent lay officials of the church; rumor hath it that in certain places the priest is the leading *curandero*. Let it not be forgotten that the primary use of the sacred plants was and continues to be religious—and by the same token medicinal. Religion and medicine have not yet been separated out in many of the Indian communities.

### *Piciell* — *Nicotiana rustica* L.

The bright green powder of *piciell* leaves is familiar all over the Indian country in Mexico. The *curandero* rubs it on the skin, over the forearms, temples, stomach, legs. It is this that constitutes a *limpia* or ritual cleansing. Formerly, when mixed with one part of lime to ten of *piciell*, it was made into a wad that the Indian inserted between teeth and gums and sucked, much as the Quechua sucks coca, to give him strength. The friars inveighed against *piciell* with a vehemence that is proof of its importance in the native culture. It is still indispensable in the religious life of the Indians. Is it possible that *piciell* has pharmacological properties not yet discovered by science? May there be surprises for us in this plant?

*Piciell* is *Nicotiana rustica* L., a sister species to our ordinary tobacco, *Nicotiana Tabacum* L. They both grow in Mexico. In Nahuatl together they are *yettl*, the former alone was *piciell* (now in the vernacular *pisiete*), the latter alone was *quanhyettl*. Tobacco was

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already widely diffused throughout the Americas at the time of the Conquest. The Spaniards found it in the Antilles, the Portuguese in Brazil, the English in Virginia. Along with the plant the Spaniards took the name 'tobacco' from the Taino people of Hispaniola and Cuba. Long since dead and gone, this Arawakan tribe bequeathed to the world a legacy of important words that gives us an engaging image of a blameless people: 'canoe', 'hammock', 'tobacco', 'maize', and 'potato', not to speak of a sixth, 'barbecue', that is in vogue today. And so the Tainos, cultivating their maize and sweet potatoes, smoking tobacco in their hammocks, paddling their canoes to the neighboring barbecue, were destined to be exterminated by the ferocious Caribs and the Europeans!<sup>2</sup>

The use of tobacco spread throughout the world with epidemic speed. European explorers penetrating to lands far distant in Africa and Asia sometimes found that tobacco had reached there before them. Even the Church did nothing to combat it—outside of Mexico, that is. The French *abbé* with his snuff box is a familiar figure in Europe's cultural history.

### *Peyott* — *Lophophora Williamsii* (Lem.) Coult.

The history of *peyott*, known to science as *Lophophora Williamsii* (Lem.) Coulter, has been utterly different but equally spectacular. A cactus,<sup>3</sup> it is by that fact exclusively a New World plant, native to the arid regions of northern Mexico—to Coahuila, Zacatecas, San Luis Potosí, and Querétaro. Presumably the plant in colonial times grew only in the north, but its use extended south as far as the state of Oaxaca.<sup>4</sup> Today the Indians of central and southern Mexico seem to know it no longer. But the Indians of the north still consume it in their religious ceremonies, and it is extending its range, inching its way northward from tribe to tribe in the Plains area until it has now finally reached Canada. In the same spirit of blind misunderstanding that actuated the Church in colonial Mexico, there are elements in the North American community that would invoke the police and courts to stop a practice that gives spiritual solace to our surviving Indian population.

On a different cultural plane, *peyott* made its bow in the great world in 1888, when the toxicologist Louis Lewin of Berlin published the first paper attempting to classify it botanically and describing its sensational qualities. He was followed by Dr. S. Weir Mitchell (1896) and Havelock Ellis (1897), men who commanded wide attention in the English-speaking world.<sup>5</sup> These papers served to

alert the scientific and learned world to a new order of vegetable product, and opened the sluice-gates to an astonishing flow of discussion and experimentation. Though a booster dose was hardly needed, Aldous Huxley gave the theme a new dimension when he published his *The Doors of Perception* in 1954 and *Heaven and Hell* in 1955.<sup>6</sup>

The bibliography on *peyotl* is enormous: one North American anthropologist, Weston La Barre, has devoted an important part of his professional life to keeping up with it and chronicling current developments.<sup>7</sup> The question presents itself seriously whether the output of articles can be laid solely to the scientific interest of a strange drug, or whether supplementing this there is a subjective effect that compels those who have eaten the plant to embark upon a mission to make known what they have experienced.

*Peyotl* (which has commonly been eroded to 'peyote') is a Nahuatl word. Alonso de Molina in his *Vocabulario* (1571) gives its meaning as *capullo de seda, o de gusano*, 'silk cocoon or caterpillar's cocoon,' which fits well the small woolly cactus that is its source. This is probably the explanation. Others<sup>8</sup> cite a number of similar words in Nahuatl that invoke splendor or illumination. May these words not be secondary, having been born of the splendor of the visions that *peyotl* gives? For reasons that seem to have sprung from popular confusion, the English-speaking population of the Southwest came to call the dried *peyotl* 'mescal buttons.' Lewin, Mitchell, and Ellis, by their use of the term, fixed this grievous misnomer in the English language. Later, when the active agent came to be isolated, the chemists called the alkaloid 'mescaline', thus compounding the mistake. 'Mescal' comes from the Spanish of Mexico *mezcal*, derived in its turn from Nahuatl *mexcalli*, the name for the agave, *maguey*, or century plant from which pulque is made, which, when distilled, yields *mezcal*. *Mezcal* has nothing to do with 'mescal buttons' or 'mescaline'. This confusion is the lexicographers' nightmare, as can be seen in many English-language dictionaries where erroneous citations are given under the respective meanings of the word.

On the other hand there is an important *mejicanismo* that has largely escaped the lexicographers: *piule*, a generic name in Mexico for the hallucinogens. J. J. Santamaría traces it to Zapotec, in my opinion on insufficient grounds. I have heard it applied to hallucinogenic mushrooms among the Zapotec-speakers of the Sierra Costera, at San Agustín Loxicha: *piule de barda*, *piule de cheris*, these being distinct species of such mushrooms, or simply *piule*.<sup>9</sup> Does it not stem

from *peyotl*, thus: *péyotl/péyutl* → *peyúle* → *piule*? As Dr. Aguirre Beltrán has shown us, in early colonial times *peyotl* was in use in Oaxaca. The present-day currency of the word among some monolingual Zapotecs might come down from that period.

#### *Teonanacatl* — 'God's flesh'

At least twenty-five of our early sources, many of them among our most important, speak of *teonanacatl*, 'God's flesh',<sup>10</sup> the sacred mushrooms of Middle America. Bernardino de Sahagún refers to them repeatedly and at some length. He gives in Nahuatl the text of his native informants. Of the Nahuatl poems preserved for us, one mentions them, and probably others refer to them metaphorically. There are miniatures of them in two of the early codices. We in the 20th Century would have expected the European in colonial Mexico to try them out, to satisfy his curiosity as to their properties. There is no record of any such experiment. The Spaniards (if we may judge by their words) at first rejected them with horror and loathing as an abomination, and in the ensuing centuries simply ignored them.

Such was this neglect that in 1915 William E. Safford, a North American economic botanist of established reputation, found it possible to read a major paper before a learned society, afterwards published in a respectable learned journal, denying that there had ever been sacred mushrooms in Mexico.<sup>11</sup> Virtually no one challenged him. In a world indifferent to such matters, torn by warfare, his arguments won by default. Only a single thin voice was raised in persistent protest, the voice of Dr. Blas Pablo Reko, a Mexican citizen born in Austria of Slavic family background, a tireless and enthusiastic field worker but one given to fanciful theories and so not taken seriously.<sup>12</sup> He kept insisting not only that the mushrooms had existed but that the cult survived in places off the beaten track in Oaxaca.

Twenty years went by until, one day in 1936, Ing. Roberto J. Weitlaner got his hands on some of the sacred mushrooms in Huautla de Jiménez. He sent them to Reko, who forwarded them to Harvard, where they arrived in such a state that they could not be identified. On the record Ing. Weitlaner was the first white man in modern times to have seen the *teonanacatl*. Two years later, on July 16, 1938, his daughter Irmgard, with the young anthropologist who was destined to become her husband, Jean Bassett Johnson, together with two others, Bernard Bevan and Louise Lacaud, attended a mushroom rite in Huautla, in the home of José Dorantes. Johnson later gave

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a full account of the event.<sup>13</sup> So far as the sources go, they were the first white persons to attend such a ceremony.

One month later, in mid-August, the Harvard botanist Richard Evans Schultes, also in Huautla, received from native informants specimens of three species that they said were of the sacred class. He took them back to Cambridge. His field notes describe with unmistakable precision the species that was to be defined in 1956 by Roger Heim as *Psilocybe caerulescens* Murr. var. *mazatecorum* Heim.<sup>14</sup> Dr. David Linder, Harvard mycologist, confirmed another as *Panaeolus campanulatus* L. var. *sphinctrinus* (Fr.) Bresad. Some time later the third species was identified at Harvard by Dr. Rolf Singer as *Stropharia cubensis* Earle,<sup>15</sup> but he did not disclose his discovery, not even to Schultes, until many years later when it was too late to serve a purpose.

Then the Second World War supervened. Johnson was killed in North Africa in 1942. Reko died in 1953. Schultes' activities were diverted to other geographical regions. The outside world had been on the brink of discovering the Mexican mushrooms, but the war blanketed everything and the mushrooms slipped back into the well of the forgotten.

Meanwhile the matter was being approached from an altogether different angle in New York, by the Wassons, husband and wife, who had spent more than two decades gathering data on the role of mushrooms in primitive societies in Eurasia. This theme in anthropology, which we called *ethnomycology*, had never before been explored in the West. Eurasia embraced so many cultures and so much history and literature that we had resolved early in our inquiries to stop with Eurasia and leave Africa and the Americas to others. Our Eurasian studies had led us to formulate a bold surmise: *viz.*, that mushrooms had played a religious role in the lives of our remote ancestors, a role far more important than the world had supposed. We were still preoccupied with this idea when in September 1952, suddenly, we learned that a mushroom cult had been reported in 16th Century Mexico. On receipt of this, to us, sensational news, we resolved to embark upon a quest for surviving traces of that cult. At the time we knew nothing, absolutely nothing, about the cultures of Middle America. What awaited us in Mexico turned out to exceed our most sanguine anticipations, in the intellectual adventure of discovering for ourselves the rich Indian cultures of Middle America and in our rediscovery of the rite of the sacred mushroom.

In the beginning we discovered Ing. Roberto J. Weitlaner. With-

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out minimizing what we owe to others, I rejoice that this occasion presents itself when I may properly define my debt to him.\* He led us by the hand on our first excursion on muleback into the Indian country, to Huautla de Jiménez; on my second trip to Mazatlán de los Mixes; then on my visits to San Agustín Loxicha in the Sierra Costera, and to the Mazahua country. For ten years I have had repeated recourse to him, to tap his immense knowledge of the Indians, their ways, their languages, their history. He has guided my steps in the libraries, unearthed apt quotations in the sources bearing on our theme, introduced me to others working in the field who could also pin down facts. His patience, good humor, and *joie de vivre*, in the Sierra and in Mexico City, are unfailing. But above all else I have tried to learn from him his secret of dealing with the Indians. The Indians are simply living by the conventions of an orally transmitted culture such as our own forebears lived by only a little while ago. When you visit their villages you make allowances for this time lag. You do not treat them kindly as inferiors or children. You do not treat them *as though* they were equals. The Indians are quick to see through such fronts. Ing. Weitlaner taught us to treat the Indians *as equals*—a secret simple yet elusive. As the poet said, truly 'this is the famous stone that turneth all to gold.'

The news of the Mexican sacred mushrooms burst upon the world in the spring of 1957 with the publication of our book, *Mushrooms, Russia & History*, and our articles in the popular magazines.<sup>16</sup> Roger Heim, Membre de l'Institut, Director of the Muséum National d'Histoire Naturelle, visited the Indian country of Mexico three times in response to our invitation, seeking out the sacred mushrooms. He identified fourteen species belonging to three genera—*Psilocybe*, *Stropharia*, and *Conocybe*—besides a number of subspecies. Most of them were new to science, although they had been known to the Indians for centuries, probably millennia. Dr. Albert Hofmann in the Sandoz laboratories of Basel undertook the delicate task of isolating the active agents, defining their molecular structure, and finally synthesizing them. By 1958, a surprisingly short time, he had accomplished his work. Many investigators began to study the properties of *psilocybine* and *psilocine*, as Dr. Hofmann called the active agents, and their possible use. In a recent bibliography I have

\*This paper was written in honor of Robert J. Weitlaner on the occasion of his 80th birthday and will be published in Spanish in the *Homenaje* edited under the auspices of a committee headed by Dr. Alfonso Caso in Mexico City.

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listed some 200 papers on work with these mushrooms that have already appeared in the past five years, in learned and scientific journals;<sup>17</sup> not to speak of the hundreds of articles that have come out in a score of countries in the lay press. Here again there seem to be signs that those who have experienced the mushrooms feel a compulsion to impart to others the staggering effects of *teonanacatl*.

### *Pipiltzintzintli* — *Salvia divinorum* Epling & Jávito

Though *teonanacatl* has been rediscovered and identified, there still remain other plants classed with it in the colonial sources as possessed of divine (or Satanic) attributes that defeat our efforts at interpretation. Both Sahagún and Juan de Cárdenas refer to a plant that they call respectively *pojomatli* or *pojomate*,<sup>18</sup> grouping it with other hallucinogens. Its identity is unknown. In his *Medicina y Magia* Dr. Aguirre Beltrán cites other references to this plant in the unpublished records of the Inquisition. He likewise supplies numerous references to a second plant that belongs in the divinatory group, a plant the name of which is variously spelled in his sources but that he thinks in the original Nahuatl should be *pipiltzintzintli*.<sup>19</sup> Its identity, too, is unknown. The plant grew in the area where *ololiuhqui* flourished; but whereas *ololiuhqui* is the seed of a morning glory, the seed of *pipiltzintzintli* is never mentioned. It is called an *hierba*, never an *hiedra* or *bejuco* like the morning glory. There was a *macho* and an *hembra*, or male and female varieties. It was cultivated.

All of these attributes fit the *hojas de la Pastora* that the Mazatecs generally use as a divinatory plant. In September 1962 we gathered specimens of the *hojas de la Pastora*, and they were found to be a species new to science: Epling and Jávito named it *Salvia divinorum*.<sup>20</sup> Among the Mazatecs I have seen only the leaves ground on the *metate*, strained, and made into an infusion. The colonial records speak of an infusion made from the roots, stems and flowers. But this is not incompatible with our information about *Salvia divinorum*: the Mazatecs may confine themselves to the leaves of a plant that has the divine virtue in all its parts. I suggest that tentatively we consider *pipiltzintzintli*, the divine plant of pre-Conquest Mexico, identical with the *Salvia divinorum* now invoked in their religious supplications by the Mazatecs.

Of divinatory plants in use today that could have been used in Middle America before the Conquest, we have had experience with two: *toloache*, presumably the seeds of *Datura meteloides* Dun., and *colorines*, the seeds of *Rhynchosia pyramidalis* (Lam.) Urb. Though

## PLATE I



Flowering *Salvia divinorum* E. & J., 'hojas de la Pastora', held by Irmgard Weitlaner Johnson. 1962.  
Photo by Wasson

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I know of no references to *colorines* in colonial sources, I think that they are present in the famous Tepantitla fresco where strings of seeds and mushrooms are falling from the hand of Tlaloc, and where some of the seeds are red and black, with the hilum distinctly placed in the red field.<sup>21</sup> On the slopes of Popocatepetl the sacred mushrooms are still taken with *colorines*. It is vital that the hilum be in the red field; if it is in the black patch, it is the toxic seed of *Abrus precatorius* L., also called *colorines* and much used for beads by the Veracruzanos.

### *Ololiuhqui*—*Rivea corymbosa* (L.) Hall. fil.\*

#### Note by R. E. Schultes:

\*There have recently been suggestions that the correct name of *ololiuhqui* is *Turbina corymbosa* (L.) Raf.

These suggestions arise from two articles which have appeared in the past several years: Roberty, G.—“Genera Convolvulacearum” in *Candollea* 14 (1952) 11-60; Wilson, K. A.—“The genera of Convolvulaceae in the southeastern United States” in *Journ. Arn. Arb.* 41 (1960) 298-317.

Roberty separates *Ipomoea*, *Rivea* and *Turbina*, putting the three into different subfamilies. He keeps in *Rivea* only one species of India and Ceylon. In *Turbina*, he has three species: *T. corymbosa* (which he states occurs in tropical America, the Canary Islands and the Philippines) and two other species of Mexico.

Wilson, in a key to the genera of Convolvulaceae in the southeastern states, separates out *Turbina* as a genus distinct from *Ipomoea*. While *Turbina* is keyed out as a distinct genus, there is no technical consideration of it in the body of the paper which follows the key. One must assume, consequently, that *Turbina* (as conceived by Wilson) does not occur in southeastern United States. There is, furthermore, no reference to the binomial *Turbina corymbosa* as such. Wilson pointed out that: “Generic lines are difficult to draw in this family, and treatments vary with different authors depending upon the emphasis placed on the taxonomic characters used . . .”

The question of whether to use the binomial *Rivea corymbosa*, or to assign the concept to *Ipomoea* on the one hand or *Turbina* on the other is, in effect, one of personal evaluation, by botanists, of the importance of characters.

When I first discussed *ololiuhqui* in 1941 (Schultes, R. E.: “A contribution to our knowledge of *Rivea corymbosa*, the narcotic *ololiuhqui* of the Aztecs”), I looked into the problem of the generic

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position of the concept. I decided that, if indeed one were justified in separating this concept from *Ipomoea*, it must be accommodated in *Rivea*. The outstanding Argentine specialist on the Convolvulaceae, the late Dr. Carlos O'Donell, who was spending a year at Harvard University at that time, worked with me closely in this study and was in complete agreement. I have studied this problem again in connection with Wasson's recent work and see no reason to change my opinion. Furthermore, it is clear that such an authority as the late Professor E. D. Merrill referred this concept to *Rivea*, placing *Turbina* in synonymy under *Rivea* and *T. corymbosa* in synonymy under *R. corymbosa*.

In view of the fact that such authorities as O'Donell and Merrill elected to use *Rivea corymbosa*; that Wilson acknowledges that “the entire family is in need of intensive study and . . . all characters must be thoroughly re-evaluated”; that Roberty's article is hardly conservative and actually adds little to our basic knowledge of the family; and that the ethnobotanical and chemical literature has accepted *Rivea corymbosa*—in view of all these circumstances perhaps we might well continue to use the best known name until a really comprehensive study by a recognized specialist indicates that it is wrong.

*Rivea corymbosa* (L.) Hallier fil. in *Engler Bot. Jahrb.* 8 (1893) 157.

*Convolvulus corymbosus* Linnaeus *Syst. Nat. Ed.* 10, 2 (1759) 923.

*Ipomoea corymbosa* (L.) Roth *Nov. 11. Sp. Ind. Orient.* (1821) 109.

*Turbina corymbosa* (L.) Rafinesque *Fl. Tellur.* 4 (1838) 81.

The least known in the outside world of our quartet of major Mexican divinatory agents is *ololiuhqui*;<sup>‡</sup> yet it is perhaps the best known and most widely used among the Indians of that country. In the race for world attention *ololiuhqui* has been a slow starter. Beyond the confines of the Sierra Madre few except specialists have heard of it, and the bibliography on it is short. But its properties are as sensational as those of *teonanacatl* and *peyotl*. Its identity was settled in 1941. The enigma of its chemistry was resolved in 1960 when, on August 18 of that year, Dr. Albert Hofmann read his paper in Australia before an audience of scientists, many of whom

<sup>‡</sup>Although the spelling *ololiuhqui* has gained wide acceptance and is now the commonest orthography, linguistic evidence indicates that this Nahuatl word is correctly written *ololiuhqui*.



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were plainly incredulous, so astonishing were his findings.<sup>22</sup> In the following article he himself rounds out and completes his discoveries, and I shall not anticipate them here.

*Ololiuhqui* in Nahuatl is the name of the seeds, not of the plant that yields the seeds. The word means 'round thing', and the seeds are small, brown, and oval. The plant itself is a climber, called appropriately *coaxihuitl*, 'snake-plant', in Nahuatl, and *hiedra* or *bejuco* by the Spanish writers. It is a morning glory, and it grows easily and abundantly in the mountains of southern Mexico. Unlike *teonanacatl*, it bears seed over months, and the seed can be kept indefinitely and carried far and wide to regions where the plant itself does not grow. In Spanish it is commonly known as *semilla de la Virgen*, and in the various Indian languages there are names for it that should be carefully assembled by teams of linguists and then studied for their meanings and associations. In Oaxaca, only among the Trique of Copala have I found no familiarity with it.

Past experience has shown that for a divinatory plant to enlist the attention of the outside world two steps are usually necessary. First, it should be correctly and securely identified. Second, its chemistry should be convincingly worked out. Richard Evans Schultes settled the identity of *ololiuhqui* in the definitive paper published in 1941.<sup>23</sup> It is the seed of a species of *Convolvulaceae*: *Rivea corymbosa* (L.) Hall. fil. Schultes was not the first to link *ololiuhqui* with this family, but for decades there had been disputes over its identity, and since Schultes published his paper there has been none. The starting point for any student of the subject is Schultes's paper.

It is not my intention here to tell over again the story told by Schultes. I will only supplement what he had to say with this observation. In the writers of the colonial period *ololiuhqui* receives frequent mention, especially in the *Tratado* of Hernando Ruíz de Alarcón. Throughout these references there runs a note of sombre poignancy as we see two cultures in a duel to death—on the one hand, the fanaticism of sincere Churchmen, hotly pursuing with the support of the harsh secular arm what they considered a superstition and an idolatry; on the other, the tenacity and wiles of the Indians defending their cherished *ololiuhqui*. The Indians appear to have won out. Today in almost all the villages of Oaxaca one finds the seeds still serving the natives as an ever present help in time of trouble.

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### *Tlilitzen* — *Ipomoea violacea* L.\*

Since the appearance of the Schultes paper in 1941, and apart from the chemical findings of Dr. Hofmann, there has been only one important contribution to our knowledge of the morning glory seeds. In 1960 Don Tomás MacDougall published his discovery that in various parts of Oaxaca, especially in the Zapotec area, another seed is used exactly as *ololiuhqui* is.<sup>24</sup> This is the seed of a second morning glory, *Ipomoea violacea* L. In Zapotec *ololiuhqui* is known currently as *badoh*; the second seed is *badoh negro* or *badungás*, the full Zapotec equivalent of *badoh negro*. The black seeds are long and somewhat angular. In Nahuatl they could hardly be called *ololiuhqui*, since this term means the 'round things' or 'pellets'.

The Nahuatl must have known them: what then did they call them? We believe the answer is to be found in Pedro Ponce's *Breve Relación de los Dioses y Ritos de la Gentilidad*, Par. 46, where he speaks of *ololiuhqui*, *peyote*, and *tlilitzin*, all with the same magic properties. The third, possibly a hapax in the corpus of surviving classic Nahuatl documentation, is clearly not *ololiuhqui*, since both are mentioned in the same sentence as distinct products. The word comes from the Nahuatl root meaning 'black', with a reverential suffix. May we not assume that this was the name current in classic Nahuatl for the black seeds that Don Tomás found in wide use among the Zapotecs in the 1950's? Apparently there is a further reference to *badoh negro* in the records of the Inquisition: a Negro slave who was also a *curandero* used the term *ololiuhqui del moreno*, which Dr. Aguirre Beltrán thinks was his way of saying 'black *ololiuhqui*'. But since this Negro was obviously a stranger both to Nahuatl and to Spanish, little can be deduced from his terminology.<sup>25</sup>

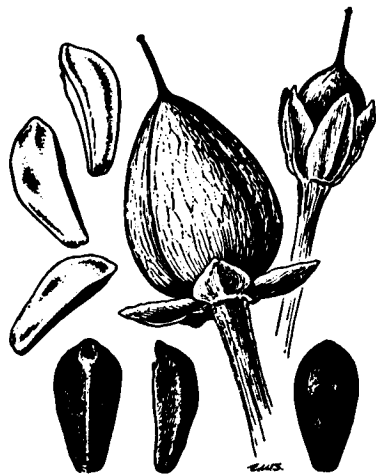
According to Don Tomás, in San Bartolo Yautepec, a village of the Sierra Costera, only the black seed is used, but in many villages

#### Note by R. E. Schultes:

\*Taxonomically, the genus *Ipomoea* is extremely difficult. The binomial *Ipomoea tricolor* has already crept into the limited literature that has grown up in connection with this second kind of *ololiuhqui*. Inasmuch as some confusion may result in the use of two names—*Ipomoea tricolor* and *I. violacea*—we should point out that, after a study of plant material and the taxonomic history of these binomials, I am in agreement with the American specialist in the *Convolvulaceae*, H. D. House (House, H. D.: "The North American species of the genus *Ipomoea*" in *Ann. N.Y. Acad. Sci.* 18 [1908] 259), that both names actually refer to one polymorphic species. In this case, then, the older name is *Ipomoea violacea* L. Sp. Pl. (1753) 161, which should be used in preference to its synonym *I. tricolor* Cav. Ic. Pl. Rar. 3 (1794) 5, t. 208.

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both kinds are known. The black is widely regarded as the more potent. In some places the black seed is called *macho*, 'male', and the men take it; the *Rivea* seed, known as *hembra*, 'female', is for the women. The dose is often seven or a multiple thereof—seven, or 14, or 21; or the seeds are measured in the cup of the hand; or, as one informant in the Sierra Mazateca told me, one takes a beer-cap full of *Rivea* seed.



Capsule and seed of *Ipomoea violacea*, enlarged two and one half times.

In recent years a number of experimenters have taken the *Rivea* seeds with no effects, and this has led one of them to suggest that the reputation of *ololihqui* is due wholly to auto-suggestion.<sup>26</sup> These negative results may be explained by inadequate preparation. The Indians grind the seeds on the *metate* (grinding stone) until they are reduced to flour. Then the flour is soaked in cold water, and after a short time the liquor is passed through a cloth strainer and drunk. If taken whole, the seeds give no result, or even if they are cracked. They must be ground to flour and then the flour soaked briefly in water. Perhaps those who took the seeds without results did not grind them, or did not grind them fine enough, and did not soak the resulting flour. The chemistry of the seeds seems not to vary from region to region, and seeds grown in the Antilles and in Europe are as potent as those grown in Oaxaca. I have taken the black seeds twice in my home in New York, and their potency is undeniable.

## PLATE II

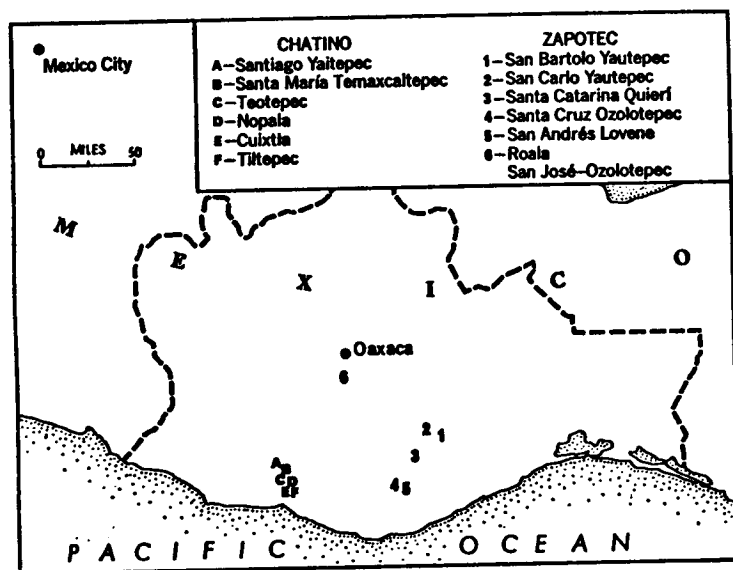


Photo by Wasson

*Ipomoea violacea*

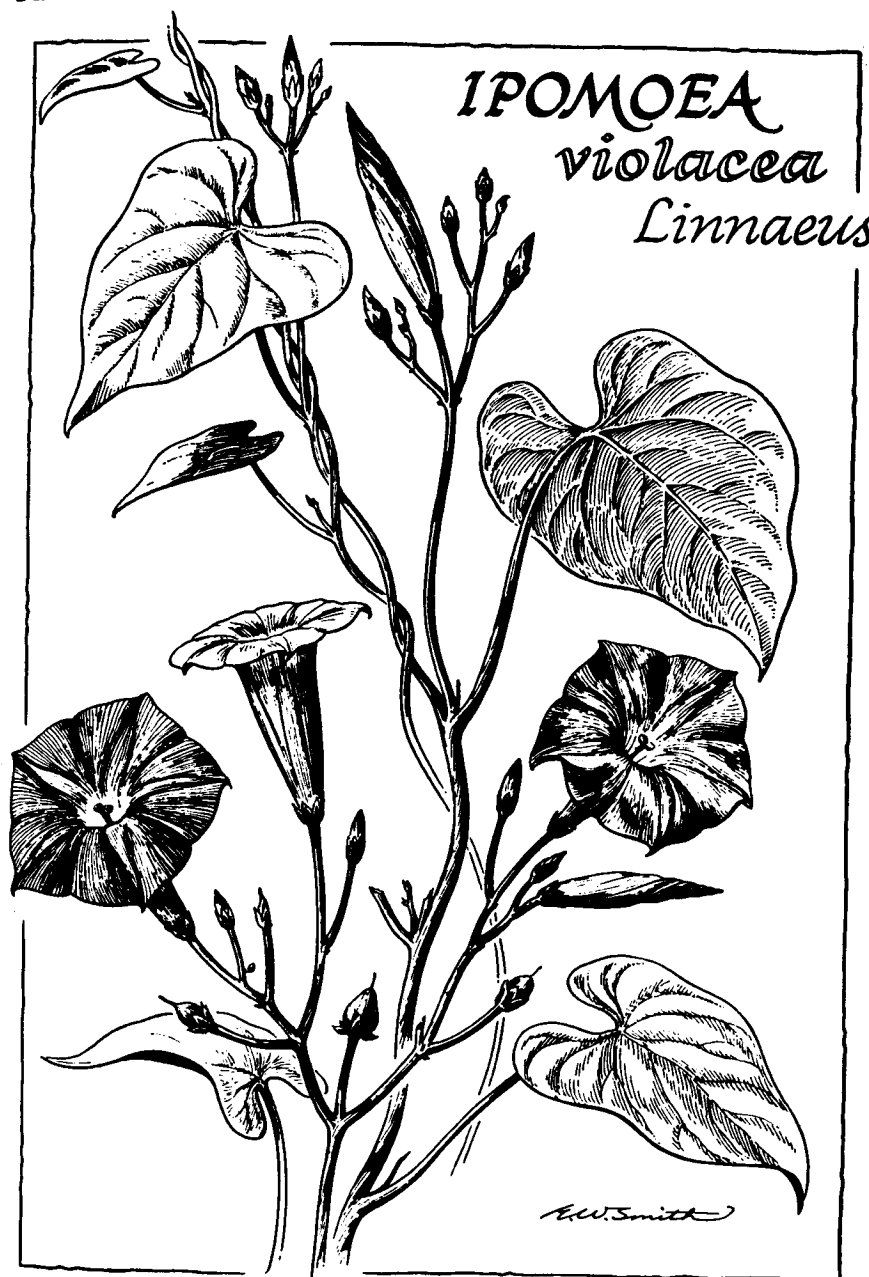
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Don Tomás MacDougall and his colleague Francisco Ortega of Tehuantepec, both old and excellent friends of Ing. Weitlaner, have given us permission to use their notes and photographs for this article. We publish for the first time a map showing the villages in Oaxaca where they have found the *Ipomoea* seeds in use, a group of seven Zapotec villages visited by Don Tomás, and also six villages in the Chatino country visited at my express request by 'Chico' Ortega in 1962, since we had a suspicion that the black seed was used in that linguistic area.<sup>27</sup> The area of diffusion is certainly far wider than these villages, but this is a start.



The black seeds are called variously in the Zapotec country: *badoh negro* seems to be the prevalent name. But in the Zapotec dialect spoken in San Bartolo Yautepec they are called *la'aja shnash*, 'seed of the Virgin'. In this town Francisco Jiménez ('Chico Bartolo') took a series of photographs in the course of a routine vigil. A relative of his, Paula Jiménez, is a *curandera*, and she officiated, and also dictated an account of the steps taken in the rite. We give a paraphrase of what she said.

## PLATE III



Drawn approximately one-half natural size.

Drawn by ELMER W. SMITH

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First, the person who is to take the seeds must solemnly commit himself to take them, and to go out and cut the branches with the seed. There must also be a vow to the Virgin in favor of the sick person, so that the seed will take effect with him. If there is no such vow, there will be no effect. The sick person must seek out a child of seven or eight years, a little girl if the patient is a man, a little boy if the patient is a woman. The child should be freshly bathed and in clean clothes, all fresh and clean. The seed is then measured out, the amount that fills the cup of the hand, or about a thimbleful. The time should be Friday, but at night, about eight or nine o'clock, and there must be no noise, no noise at all. As for grinding the seed, in the beginning you say, 'In the name of God and of the Virgencita, be gracious and grant the remedy, and tell us, Virgencita, what is wrong with the patient. Our hopes are in thee.' To strain the ground seed, you should use a clean cloth—a new cloth, if possible. When giving the drink to the patient, you must say three Pater Nosters and three Ave Marias. A child must carry the bowl in his hands, along with a censer. After having drunk the liquor, the patient lies down. The bowl with the censer is placed underneath, at the head of the bed. The child must remain with the other person, waiting to take care of the patient and to hear what he will say. If there is improvement, then the patient does not get up; he remains in bed. If there is no improvement, the patient gets up and lies down again in front of the altar. He stays there a while, and then rises and goes to bed again, and he should not talk until the next day. And so everything is revealed. You are told whether the trouble is an act of malice or whether it is illness.

The photographs illustrate the *curandera's* account of a ceremony invoking the divine power of the morning glory seeds. A feature of this recital is the child who serves the beverage. He (or she) is ritually cleansed, a symbol of purity. I encountered this practice for the first time in 1960, in the Mixteca, in the Valley of Juxtlahuaca, when Robert Ravicz and I were looking for survivals of the mushroom cult. The mushrooms were to be gathered by a virgin, they were ground on the *metate* by a virgin.<sup>28</sup> In 1962, in Ayautla and also in San José Tenango, in the Sierra Mazateca, again a maiden ground the leaves of the *Salvia divinorum*. Here then is a general pattern, whether in the Sierra Mazateca, or among the Mixtecs of the Valley of Juxtlahuaca, or among the Zapotecs of San Bartolo Yautepec, for the preparation of the divinatory agent, either the seeds of the morning glory or the mushrooms or the *hojas de la Pastora*. (Had we been warned in advance to look for this, perhaps we should have discovered the same custom in other regions visited in

## PLATE IV



(Left) Paula Jiménez, *curandera* of San Bartolo Yautepec, making infusion of *Ipomoea violacea* seeds. 1959.  
(Center) Child serving the infusion to patient, with incense burner. (Right) Patient taking infusion of *I. violacea* seeds, to be enlightened as to the cause and cure of his malady.  
Photos by CHICO BARTOLO

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years previous to 1960.) Suddenly it dawns on us that a deep-seated harmony exists between the role of the child in preparing the divine agent and the names circulating throughout the Nahuatl area for the sacred mushrooms themselves: we have found them called *los niños*, 'the children', and *los hombrecitos y las mujercitas*, 'the little men and the little women', and *los señoritos*, 'the lordlings'. Marina Rosas, *curandera* of San Pedro Nexapa, on the slopes of Popocatepetl, called the sacred mushrooms in Nahuatl *apipiltzin*, 'the noble princes of the waters', a singularly appropriate name, in which the prefix 'a' conveys the sense of 'water'. And here we revert to the miraculous plant that we think is the *Salvia divinorum*, called (as we believe) in Nahuatl *pipiltzintzintli*, in the records of the Inquisition dating from 1700. This is obviously related to the name for the sacred mushrooms used by Marina Rosas. Dr. Aguirre Beltrán translates it as 'the most noble Prince' and relates it to *Piltzintli*, the young god of the tender corn. In the accounts of the visions that the Indians see after they consume the sacred food—whether seeds or mushrooms or plant—there frequently figure *hombrecitos*, 'little men', *mujercitas*, 'little women', *duendes*, 'supernatural dwarfs'. Beginning with our maiden at her *metate*, here is a fascinating complex of associations that calls for further study and elaboration. For example, are these Noble Children related perchance to the Holy Child of Atocha, which gained an astonishing place in the hearts of the Indians of Middle America? Did they seize on this Catholic image and make it a charismatic icon because it expressed for them, in the new Christian religion, a theme that was already familiar to them in their own supernatural beliefs?

The tradition of the *doncella* at the *metate* is of venerable age. Jacinto de la Serna, writing his *Manual para Ministros* toward the middle of the 17th Century, said in his Chap. XV:3 about *ololiuhqui* and *peyotl*:

como para algunas medicinas es menester molerlo, dicen que para que haga éste efecto à de ser molido *por mano de doncella*.

Nor is this citation unique. An Indian afflicted in his nether limbs was told to take *pipiltzintzintli*:<sup>29</sup>

que la había de beber *molida por una doncella*, desleída en agua tibia, en ayunas, habiendo confesado y comulgado antes de tomarla y ayunado viernes y sábado y el día siguiente beberlo en el nombre de la Santísima Trinidad y de la Virgen de Guadalupe y de San Cayetano . . . y que el aposento había de estar muy abrigado, sin luz, ni aire,

## PLATE V



(Top) Young girl grinding sacred mushrooms (*Psilocybe mexicana* Heim) in Juxtla'naca, Oaxaca, in Mixteca). 1960. (Bottom) Young girl grinding *Salvia divinorum* leaves, Ayautla, Sierra Mazateca. Sept. 1962.

Photos by WASSON

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ni ruido, y que no se habia de dormir, sino estar en silencio aguardando a ver dichas figuras (un viejecito vestido de blanco y unos muchachos pequeñitos vestidos del mismo color) que ellas lo untarian y desengañarian si tenía remedio su mal o no.

What an extraordinary recapitulation of the salient features of the divinatory ritual as practiced in Middle America! There is the interweaving of Christian elements and pagan. There is the maiden grinding the divine element, and the preparation of the suppliant, confessing and communicating before he consults the Mediator. There is the sheltered spot—protected from sound and light. There is the consultation on an empty stomach. There is the clear intimation as to what one sees: a little old man clothed in white and little boys garbed in the same. Finally there is the august pronouncement whether the affliction of the suppliant can or cannot be remedied. All these features are always present, regardless of the divinatory plant that is consulted.

Perhaps there is testimony far older than the colonial records of the Inquisition. In the collection of Hans Namuth of New York is a 'mushroom stone' of extraordinary features.<sup>30</sup> The cap of the mushroom carries the grooved ring that, according to Stephan F. de Borhegyi, is the hallmark of the early pre-Classic period, perhaps 1000 B.C. The stone comes from the Highlands of Guatemala. Out of the stipe there leans forward a strong, eager, sensitive face, bending over an inclined plane. It was not until we had seen the *doncella* leaning over a *metate* and grinding the sacred mushrooms in Juxtahuaca in 1960, that the explanation of the Namuth artifact came to us. The inclined plane in front of the leaning human figure must be a *metate*. It follows that the face must be that of a woman. Dr. Borhegyi and I went to see the artifact once more: it was a woman! A young woman, for her breasts were only budding, a *doncella*. How exciting it is to make such a discovery as this: a theme that we find in the contemporary Mixteca, and in the Sierra Mazateca, and in the Zapotec country, is precisely the same as we find recorded in Jacinto de la Serna and in the records of the Santo Oficio. Again it is precisely the same (if our interpretation of the silent witness in the New York studio of Mr. Namuth be correct) as in a stone carving that dates back perhaps 2,500 years!

## PLATE VI



Two views of mushroom stone in Namuth collection; early pre-classic, B.C. 1000-500. The figure emerging from stipe is believed to be that of a young woman before *metate* or grinding stone. Note her breasts.

Photos by HANS NAMUTH

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### NOTES

#### Abbreviations:

AGN: Archivo General de la Nación, ramo Inquisición.

AB: Gonzalo Aguirre Beltrán: *Medicina y Magia*, 1955, México.

[Later edition, Instituto Nacional Indigenista, 1963.]

(A thoughtful monograph with numerous quotations from AGN, indispensable for every student of its subject.)

1. *Vide, e.g.*, AGN, vol. 340, folios 354-359.
2. The Caribs were also called Canibs or Calibs. From 'Canib' the English-speaking world derived 'cannibal', which it prefers to 'anthropophage'. Shakespeare in his *Tempest* took his foul monster Caliban from the 'Calibs'.
3. There is a well known sentence in Sahagún, Bk. X, Chap. XXIX, 2, that is usually read as follows: 'Hay otra hierba como tunas de tierra que se llama peyotl . . .' According to Professor Charles E. Dibble, the Florentine Codex, folios 129v-130r, reads thus: 'Ay otra yerva, como turmas de tierra, que se llama peyotl . . .' *Turmas* is a Spanish word of ancient lineage and obviously makes sense. *Vide* Joan Corominas: *Diccionario Crítico Etimológico de la Lengua Castellana*, entry *turmas*.
4. AB, Chap. 7, Area Cultural y Foco de Difusión.
5. a) Lewis Lewin: *Über Anhalonium Lewinii*, Arch. für experim. Path. und Pharma., 24:401: 1888. This article also appeared in translation in the same year in the *Therapeutic Gazette*, London. In these initial articles there was a misunderstanding about which species of cactus *peyotl* was.  
b) Havelock Ellis: 'A Note on Mescal Intoxication.' *The Lancet*, No. 3849, June 5, 1897.  
c) S. Weir Mitchell: 'Note upon the Effects of Anhalonium lewinii.' *Brit. Med. Journal*, Dec. 5, 1896.  
After their initial papers these three authors continued writing on the subject in books and articles. Lewin in his 1888 paper did not report on human experiences with *peyotl*: the first such report appeared in *The Therapeutic Gazette*, on Sept. 16, 1895: 'Anhalonium Lewinii (Mescal Buttons). A study of the drug, with especial reference to its physiological action upon man, with report of experiments', by D. W. Prentiss and Francis P. Morgan.
6. Now published as one volume by Harper, in paperback (Colophon series) and hardcover.
7. *Vide* Weston La Barre: 'Twenty years of peyote studies', *Current Anthropology*, Vol. 1, No. 1, Jan. 1960. To be included in a second reprinting of La Barre's *The Peyote Cult* (originally Yale Univ. Publications, No. 19) by Shoe String Press, Hamden, Conn., August, 1964, with an added chapter bringing the research up to date.
8. AB, Chap. 7, Etimología.

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9. *Vide* V. P. Wasson and R. G. Wasson: *Mushrooms, Russia and History*, Pantheon Books, N.Y., 1957, pp. 311, 313, and 315.
10. 'Teo' means 'god' in Nahuatl; no Nahuatl word is more richly documented than this. The resemblance to the Latin and Greek word for 'god' is one of those fortuitous convergences of sound and meaning that occur in language studies. Given the multiplicity of languages in the world and the limited number of sounds that the human voice can utter, they are inevitable. 'Nacatl' means 'flesh', and 'nanacatl' is used for mushroom, a plural form of the word for 'flesh'. This interpretation of the word was accepted from the beginning: three early colonial sources take it for granted. No modern Nahuatl scholar disputes it.
11. 'Identification of the Teonanacatl, or "Sacred Mushroom" of the Aztecs, with the narcotic cactus, *Lophophora*, and an account of its ceremonial use in ancient and modern times', an address delivered May 4, 1915, before the Botanical Society of Washington. Published as an 'An Aztec Narcotic (*Lophophora Williamsii*)' in *Journal of Heredity*, Vol. 6, July 1915.
12. For Reko references, *vide* my bibliography on the hallucinogenic mushrooms published in the Botanical Museum Leaflets, Harvard Univ., Sept. 7, 1962, Vol. 20, No. 2, Entries 144-147. Second edition, with corrections and addenda, March 10, 1963, No. 2a.
13. 'The Elements of Mazatec Witchcraft', Gothenburg Ethnographical Museum. *Ethnographical Studies* 9, 1939, pp. 119-149. Also 'Some Notes on the Mazatec'. Lecture before Sociedad Mexicana de Antropología, Mexico, Aug. 4, 1938, published by Editorial Cultura, 1939. In both papers Johnson speaks of the Mazatec practice of consuming an infusion of a plant known as *hierba María* for divination purposes. This is surely the plant that we have called *hojas de María*, 'leaves of the Virgin Mary', and that has lately been named *Salvia divinorum* Epling & Játiva: we suppose it is the *pipiltzintzintli* of Colonial Nahuatl. Incidentally Ing. Weitlaner discovered a Mazatec informant in the Chinantla who gave him the most extensive testimony about this plant that we had had until it was identified in 1962. See 'Curaciones Mazatecas', AINAH, Vol. IV, No. 32, 1949-50.
14. *Vide* Harvard Botanical Museum Leaflets, Feb. 21, 1939, Vol. 7, No. 3, p. 38 fnt.
15. *Vide* Roger Heim and R. Gordon Wasson: *Les Champignons hallucinogènes du Mexique*, Archives du Muséum National d'Histoire Naturelle, Series 7, Vol. VI, p. 184.
16. *Vide* above, Note 8. Also 'Seeking the Magic Mushroom', *Life*, May 13, 1957; International Edition, June 10; 'En Busca de los Hongos Mágicos', *Life en Español*, June 3. Also 'I Ate the Sacred Mushroom', by Valentina P. Wasson, *This Week*, May 19, 1957.
17. *Vide* Harvard Botanical Museum Leaflets, Sept. 7, 1962, Vol. 20, No. 2: also second edition, with corrections and addenda, March 10, 1963, No. 2a.



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18. Sahagún: X:24:27. Juan de Cárdenas: De los problemas y secretos maravillosos de las Indias, Mexico, 1591, folio 243v. Also AB: Chap. 5, Note 9, and Chap. 7, Note 97.
19. AB: Chap. 5, *Pipiltzintzintli*.
20. Harvard Botanical Museum Leaflets, Dec. 28, 1962. Vol. 20, No. 3. Carl Epling and Carlos D. Játiva-M.: 'A New Species of *Salvia* from Mexico.'
21. V. P. Wasson and R. Gordon Wasson: *Mushrooms, Russia and History*. pp. 324-6; also Plate LIV. Also Roger Heim and R. Gordon Wasson, *Les Champignons Hallucinogènes du Mexique*, Chap. III, Fig. 15 bis.
22. 'The Psychotropic Active Principles of *Ololiuhqui*, an Ancient Aztec Narcotic', lecture delivered at the IUPAC Symposium on 'The Chemistry of Natural Products', in Melbourne, August 18, 1960.
23. 'A Contribution to our Knowledge of *Rivea corymbosa*, the narcotic ololiuhqui of the Aztecs', published by Botanical Museum of Harvard University, Cambridge, Mass., 1941.
24. Thomas MacDougall: '*Ipomoea tricolor*: A Hallucinogenic Plant of the Zapotecs', published in *Boletín del Centro de Investigaciones Antropológicas de México*, No. 6, March 1, 1960.
25. AB: Chap. 6, El Complejo del Ololiuhqui, Para 7. The author did not know of the use of *Ipomoea* seeds when he published his book; in fact, he associated ololiuhqui with the *Solanaceae* rather than the *Convolvulaceae*. He explained the blackness of the seeds as an attribute caused by age.
26. For example, V. J. Kinross-Wright: 'Research on Ololiuhqui: The Aztec Drug.' *Neuro-Psychopharmacology*. Vol. 1, Proc. 1st Intern. Congr. of Neuro-Pharmacology, Rome, Sept. 1958, pp. 453-56. Also 'Das Mexikanische Rauschgift Ololiuhqui,' by Blas Pablo Reko. *El México Antiguo*, Vol. III, Nos. 3/4, Dec. 1934, pp. 1-7; especially p. 6. But for a powerful reaction see Humphry Osmond: 'Ololiuhqui: the Ancient Aztec Narcotic,' published in *Jour. of Mental Science*, Vol. 101, No. 424, July 1955.
27. *Vide* R. Gordon Wasson: 'The hallucinogenic fungi of Mexico: An inquiry into the origins of the religious idea among primitive peoples.' Harvard Botanical Museum Leaflets, Vol. 19, No. 7, Feb. 1961, pp. 152-3, *fn*., last sentence.

Chico's visit to the Chatino country served a dual purpose. In *Beyond Telepathy* (Doubleday, N.Y., 1962) Andrija Puharich on p. 20 had written, 'The author was also informed by certain *brujos* among the Chatino Indians (living in Southern Oaxaca) that they used the *Amanita muscaria* for hallucinogenic purposes. The proper dose is one-half of a mushroom.' If true, this would be sensational. It is not true. *A. muscaria* is the hallucinogenic mushroom of the Siberian tribesmen in their rites. It is not used in Mexico.

When we first began visiting the Indian country of southern Mexico, we were expecting to find that the hallucinogenic mushroom there was *A.*

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*muscaria*. For ten years we combed the various regions and we have invariably found that it played no role in the life of the Indians, though of course it is of common occurrence in the woods. We had visited the Chatino country, where we were accompanied by Bill Upson of the Instituto Lingüístico de Verano, who speaks Chatino. Later he likewise helped Puharich, but he informs us that no *brujo* in his presence testified to the use of a mushroom answering to the description of *A. muscaria*. After the Puharich statement had appeared, I gave Bill a photograph in color of *A. muscaria*, and he returned to Juquila and Yaitepec. An informant named Benigno recognized the mushroom at once and identified the stage of development that it had reached, as would be expected of a countryman intimately familiar with his environment. He said the people in his area do not take that kind of mushroom. Chico Ortega is a Zapotec Indian of mature years, keen intelligence, high sense of responsibility, and vast experience throughout the villages of the State of Oaxaca. In the summer of 1962 I sent him, with the color photo, to sound out Chatino villagers as to the use they made of it. Discreetly, he went from village to village. The results were uniformly and unanimously negative.

Puharich in *The Magic Mushroom* as well as in his most recent book is unduly impressed with the occurrence of *A. muscaria*. Wherever the species of trees occur with which it lives in mycorrhizal relationship, it is common. It is one of the commonest of fungi in North America and Eurasia. Puharich quotes at length as an authority Victor Reko, a notorious *farceur*, not to be confused with his cousin, Blas Pablo Reko. Puharich does not identify the spot where he met his *brujos*, though it seems probable that he did not get beyond the mestizo town of Juquila. He does not explain how he put his question to them, how he explained over a double linguistic barrier what *A. Muscaria* looked like. He does not explain what precautions he took to avoid a leading question that would almost certainly produce his desired answer.

28. *Vide* Robert Ravicz: 'La Mixteca en el Estudio Comparativo del Hongo Alucinante.' *AINAH*, Vol. XIII, 1960 (1961), pp. 73-92; see pp. 79, 80, 86.
29. AB: 'La Familia de los Solanos,' *fn*., 45.
30. It is important to note that the nine miniature mushroom stones found at Kaminaljuyu, Guatemala, and reported by Borhegyi, 1961, figure 1, were found in a sealed cache together with nine miniature legless *metates* accompanied by *manos*. The fact that the *metates* were found together in association with the mushroom stones indicates the possibility that they were used together in ceremonials, probably for crushing or grinding mushrooms or ololiuhqui seeds.

(Stephan F. de Borhegyi: 'Miniature Mushroom Stones from Guatemala', *Amer. Antiquity*, Vol. 26, No. 4, pp. 498-504, April 1961.)

# The Active Principles of the Seeds of *Rivea Corymbosa* and *Ipomoea Violacea*

ALBERT HOFMANN

## *Background of the Present Investigations*

THE preceding article by R. Gordon Wasson described the history and ethnobotanical aspect of *ololiuhqui* and emphasized the significant position that this drug occupies in relation to the other Mexican divinatory agents. The following account will consider the chemical investigations that led to the isolation of the active principles of this old Aztec magic drug and to the elucidation of its chemical structure.

The road that led to the discovery of the active principles of *ololiuhqui* is both remarkable and significant. It is, therefore, excusable to preface the chemical report with a short account of the background and results of these investigations.

It all started exactly 20 years ago, when I was engaged in the synthesis of lysergic acid derivatives in the pharmaceutical-chemical research laboratory of Sandoz Ltd. in Basel, Switzerland.

Lysergic acid is the foundation stone of the ergot alkaloids, the active principles of the fungus-product *ergot*. Botanically speaking, ergot is the sclerotia of the filamentous fungus *Claviceps purpurea* which grows on grasses, especially rye. The ears of rye that have been attacked by the fungus develop into long, dark pegs to form ergot. The chemical and pharmacological investigation of the ergot alkaloids has been a main field of research of the natural products department of the Sandoz laboratories since the discovery of ergotamine by A. Stoll in 1918. These investigations have resulted in a

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variety of useful pharmaceuticals which find wide application in obstetrics, in internal medicine, in neurology and psychiatry.

On the 16th of April 1943, upon recrystallizing *d*-lysergic acid diethylamide tartrate, which I had produced from natural lysergic acid and diethylamine by way of the lysergic acid hydrazide and azide, I suddenly became strangely inebriated. The external world became changed as in a dream. Objects appeared to gain in relief; they assumed unusual dimensions; and colors became more glowing. Even self-perception and the sense of time were changed. When the eyes were closed, colored pictures flashed past in a quickly changing kaleidoscope. After a few hours, the not unpleasant inebriation, which had been experienced whilst I was fully conscious, disappeared. What had caused this condition? Subsequent systematic self-experimentation with the chemicals that I had used on that day were to provide the answer. Lysergic acid diethylamide was tested, amongst other substances, as it was possible that a drop had fallen on my fingers and had been absorbed by the skin. I commenced my experiments on this compound by taking 0.5 ml of a 0.5 per mille aqueous solution, corresponding to 0.25 mg of *d*-lysergic acid diethylamide tartrate. This extremely small quantity proved to be a substantial overdose. A state of inebriation followed, lasting for a number of hours and filled with dramatic experiences, which have been described in former publications.<sup>1 2</sup> This is how the most active psychotomimetic, hallucinogenic compound known up to the present was discovered, a compound which subsequently attained great importance under the name of LSD 25 (Delysid<sup>®</sup>) in experimental psychiatry and, recently, in psychotherapy as well.

Lysergic acid diethylamide (formula I) was produced during the course of large-scale investigations on semi-synthetic amides of lysergic acid, after *d*-lysergic acid L-propanolamide-(2) (formula II), which was found to be identical with the natural alkaloid ergometrine (also known as ergonovine), had been synthesized. This was the first synthesis of a natural ergot alkaloid.<sup>3</sup> After the discovery of the psychotomimetic activity of LSD, a great number of further simple lysergic acid amides were synthesized in our laboratories<sup>4</sup> so as to ascertain the relationship between chemical structure and psychic activity in this group of compounds. The unsubstituted *d*-lysergic acid amide (=ergine) (formula III) and the *d*-isolysergic acid amide (=isoergine) (formula IV), were amongst these semi-synthetic analogues of LSD. Ergine, isoergine and ergometrine

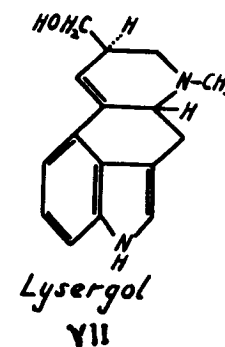
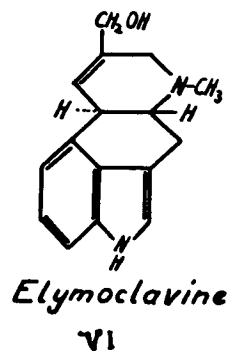
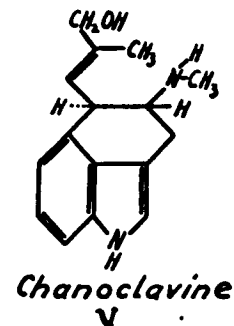
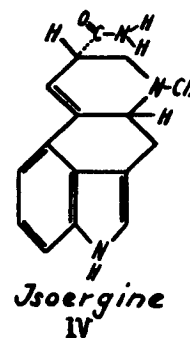
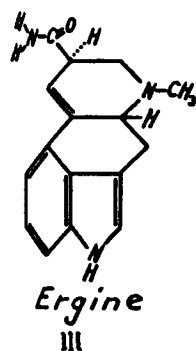
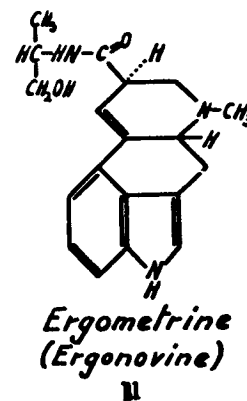
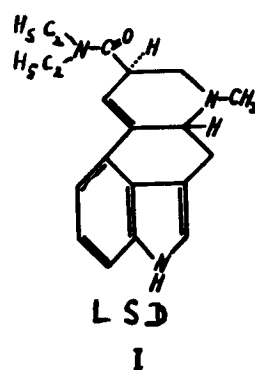
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were later found to be active principles of ololiuhqui, as will be shown below.

The discovery of LSD and subsequent research in the field of psychotomimetics caused the Mexican fungi to be brought to our laboratories. The preceding article told the history of the discovery of these fungi and the contribution to it by engineer Robert J. Weitlaner and his daughter Irmgard Weitlaner-Johnson, the work of Reko and of Schultes, as well as their rediscovery by the husband and wife team of Valentina P. and R. Gordon Wasson in collaboration with the mycologist Professor Roger Heim. After chemical analysis in a Paris laboratory had proved unsuccessful, Professor Heim sent a few of the hallucinogenic fungi to us in Basel on the assumption that the necessary conditions for a successful chemical investigation would be present in the laboratory in which LSD was discovered. During the course of chemical studies on "teonanácatl", psilocybin and psilocin were discovered as active principles of the most important hallucinogenic fungi.<sup>5</sup> Thus it was that the present investigations were crowned with success within an unusually short time, since these two active principles are indole compounds that are structurally related to LSD and ergot alkaloids. In the chain of events that led to the ololiuhqui problem, the most important factor was that the writer came into personal contact with Wasson as a result of investigations into the active principles of "teonanácatl".

Fired by the discussions with this outstanding expert on the Mexican magic drugs and encouraged by our successes with the hallucinogenic fungi, we decided to tackle the chemical investigation of the third most important Mexican psychotomimetic after "peyotl" and "teonanácatl"—namely "ololiuhqui". With the help of Wasson, we obtained authentic "ololiuhqui", as he sent us two samples from his expedition in Mexico in the late summer of 1959. With the samples, he wrote from Mexico City on August 6, 1959, the following: ". . . I am sending you . . . a small parcel of seeds that I take to be *Rivea corymbosa*, otherwise known as 'ololiuhqui', well known narcotic of the Aztecs, called in Huautla 'la semilla de la Virgen'. This parcel, you will find, consists of two little bottles, which represent two deliveries of seeds made to us in Huautla, and a larger batch of seeds, delivered to us by Francisco Ortega (Chico), the Zapotec guide, who himself gathered the seeds from the plants at the Zapotec town of San Bartolo Yautepec . . ." The first-mentioned light brown, roundish seeds (see Plate IX, top left) from Huautla (21 g), upon botanical investigation, were found to be

## PLATE VII



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*Rivea corymbosa* (L). Hall.f., whilst the black and angular seeds (see Plate IX, bottom left) were found to represent *Ipomoea violacea* L. (204 g).

The first small samples were sufficient for a number of chemical-analytical experiments, which showed the presence of indole compounds. This interesting result induced us to order greater quantities of these two seeds from Wasson. This second, large contingent of seeds (12 kg of seeds of *Rivea corymbosa* and 14 kg of *Ipomoea violacea*) was obtained with the aid of the Weitlaners, about whom Wasson gave the following information to the writer in a letter of 10th December 1959: "Robert Weitlaner is an Austrian, a naturalized Mexican citizen . . . He is a field Anthropologist and likes being in the field much better than lecturing to the students in the Instituto Nacional de Antropología e Historia, where he has a post. He is past 70 already, but still goes out for months at a time with almost no luggage, living in the villages. Irmgard is his daughter, the native-textile expert of the Museo Nacional . . ." These *Rivea* seeds obtained with the aid of the Weitlaners were gathered in the vicinity of Ocozacoatlá (Chiapas), the *Ipomoea* seeds in the Zapotec region by Thomas MacDougall and Francisco Ortega.

In 1960, MacDougall published his important discovery that, especially in the region of the Zapotecs, the seeds of a second twining species, which he found to be *Ipomoea violacea*, were used in conjunction with or instead of *ololiuhqui*.<sup>6</sup>

By using the large quantities of seeds of *Rivea corymbosa* and *Ipomoea violacea*, which we received in the early part of 1960 in the manner already described, we were able to isolate the main active principles and identify these chemically during the course of the summer. This isolation and identification will be reported in detail below. In a number of ways, the results of these investigations were surprising. The active principles of the Mexican morning glory drugs proved to be ergot alkaloids. The two main components were, in the case of both seeds, *d*-lysergic acid amide (ergine) and *d*-isolysergic acid amide (isoergine), whilst four additional alkaloids were present. The former are closely related to *d*-lysergic acid diethylamide (LSD), which we had, as has already been mentioned, produced synthetically and investigated many years before. From the phytochemical point of view, this finding was unexpected and of particular interest, because lysergic acid alkaloids, which had hitherto

## *Rivea Corymbosa and Ipomoea Violacea*

been found only in the lower fungi in the genus *Claviceps*, were now, for the first time, indicated for the higher plants, in the phanerogamic family *Convolvulaceae*.

The isolation of lysergic acid amides from *ololiuhqui* closed what is in reality a most strangely coincidental circle of research.

It was with the discovery of lysergic acid diethylamide (LSD) as a highly active psychotomimetic agent, during investigations on simple lysergic acid amides, that our research in the field of hallucinogenic compounds commenced. It was within the framework of this activity that the sacred Mexican fungi came to our laboratories. It was during the course of these investigations that I made personal contact with Wasson. And it was as a result of this contact that the investigations of *ololiuhqui* were conducted. In this sacred drug, lysergic acid amides, which made their appearance in the initial stages of our psychotomimetic research, were again found as active principles.

### *Former investigations on ololiuhqui*

In the classical study of the *ololiuhqui* problem by R. E. Schultes, published in 1941<sup>7</sup> (in which the historical, ethnographical and taxonomical aspects are treated in an excellent manner), there is discussed the only chemical investigation that had been done on the active principles of the seeds of *Rivea corymbosa* before the studies carried out by us. It was carried out by the pharmacologist, C. G. Santesson, in Stockholm in 1937.<sup>8</sup> He was, however, unsuccessful in isolating defined, crystallized compounds. Certain reactions seemed to suggest the presence of gluco-alkaloids.

Following Schultes' work, only two original publications have appeared that deal with the psychic action of *ololiuhqui* seeds on volunteers. In 1955, a Canadian psychiatrist, H. Osmond, conducted a series of experiments on himself. After taking 60 to 100 *Rivea* seeds, he passed into a state of apathy and listlessness accompanied by increased visual sensitivity. After about four hours, there followed a period in which he had a relaxed feeling of well-being, a feeling that lasted for some time.<sup>9</sup> In contrast to this result, V. J. Kinross-Wright in 1958 published the results of experiments performed on eight male volunteers who had taken doses of up to 125 seeds administered without any ascertainable effect in a single case.<sup>10</sup>

PLATE VIII



*Ipomoea violacea*



*Rivea corymbosa*

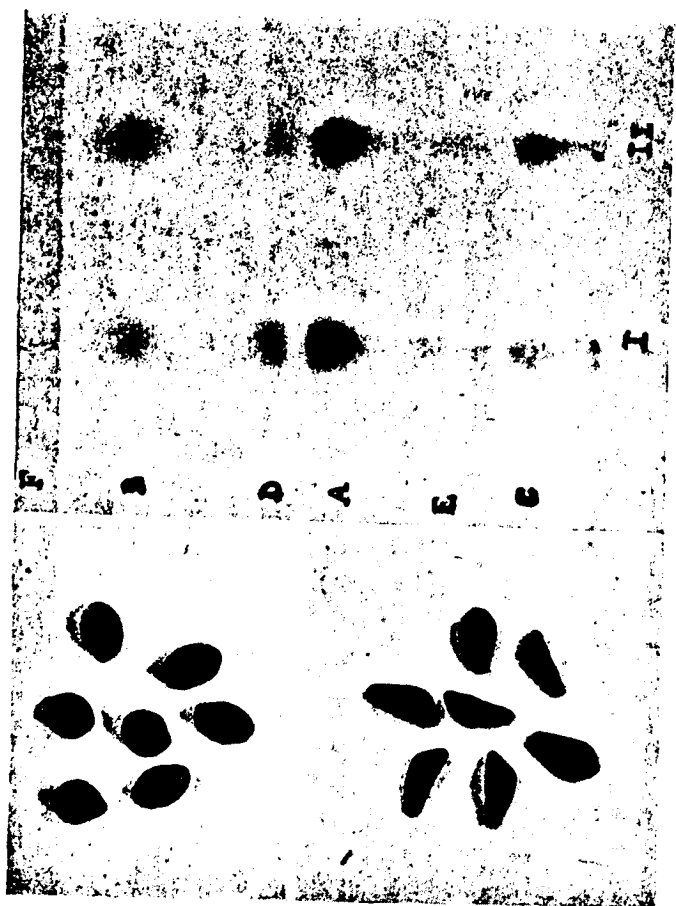
*Rivea Corymbosa and Ipomoea Violacea*

*Isolation and chemical identification of the active alkaloidal principles*

Plate IX shows the seeds of *Rivea corymbosa* (L.) Hall. f. and of *Ipomoea violacea* L., the origin of which has been given above and which were used for the chemical investigations now described. Plate VIII shows plants in bloom that were cultivated from these seeds.

We started our extraction studies with *Rivea corymbosa*. Since we knew nothing of the chemical nature and sensitivity of the active principles, only neutral solvents were used and all extracts were evaporated carefully at low temperature. The finely powdered seeds were defatted with methanol, and the evaporated methanol extracts were defatted with petroleum ether. The defatted residue was tested for various kinds of alkaloids, especially for indolic compounds, since the indole structure was known to occur in psychotomimetic agents. Indeed, when paper chromatograms of this *Rivea* extract were developed by spraying with a benzene solution of p-dimethyl-amino benzaldehyde and subsequently treated with hydrochloric acid gas, violet-blue spots appeared, indicating the presence of indolic compounds. In order to assess whether this indole fraction actually represented the active principle, we collected some milligrams of this fraction from a great number of paper chromatograms, and my laboratory assistant H. Tschertter and I tested it on ourselves. After my experience with LSD, I have become cautious: we started by taking doses as small as 0.1 mg, gradually increasing the dosage. With 2 mg of this crude indole fraction we got clear-cut psychic effects: a dream-like state resulted with drowsiness and alterations in the perception of objects and colors. This showed that the indole fraction of the *Rivea* extract contained the psychic active principles.

The paper chromatographical testing of the extract of *Ipomoea violacea* showed that here, too, the same or a similar indole compound was present. An even better separation than by the paper chromatogram was attained by thin layer chromatography. In Plate IX, right, the chromatograms of the extracts of *Rivea corymbosa* and *Ipomoea violacea*, which were obtained on plates with aluminum oxide layer, using chloroform containing 5% of methanol as the moving phase, are shown side by side. The indole compounds were made visible by spraying with a 5% solution of p-dimethyl-amino benzaldehyde in concentrated hydrochloric acid and treating with the fumes of aqua regia.



(Seeds of *Rivea corymbosa* (top, left) and *Ipomoea violacea* (bottom, left)  
 Seeds of *Rivea corymbosa* (top, left) and *Ipomoea violacea* (bottom, left).  
 (Right) Thin layer chromatogram of the alkaloidal fraction, each 25  $\mu$ g of *Rivea*  
*corymbosa* (I) and *Ipomoea violacea* (II).

### *Rivea Corymbosa and Ipomoea Violacea*

When larger quantities of seeds of *Rivea corymbosa* and *Ipomoea violacea* were available, the indole compounds could be obtained in preparative quantities. It was found that they were alkaloidal in nature and that they could be isolated by the usual methods used for the extraction and purification of alkaloids. For this purpose, the finely ground seeds were made alkaline with sodium bicarbonate, then extracted with ethyl acetate. The alkaloids were then removed from the extracts, which had been concentrated to a small volume in vacuum, with aqueous tartaric acid from which they were again shaken with ethyl acetate after making the mixture alkaline with a sodium bicarbonate solution. From the alkaloid fractions thus obtained, the individual components visible in the thin layer chromatogram could be separated by fractional crystallization, chromatography on aluminum oxide columns and thin layer plates with aluminum oxide and silica gel layers, on a preparative scale. The separated compounds were obtained in crystalline form and could be identified chemically. For further details, the reader is referred to our chemical publications.<sup>11 12 13 14</sup> Only the results of the chemical investigations can be summarized briefly within the scope of this article. These are given in Table I.

The fact that *Ipomoea violacea* contains a greater total of active principles than does *Rivea corymbosa* explains why the Indians used smaller quantities of badoh negro (*Ipomoea*) than of badoh (*Rivea*).

Identification of the individual indole bases showed that ergot alkaloids were present. The main component of the alkaloid mixture in the *Rivea* and *Ipomoea* seeds, which corresponds to spot A, is *d*-lysergic acid amide (ergine) (formula III), a compound that was first obtained as a cleavage product upon alkaline hydrolysis of ergot alkaloids<sup>15</sup> and then also by partial synthesis from lysergic acid and recently as a genuine alkaloid from the ergot of *Paspalum* grass.<sup>16</sup> The alkaloid corresponding to spot B in the chromatogram was found to be identical with *d*-isolysergic acid amide (isoergine) (formula IV) which, as in the case of ergine, was already known as the hydrolysis product of ergot alkaloids<sup>17</sup> and as a natural alkaloid. The third alkaloid, chanoclavine (formula V), which forms spot C in the chromatogram, had been discovered by us in ergot of the tropical millet cob *Pennisetum typhoides*.<sup>18</sup> Elymooclavine (formula VI), contained in spot D, was first isolated from the ergot of the wild grass *Elymus mollis*.<sup>19</sup>

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TABLE I

Alkaloids of *Rivea corymbosa* and *Ipomoea violacea* seeds.

Thin layer chromatogram (Plate IX, right)		<i>Rivea corymbosa</i> (ololihqui, badoh)	<i>Ipomoea violacea</i> (badoh negro)
A	<i>d</i> -Lysergic acid amide (ergine)	0.0065 %	0.035 %
B	<i>d</i> -Isolysergic acid amide (isoergine)	0.0020 %	0.005 %
C	Chanoclavine	0.0005 %	0.005 %
D	Elymoclavine	0.0005 %	0.005 %
	Lysergol	0.0005 %	—
	Ergometrine	—	0.005 %
Total alkaloid content (colorimetrically determined calculated on a mol. weight of 300)		0.012 %	0.06 %

Ergometrine (formula II), the alkaloid which is mainly responsible for the uterotonic hemostatic action of the ergot drug, could only recently be identified as one of the active principles of *Ipomoea violacea*.<sup>20</sup> Together with elymoclavine, it forms spot D in the thin layer chromatogram (Plate IX, right). The seeds of *Rivea corymbosa* either do not contain this compound or else only traces thereof. Instead, we found lysergol (formula VII) in the last mentioned seed, an alkaloid absent from the seeds of *Ipomoea violacea*. Lysergol was produced synthetically<sup>21</sup> in our laboratories (as were *d*-lysergic acid amide, *d*-isolysergic acid amide and ergometrine) before it was discovered as one of the active principles of a Mexican magic drug. The compounds corresponding to spots E and F are present in such small quantities that they have hitherto not been identified.

In Plate VII, the structural formulas of the six alkaloids now isolated from ololihqui and badoh negro are depicted. These formulas clearly show the close relationship between ololihqui's active principles and the most active hallucinogenic agent known thus far, the synthetically produced LSD (formula I).

As has already been pointed out, the discovery of ergot alkaloids in the higher plants is a most unexpected phytochemical discovery. In view of the uniqueness of these findings, other investi-

## *Rivea Corymbosa and Ipomoea Violacea*

gators found it necessary to ascertain whether these alkaloids were actually produced by plant tissue or whether they were produced by fungi or bacteria present in the seeds. Before publishing our results, we examined our seed samples for attack by fungus and found that they were healthy and had not been infected. Furthermore, we had detected the alkaloids in fresh leaves, stalks and roots of *Ipomoea violacea* and, to a very small extent also, in the leaves of *Rivea corymbosa*.<sup>20</sup> These were results that showed that ergot alkaloids were in fact produced by tissues of *Rivea corymbosa* and *Ipomoea violacea* and not by fungi infecting the seeds.

Our results were confirmed by the detailed investigations of W. A. Taber and R. A. Heacock who ascertained that the alkaloids are concentrated in the embryo of the seeds and are absent from the shells that had occasionally been attacked by fungi.<sup>22</sup> The occurrence of small quantities of alkaloids in the leaves and stems of *Rivea corymbosa* was also confirmed.<sup>23</sup> W. A. Taber, L. C. Vining and R. A. Heacock then also investigated the seeds of a number of commercially available varieties of Morning Glory (*Ipomoea* and *Convolvulus* spp.) and were able to trace the presence of alkaloids in a number of these ornamental plants.<sup>24</sup> The quantitative determination and the identification of clavine and lysergic acid alkaloids, however, were done only colorimetrically or by means of paper and thin layer chromatography. In no instance were the individual alkaloids isolated and crystallized by the authors.

### *Pharmacological and clinical activity of the isolated alkaloids*

There is no doubt that the alkaloids isolated from the seeds of *Rivea corymbosa* and *Ipomoea violacea* are the active principles of these magic plants. Aside from the described alkaloids, a large quantity of a new glucoside, which was named turbicoryn by M. C. Pérezamador and J. Herrán, was isolated from the seeds of *Rivea corymbosa*.<sup>25</sup> <sup>26</sup> It is most improbable that the presence of this glucoside has anything to do with the psychotomimetic action of ololihqui as, according to our observations, the seeds of *Ipomoea violacea*, which are stronger than the *Rivea* seeds, contain none of this glucoside or only small traces of it. On the other hand, the high pharmacological and psychic activity of the lysergic acid amides, as well as of elymoclavine and lysergol, is certain.



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*D*-lysergic acid amide (designation of compound undergoing tests: LA 111) was tested pharmacologically and clinically during the course of investigations on *d*-lysergic acid diethylamide (LSD 25) and related compounds long before it was known to be a component of ololiuhqui. Already at that stage we had ascertained in experiments on ourselves, a psychotomimetic activity with a marked narcotic component with dosages of 0.5 to 1 mg. The following paragraph is taken from a hitherto unpublished record of the first experiment which the writer performed upon himself with LA 111 on 30.10.1947.

- 10.00 h: Intramuscular injection of 0.5 ml of 1 per mille solution of LA 111 (=0.5 mg *d*-lysergic acid amide).  
11.00 h: Tiredness in the neck, slight nausea.  
11:05 h: Tired, dreamy, incapable of clear thoughts. Very sensitive to noises which give an unpleasant sensation.  
11.10 h: Desire to lie down and sleep. Genuine physical and mental tiredness, which is not experienced as an unpleasant sensation. Slept for 3 hours.  
15.00 h: Return of normal condition with full capacity for performing work.

This action of *d*-lysergic acid amide was later confirmed by the comparative systematic investigation of H. Solms.<sup>27 28</sup> He describes the action as follows: LA 111 induces indifference, a decrease in psychomotor activity, the feeling of sinking into nothingness and a desire to sleep . . . until finally an increased clouding of consciousness does produce sleep.

Clinical investigations have been initiated with *d*-isolysergic acid amide, but no results are available yet. Upon taking 2 mg of isoergine himself, the writer experienced tiredness, apathy, a feeling of mental emptiness and of the unreality and complete meaninglessness of the outside world.

Elymoclavine and lysergol elicit an excitation syndrome in various animals that is caused by a central stimulation of the sympathetic.<sup>29</sup> The results of clinical testing are not, as yet, available.

Psychotomimetic effects are unknown for ergometrine, which is used to a large extent in obstetrics as a uterotonic and hemostatic agent. When using the small dosages which are administered for this purpose, the alkaloid apparently has no action on the psychic functions. Its occurrence in the alkaloid mixture of *Ipomoea violacea* can thus have no significant effect on the action of badoh negro. Furthermore, chanoclavine, which has no outstanding pharm-

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acological activity, appears to play no part in the occurrence of the psychic effects of badoh and badoh negro.

According to the results of experiments performed thus far with pure alkaloids, it appears as though *d*-lysergic acid amide, elymoclavine and lysergol and possibly also *d*-isolysergic acid amide are mainly responsible for the psychic effect of ololiuhqui.

Systematic comparative investigations are presently being performed with the pure alkaloidal principles of ololiuhqui and total extracts from the seeds so as to ascertain the psychic effect on humans. These will show whether the alkaloids described are alone responsible for the psychotomimetic effects (which, in view of our present knowledge, seems probable) or whether other factors play a part.

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## A Uterine Stimulant Effect of Extracts of Morning Glory Seeds \*

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The history, description and use of seeds of certain members of the Convolvulaceae for divinatory purposes has been well documented in the literature by Schultes and Wasson.<sup>1 2</sup> These reports have prompted several investigations, and recently Hofmann *et al.*<sup>3 4 5</sup> have isolated and identified the active principles as certain ergot-type alkaloids. These are *d*-lysergic acid amide (ergine), *d*-isolysergic acid amide (isoergine), chanoclavine, elymoclavine and ergometrine. Further work by Taber *et al.*<sup>6 7 8</sup> has established that the alkaloids are in the microbially sterile embryo. They have also reported that the leaf and stem, but not the root, of *Rivea corymbosa* also contained small amounts of alkaloids and that these principles are present in many varieties of morning glories. However, some of the seeds are listed only by horticultural name, and some are synonymous with others in his table of plants studied.

Our investigations<sup>9</sup> indicate that the main psychotomimetic principles are limited to varieties or horticultural forms of *Ipomoea violacea* L. This would seem to make sense because, of the many different species of *Ipomoea* available to the Mexican natives in their local flora, only *Ipomoea violacea* L. is used in their religious ceremonies for divinatory purposes.

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The following is a list of morning glories we have studied botanically and chemically:

Botanical Name	Horticultural Name	Flower Color	Shows presence of indole alkaloids by thin layer chromatographic analysis as compared to authentic <i>Ipomoea violacea</i> and <i>Rivea corymbosa</i> seeds obtained from Mexico.
<i>Ipomoea violacea</i>	'Heavenly Blue'	Blue	Positive
" "	'Pearly Gates'	White	Positive
" "	'Flying Saucers'	Blue-white variegated	Positive
" "	'Wedding Bells'	Lavender	Positive
" "	'Summer Skies'	Light Blue	Positive
" "	'Blue Star'	Light Blue with dark blue midrib spears	Positive
<i>Ipomoea Nil</i>	'Scarlett O'Hara'	Red	Negative
" "	'Candy Pink'	Pink	Negative
<i>Ipomoea Nil</i> (From India)	—	Blue to violet	Negative
<i>Ipomoea muricata</i> (From India)	—	Blue to violet	Negative
<i>Ipomoea X Sloteri</i>	'Cardinal Climber'	Red	Negative
<i>Ipomoea hederacea</i>	—	Red	Negative
<i>Ipomoea lindheimeri</i>	—	Violet	Negative
<i>Ipomoea turpethum</i>	—	—	Negative
<i>Ipomoea maxima</i>	—	—	Negative

Gröger, who is presently studying the biogenesis of ergoline derivatives in *Ipomoea*<sup>10 11</sup> has also reported the occurrence of these indole alkaloids in *Ipomoea* species.<sup>12</sup> He has stated that, for the first time, ergoline derivatives have been isolated from *Ipomoea rubro-caerulea* Hook. We believe that this species name is synonymous with *Ipomoea violacea* L. and that the plants may be identical. The name is listed as a synonym under *Ipomoea violacea* by House and Wasson.<sup>9</sup> However, Gröger reported the presence of agroclavine and elymoclavine in *Ipomoea coccinea*, the first case of the presence of these ergot type alkaloids in this species.

The presence of ergonovine<sup>†</sup> in *Ipomoea* species has been reported by Taber,<sup>7</sup> Gröger,<sup>12</sup> and Hofmann.<sup>13</sup> Taber has detected it in 'Pearly Gates' and *Rivea corymbosa*, while Hofmann found it only in *Ipomoea violacea*.

<sup>†</sup>"Ergonovine" is synonymous with "ergometrine", Hofmann's designation.

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Shortly after the publication of these reports in the scientific literature, there arose in the United States a chewing-craze for morning glory seeds ('Heavenly Blue,' 'Pearly Gates,' 'Flying Saucers') for purposes of eliciting hallucinatory responses similar to LSD. Many articles followed in lay journals in the wake of these practices, further extending their usage. Many seed companies even reported depletion of their stocks of morning glory seeds.

In view of these developments and the fact that these readily available seeds contain ergonovine in quantities of around 0.005%,<sup>13</sup> we became interested in testing the most popular varieties ('Heavenly Blue' and 'Pearly Gates') for possible oxytocic properties.

Tests by Savage *et al.*<sup>14</sup> have shown that low doses (20 to 50 seeds of 'Heavenly Blue' and 'Pearly Gates') are capable of inducing "beginning imagery" and that higher doses (100 to 500 seeds) show distinct LSD-like effects. They produce spatial distortions and visual and auditory hallucinations as well as other effects characteristic of LSD.

A theoretical calculation based on the approximate weight of 4 grams per 100 seeds and a 0.005% figure for the amount of ergonovine in the seeds gives the following results:

Number of Seeds	Approximate amount of Ergonovine in milligrams (theoretical)
20	0.04
50	0.10
100	0.20
500	1.0

Although we have found that the Mexican *Ipomoea violacea* seeds (seeds which Hofmann reports his 0.005% figure for ergonovine) weigh slightly more than half their horticultural forms per 100 seeds, the above figures, even at half-value, fall well into the human dosage range for ergonovine. This range is 0.2 to 0.5 mg of ergonovine as an oxytocic.<sup>15</sup>

Since the isolated rat uterus has been used for the bioassay of ergonovine, we decided to use this tissue for our tests. The uterus was prepared in the following manner:

Female rats were killed by a blow to the head and the uterus rapidly removed. One horn was used per experiment, and about 14 horns were used throughout the experiments. To obtain isotonic recordings a uterine horn was mounted vertically in a standard tissue bath (70 ml).

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Aerated de Jalon's solution<sup>16</sup> at 37.5°C was used to obtain a quiescent tissue. The movements of the uterus were recorded on a slow moving kymograph. After running the smoked drum to obtain a control tracing, the aqueous extracts were added.

Preliminary experiments with crude aqueous extracts of ground seeds proved inconclusive because of the coating effect of the mucilaginous preparation on the isolated uterus. A slight oxytocic effect was detected, but it was not notable. It was then decided that a crude total extract of the indole alkaloids from the seeds be used. This was prepared by Gröger's method<sup>12</sup> and involves the following steps:

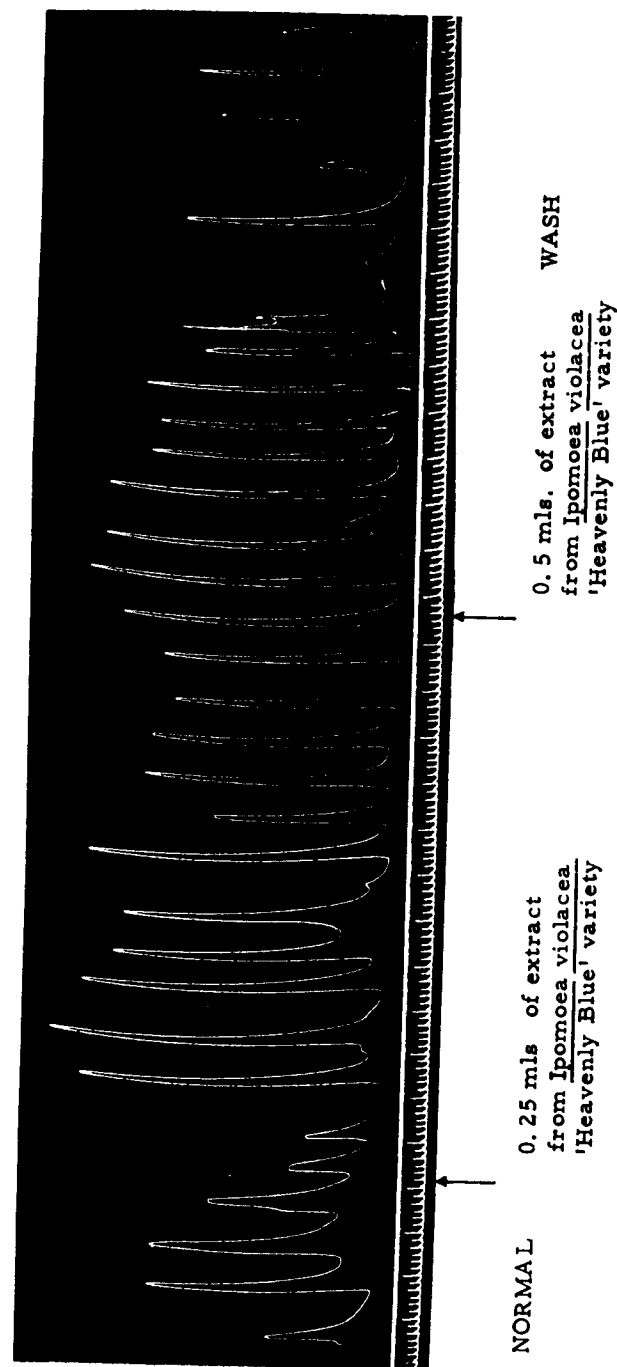
The ground seeds\* were defatted with petroleum ether. This was followed by extraction with an acetone-tartaric acid solution. The acetone was evaporated off on a water bath, and the resultant tartaric acid solution was neutralized. This was finally extracted with methylene chloride to obtain the alkaloids. This was evaporated *in vacuo* and the extract taken up in 2 ml of water; aliquots were taken and added to the bath during normal rhythmic contractions. Several aqueous dilutions of each extract were used in the experiments. It was found that a 0.25 ml aliquot of the original 2 ml was capable of eliciting a maximal contractive response. This was approximately equivalent to a response effected by 0.1 ml of a 1 ml solution containing 0.2 mg of Ergonovine maleate (Ergonovine maleate, 0.2 mg/1 ml, ampoule, Lilly Co., Inc., Indianapolis, Indiana). After a few minutes, an additional 0.5 ml was added and a return to maximal contractions observed. This procedure was repeated with an extract of 'Badoh negro' (Mexican *Ipomoea violacea* seeds), 'Heavenly Blue' and 'Pearly Gates' (blue and white flowered varieties of *Ipomoea violacea*, respectively).

The results of one of these experiments with the 'Heavenly Blue' variety is shown in Fig. 1. Similar responses were seen in the case of all of these seeds.

A spectrophotometric chemical analysis by the Michelson and Kelleher<sup>17</sup> modification of the Van Urk's assay was used to analyze the extracts. The 0.25 ml of the original 2 ml total extract which was used in the pharmacological tests, represents the following

\*1 gram of seeds was used in each case.

FIGURE 1.  
THE UTERINE STIMULANT EFFECT OF AN EXTRACT OF IPOMOEA VIOLACEA L.  
SEEDS (MORNING GLORY 'HEAVENLY BLUE' VARIETY) ON ISOLATED RAT UTERUS



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assayed amounts of total alkaloids calculated as ergonovine maleate:

<u>Name</u>	<u>Total alkaloids in 0.25 mls</u>	<u>% Total alkaloids in 1 gm of seeds</u>
'Badoh negro'	0.05 mg	0.040%*
'Heavenly Blue'	0.025 mg	0.024%
'Pearly Gates'	0.029 mg	0.024%

Since certain ergot-type alkaloids found in *Ipomoea* seeds are known to be oxytocic, due in part to their uterine-stimulant action, the authors suggest that a potential danger exists if excessive amounts are ingested. In addition, Savage<sup>14</sup> has mentioned in his studies on humans the possibility of ergot poisoning with high doses of *Ipomoea* seeds.

\*Hofmann reports 0.06% total with his collection of 'Badoh negro' (*Ipomoea violacea*) seeds. Our experience has shown that this total percentage varies from seed batch to seed batch. In addition, the thoroughness of extraction by various methods also varies.

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# The Religious Experience: Its Production and Interpretation \*

TIMOTHY LEARY

THREE YEARS AGO, on a sunny afternoon in the garden of a Cuernavaca villa, I ate seven of the so-called "sacred mushrooms" which had been given to me by a scientist from the University of Mexico. During the next five hours, I was whirled through an experience which could be described in many extravagant metaphors but which was above all and without question the deepest religious experience of my life.

Statements about personal reactions, however passionate, are always relative to the speaker's history and may have little general significance. Next come the questions "Why?" and "So what?"

There are many predisposing factors—intellectual, emotional, spiritual, social—which cause one person to be ready for a dramatic mind-opening experience and which lead another to shrink back from new levels of awareness. The discovery that the human brain possesses an infinity of potentialities and can operate at unexpected space-time dimensions left me feeling exhilarated, awed, and quite convinced that I had awakened from a long ontological sleep.

A profound transcendent experience should leave in its wake a changed man and a changed life. Since my illumination of August, 1960, I have devoted most of my energies to try to understand the revelatory potentialities of the human nervous system and to make these insights available to others.

I have repeated this biochemical and (to me) sacramental ritual over fifty times personally and, almost every time, I have been awed

[\*Lecture delivered at a meeting of Lutheran psychologists and other interested professionals, sponsored by the Board of Theological Education, Lutheran Church in America, in conjunction with the 71st Annual Convention of the American Psychological Association, Philadelphia, Bellevue Stratford Hotel, August 30, 1963.]

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by religious revelations as shattering as the first experience. During this period I have been lucky enough to collaborate in this work with more than 50 scientists and scholars who joined our various research projects. We have arranged transcendent experiences for over one thousand persons from all walks of life, including 69 full-time religious professionals, about half of whom profess the Christian or Jewish faith and about half of whom belong to Eastern religions.]

Included in this roster are two college deans, a divinity college president, three university chaplains, an executive of a religious foundation, a prominent religious editor, and several distinguished religious philosophers. In our research files and in certain denominational offices there is building up a large and quite remarkable collection of reports which will be published when the political atmosphere becomes more tolerant. At this point it is conservative to state that over 75 percent of these subjects report intense mystico-religious responses, and considerably more than half claim that they have had the deepest spiritual experience of their life.<sup>3</sup>

The interest generated by this research led to the formation of an informal group of ministers, theologians and religious psychologists who have been meeting once a month (summers excepted) for over two years, with an average of 20 persons in attendance. In addition to arranging for spiritually oriented psychedelic sessions and discussing prepared papers, this group provided the supervisory manpower for the dramatic "Good Friday" study, and was the original planning nucleus of the organization which assumed sponsorship of our research in consciousness-expansion: IF-IF (the International Federation for Internal Freedom). The generating impulse and the original leadership of IFIF came from a seminar in religious experience, and this fact may be related to the alarm which IFIF aroused in some secular and psychiatric circles.

THE "GOOD FRIDAY" STUDY, which has been sensationalized recently in the press as "The Miracle of Marsh Chapel", deserves further elaboration not only as an example of a serious, controlled experiment, involving over 30 courageous volunteers, but also as a systematic demonstration of the religious aspects of the psychedelic revelatory experience. This study was the Ph.D.-dissertation research of a graduate student in the philosophy of religion at Harvard University, who is, incidentally, both an M.D. and a Bachelor of Divinity. This investigator set out to determine whether the transcendent experience reported during psychedelic sessions was similar

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to the mystical experience reported by saints and famous religious mystics.

The subjects in this study were 20 divinity students selected from a group of volunteers. The subjects were divided into five groups of four persons, and each group met before the session for orientation and preparation. To each group were assigned two guides with considerable psychedelic experience. The ten guides were professors and advanced graduate students from Boston-area colleges.

The experiment took place in a small, private chapel, beginning about one hour before noon on Good Friday. The Dean of the Chapel, who was to conduct a three-hour devotional service upstairs in the main hall of the church, visited the subjects a few minutes before the start of the service at noon, and gave a brief inspirational talk.

Two of the subjects in each group and one of the two guides were given a moderately stiff dosage (i.e., 30 mg) of psilocybin, the chemical synthesis of the active ingredient in the "sacred mushroom" of Mexico. The remaining two subjects and the second guide received a placebo which produced noticeable somatic side effects, but which was not psychedelic. The study was triple-blind: neither the subjects, guides, nor experimenter knew who received psilocybin.

Because the dissertation describing this study has not yet been published,<sup>1</sup> any detailed discussion of the results would be premature and unfair to the investigator. I can say, however, that the results clearly support the hypothesis that, with adequate preparation and in an environment which is supportive and religiously meaningful, subjects report mystical experiences significantly more than placebo controls.

Our studies, naturalistic and experimental, thus demonstrate that if the expectation, preparation, and setting are spiritual, an intense mystical or revelatory experience can be expected in from 40 to 90 percent of subjects ingesting psychedelic drugs. These results *may be* attributed to the bias of our research group, which has taken the "far-out" and rather dangerous position that there are experiential-spiritual as well as secular-behavioral potentialities of the nervous system. While we share and follow the epistemology of scientific psychology (objective records), our basic ontological assumptions are closer to Jung than to Freud, closer to the mystics than to the theologians, closer to Einstein and Bohr than to Newton.

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In order to check on this bias, let us cast a comparative glance at the work of other research groups in this field who begin from more conventional ontological bases.

Oscar Janiger, a psychiatrist, and William McGlothlin, a psychologist, have reported the reactions of 194 psychedelic subjects. Seventy-three of these took LSD as part of a psychotherapy program, and 121 were volunteers. The religious "set" would not be expected to dominate the expectations of these subjects. The results, which are abstracted from a paper published in *The Psychedelic Review*,<sup>2</sup> are as follows:

ITEM	PERCENT Janiger-McGlothlin (non-religious setting) N = 194
Increased interest in morals, ethics . . . :	35
Increased interest in other universal concepts (meaning of life) :	48
Change in sense of values	48
LSD should be used for	
becoming aware of oneself:	75
getting new meaning to life:	58
getting people to understand each other:	42
An experience of lasting benefit:	58

Two other studies, one by Ditman *et al.*, another by Savage *et al.*, used the same questionnaire, allowing for inter-experiment comparison. Both Ditman and Savage are psychiatrists, but the clinical environment of the latter's study is definitely more religious (subjects are shown religious articles during the session, etc.). Summarizing the religious items of their questionnaires:

ITEM	Ditman (supportive environment) N = 74	PERCENT Savage (supportive environment & some religious stimuli) N = 96
Feel it [LSD] was the greatest thing that ever happened to me:	49	85
A religious experience . . . :	32	83
A greater awareness of God or a Higher Power, or an Ultimate Reality:	40	90

Here, then, we have five scientific studies by qualified investigators—the four naturalistic studies by Leary *et al.*,<sup>3</sup> Savage *et al.*,<sup>4</sup>



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Ditman *et al.*,<sup>5</sup> and Janiger-McGlothlin,<sup>6</sup> and the triple-blind study in the Harvard dissertation mentioned earlier—yielding data which indicate that (1) if the setting is supportive but not spiritual, between 40 to 75 percent of psychedelic subjects will report intense and life-changing religious experiences; and that (2) if the set and setting are supportive and spiritual, then from 40 to 90 percent of the experiences will be revelatory and mystico-religious.

It is hard to see how these results can be disregarded by those who are concerned with spiritual growth and religious development. These data are even more interesting because the experiments took place during an historical era when mysticism, individual religious ecstasy (as opposed to religious religious behavior), was highly suspect, and when the classic, direct, non-verbal means of revelation and consciousness-expansion such as meditation, yoga, fasting, monastic withdrawal and sacramental foods and drugs were surrounded by an aura of fear, clandestine secrecy, active social sanction, and even imprisonment.<sup>7</sup> The 69 professional workers in religious vocations who partook of psychedelic substances (noted earlier), were responsible, respected, thoughtful, and moral individuals who were grimly aware of the controversial nature of the procedure and aware that their reputations and their jobs might be undermined (and, as a matter of fact, have been and are today being threatened for some of them). *Still* the results read: 75% spiritual revelation. It may well be that the most intense religious experience, like the finest metal, requires fire, the heat of external bureaucratic opposition, to produce the keenest edge. When the day comes—as it surely will—that sacramental biochemicals like LSD will be as routinely and tamely used as organ music and incense to assist in the attainment of religious experience, it may well be that the ego-shattering effect of the drug will be diminished. Such may be one aspect of the paradoxical nature of religious experience.



THE RELIGIOUS EXPERIENCE. You are undoubtedly wondering about the meaning of this phrase which has been used so freely in the preceding paragraphs. May I offer a definition?

*The religious experience is the ecstatic, incontrovertibly certain, subjective discovery of answers to four basic spiritual questions.* There can be, of course, absolute subjective certainty in regard to secular questions: "Is this the girl I love? Is Fidel Castro a wicked man? Are the Yankees the best baseball team?" But issues which do not involve the four basic questions belong to secular games, and

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such convictions and faiths, however deeply held, can be distinguished from the religious. Liturgical practices, rituals, dogmas, theological speculations, can be and too often are secular, i.e., completely divorced from the spiritual experience.

What are these four basic spiritual questions? There is the Ultimate-Power question, the Life question, the Human-Destiny question, and the Ego question.

### 1. **The Ultimate-Power Question:**

What is the Ultimate Power or Basic Energy which moves the universe, creates life? What is the Cosmic Plan?

### 2. **The Life Question:**

What is life, where did it start, where is it going?

### 3. **The Human-Destiny Question:**

What is man, whence did he come, and where is he going?

### 4. **The Ego Question:**

What am I? What is my place in the plan?

While one may disagree with the wording, I think most thoughtful people—philosophers or not—can agree on something like this list of basic issues. Do not most of the great religious statements—Eastern or monotheistic—speak directly to these four questions?

Now one important fact about these questions is that they are continually being answered and re-answered, not only by all the religions of the world but also by the data of the natural sciences. Read these questions again from the standpoint of the goals of (1) astronomy-physics, (2) biochemistry, (3) genetics, paleontology, and evolutionary theory, (4) neurology.

We are all aware of the unhappy fact that both science and religion are too often diverted towards secular game goals. Various pressures demand that laboratory and church forget these basic questions and instead provide distractions, illusory protection, narcotic comfort. Most of us dread confrontation with the answers to these basic questions, whether these answers come from science or religion. But if "pure" science and religion address themselves to the same basic questions, what is the distinction between the two disciplines? Science is the systematic attempt to record and measure the energy process and the sequence of energy transformations we call life. The goal is to answer the basic questions in terms of objective, observed, public data. Religion is the systematic attempt to provide answers to the same questions subjectively, in terms of direct, incontrovertible, personal experience.

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Science is a social system which evolves roles, rules, rituals, values, language, space-time locations to further the quest for these goals—these answers. Religion is a social system which has evolved its roles, rules, rituals, values, language, space-time locations to further the pursuit of the same goals—the revelatory experience. A science which fails to address itself to these spiritual goals, which accepts other purposes (however popular), becomes secular, political, and tends to oppose new data. A religion which fails to provide direct experiential answers to these spiritual questions becomes secular, political, and tends to oppose the individual revelatory confrontation. R. C. Zaehner,<sup>8</sup> whose formalism is not always matched by his tolerance, has remarked that “experience, when divorced from revelation, often leads to absurd and wholly irrational excesses.” Like any statement of polarity the opposite is equally true: revelation, when divorced from experience, often leads to absurd and wholly rational excesses. Those of us who have been researching the area of consciousness have been able to collect considerable sociological data about the tendency of the rational mind to spin out its own interpretations. But I shall have more to say about the political situation in a later section of this paper.



At this point I should like to present my main thesis. I am going to advance the hypothesis that *those aspects of the psychedelic experience which subjects report to be ineffable and ecstatically religious involve a direct awareness of the processes which physicists and biochemists and neurologists measure.*

We are treading here on very tricky ground. When we read the reports of LSD subjects, we are doubly limited. First, *they* can only speak in the vocabulary they know, and for the most part they do not possess the lexicon and training of energy scientists. Second, *we researchers* only find what we are prepared to look for, and too often we think in crude psychological-jargon concepts: moods, emotions, value judgments, diagnostic categories.

In recent months we have re-examined our data and have begun to interview subjects from the perspective of this present hypothesis. The results are interesting. To spell them out in brief detail I am going to review some of the current scientific answers to these four basic questions and then compare them with reports from psychedelic subjects.

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### (1) The Ultimate-Power Question:

A. *The scientific answers* to this question change constantly—Newtonian laws, quantum indeterminacy, atomic structure, nuclear structure. Today the *basic energy* is located within the nucleus. Inside the atom,

a transparent sphere of emptiness, thinly populated with electrons, the substance of the atom has shrunk to a core of unbelievable smallness: enlarged 1000 million times, an atom would be about the size of a football, but its nucleus would still be hardly visible—a mere speck of dust at the center. Yet that nucleus radiates a powerful electric field which holds and controls the electrons around it.<sup>9</sup>

Incredible power and complexity operating at speeds and spatial dimensions which our conceptual minds cannot register. Infinitely small, yet pulsating outward through enormous networks of electrical forces—atom, molecule, cell, planet, star: all forms dancing to the nuclear tune.

The *cosmic design* is this network of energy whirling through space-time. More than 15,000 million years ago the oldest known stars began to form. Whirling disks of gas molecules (driven of course by that tiny, spinning, nuclear force)—condensing clouds—further condensations—the tangled web of spinning magnetic fields clustering into stellar forms, and each stellar cluster hooked up in a magnetic dance with its planetary cluster and with every other star in the galaxy and each galaxy whirling in synchronized relationship to the other galaxies.

One thousand million galaxies. From 100 million to 100,000 million stars in a galaxy—that is to say, 100,000 million planetary systems per galaxy and each planetary system slowly wheeling through the stellar cycle that allows for a brief time the possibility of life as we know it.

Five thousand million years ago, a slow-spinning dwarf star we call the sun is the center of a field of swirling planetary material. The planet earth is created. In five thousand million years the sun's supply of hydrogen will be burned up, the planets will be engulfed by a final solar explosion. Then the ashen remnants of our planetary system will spin silently through the dark infinity of space. And then is the dance over? Hardly. Our tiny solar light, which is one of one hundred thousand million suns in our galaxy, will scarcely be missed. And our galaxy is one of a thousand million galaxies spinning out and up at rates which exceed the speed of light—each

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galaxy eventually burning up, to be replaced by new galaxies to preserve the dance equilibrium.

Here in the always changing data of nuclear physics and astronomy is the current scientific answer to the first basic question—material enough indeed for an awesome cosmology.

B. *Psychedelic reports* often contain phrases which seem to describe similar phenomena, subjectively experienced.

- (a) I passed in and out of a state several times where I was so relaxed that I felt open to a total flow, over and around and through my body (more than my body) . . . All objects were dripping, streaming, with white-hot light or electricity which flowed in the air. It was as though we were watching the world, just having come into being, cool off, its substance and form still molten and barely beginning to harden.
- (b) Body being destroyed after it became so heavy as to be unbearable. Mind wandering, ambulating throughout an ecstatically-lit indescribable landscape. How can there be so much light—layers and layers of light, light upon light, all is illumination.
- (c) I became more and more conscious of vibrations—of the vibrations in my body, the harp-strings giving forth their individual tones. Gradually I felt myself becoming one with the Cosmic Vibration. . . . In this dimension there were no forms, no deities or personalities—just bliss.
- (d) The dominant impression was that of entering into the very marrow of existence . . . . It was as if each of the billion atoms of experience which under normal circumstances are summarized and averaged into crude, indiscriminate wholesale impressions was now being seen and savored for itself. The other clear sense was that of cosmic relativity. Perhaps all experience never gets summarized in any inclusive overview. Perhaps all there is, is this everlasting congeries of an infinite number of discrete points of view, each summarizing the whole from its perspective.
- (e) I could see the whole history and evolution along which man has come. I was moving into the future and saw the old cycle of peace and war, good times and bad times, starting to repeat, and I said, "The same old thing again, oh God! It has changed though, it is different," and I thought of the rise of man from animal to spiritual being. But I was still moving into the future and I saw the whole planet destroyed and all history, evolution, and human efforts being wiped out in this one ultimate destructive act of God.

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Subjects speak of participating in and merging with pure (i.e., content-free) energy, white light; of witnessing the breakdown of macroscopic objects into vibratory patterns, visual nets, the collapse of external structure into wave patterns, the awareness that everything is a dance of particles, sensing the smallness and fragility of our system, visions of the void, of world-ending explosions, of the cyclical nature of creation and dissolution, etc. Now I need not apologize for the flimsy inadequacy of these words. We just don't have a better experiential vocabulary. If God were to permit you a brief voyage into the Divine Process, let you whirl for a second into the atomic nucleus or spin you out on a light-year trip through the galaxies, how on earth would you describe what you saw, when you got back, breathless, to your office? This metaphor may sound far-fetched and irrelevant, but just ask someone who has taken LSD in a supportive setting.

### (2) The Life Question:

#### A. *The Scientific Answer:*

Our planetary system began over five billion years ago and has around five billion years to go. Life as we know it dates back to about one billion years. In other words, the earth spun for about 80 percent of its existence without life. The crust slowly cooled and was eroded by incessant water flow. "Fertile mineral mud was deposited . . . now giving . . . for the first time . . . the possibility of harboring life." Thunderbolts in the mud produce amino acids, the basic building blocks of life. Then begins the ceaseless production of protein molecules, incalculable in number, forever combining into new forms. The variety of proteins "exceeds all the drops of water in all the oceans of the world." Then protoplasm. Cell. Within the cell, incredible beauty and order.

When we consider the teeming activity of a modern city it is difficult to realize that in the cells of our bodies infinitely more complicated processes are at work—ceaseless manufacture, acquisition of food, storage, communication and administration . . . . All this takes place in superb harmony, with the cooperation of all the participants of a living system, regulated down to the smallest detail.<sup>9</sup>

Life is the striving cycle of repetitious, reproductive energy transformations. Moving, twisting, devouring, changing, the unit of life is the cell. And the blueprint is the genetic code, the two nucleic

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acids—the long, intertwined, duplicating chains of DNA and the controlling regulation of RNA—“which determine the structure of the living substance.”

And where is it going? Exactly like the old Hindu myths of cyclical rotation, the astrophysicists tell us that life is a temporary sequence which occurs at a brief midpoint in the planetary cycle. Terrestrial life began around four billion years A.B. (“after the beginning” of our solar cycle) and will run for another two billion years or so. At that time the solar furnace will burn so hot that the minor planets (including Earth) will boil, bubble and burn out. In other planetary systems the time spans are different, but the cycle is probably the same.

There comes an intermediate stage in the temperature history of a planet which can nourish living forms, and then life merges into the final unifying fire. Data here, indeed, for an awesome cosmology.

B. *The psychedelic correlates* of these biological concepts sound like this: confrontation with and participation in cellular flow; visions of microscopic processes; strange, undulating, multi-colored, tissue patterns; being a one-celled organism floating down arterial waterways; being part of the fantastic artistry of internal factories; recoiling with fear at the incessant push, struggle, drive of the biological machinery, clicking, clicking, endlessly, endlessly—at every moment engulfing you. For example:

- (a) My eyes closed, the impressions became more intense. The colors were brilliant blues, purples, and greens with dashes of red and streaks of yellow-orange. There were no easily identifiable objects, only convolutions, prisms, and continuous movement.
- (b) My heart a lizard twitching lithely in my pocket, awaiting the wave again, my flesh sweating as it crawled over my bones, the mountains curved around my heart, the surf crashing against my mucoused lungs, coughing into heart beats, pulsing death to scare me. Futile body. Awaiting the undertow escaping under the wave which crashed so coughingly over my heart, blue lighted into YES. An undertow going UP . . . . The universe has an axis which is not perpendicular, and round it flock the living colors, pulsing eternal involutions.
- (c) I then gradually became aware of movement, a rocking type of movement, like on a roller-coaster, yet I did not move my body at all . . . . With an overwhelming acceleration I was turning around and around, swirling, then shuttling back and forth, like a piece of potassium on water, hissing, sparkling, full of life and fire.

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### (3) The Human-Destiny Question:

#### A. *The Scientific Answer:*

The flame of life which moves every living form, including the cell cluster you call *yourself*, began, we are told, as a tiny single-celled spark in the lower pre-Cambrian mud; then passed over in steady transformations to more complex forms. We like to speak of higher forms, but let's not ignore or patronize the single-cell game. It's still quite thriving, thank you. Next, your ancestral fire glowed in seaweed, algae, flagellate, sponge, coral (about one billion years ago); then fish, fern, scorpion, milliped (about 600 million years ago). Every cell in your body traces back (about 450 million years ago) to the same light-life flickering in amphibian (and what a fateful and questionable decision to leave the sea—should we have done it?). Then forms, multiplying in endless diversity—reptile, insect, bird—until, one million years ago, comes the aureole glory of *Australopithecus*.\*

The torch of life next passes on to the hand-axe culture (around 600,000 years ago) to *Pithecanthropus* (can you remember watching for the charge of Southern elephants and the sabre-tooth tiger?); then blazing brightly in the radiance of our great-grandfather Neanderthal man (a mere 70,000 years ago), suddenly flaring up in that cerebral explosion that doubled the cortex of our grandfather Cromagnon man (44,000 to 10,000 years ago), and then radiating into the full flame of recent man, our older Stone Age, Neolithic brothers, our Bronze and Iron Age selves.

What next? The race, far from being culminated, has just begun:

The development of Pre-hominines *Australopithecus* . . . to the first emergence of the . . . Cromagnons lasted about . . . fifteen thousand human life-spans . . . . In this relatively short period in world history the hominid type submitted to a positively hurricane change of form; indeed he may be looked upon as one of the animal groups whose potentialities of unfolding with the greatest intensity have been realized. It must, however, by no means be expected that this natural flood of development will dry up with *Homo sapiens recens*. Man will be unable to remain man as we know him now, a modern sapiens type. He will in the courses of the next hundreds of millennia presumably change considerably physiologically and physically.<sup>10</sup>

\*The fossils of the newly discovered “*Homo Habilis*” from East Africa are estimated to be 1,750,000 years old. (*N. Y. Times*, March 18, April 3 & 4, 1964. Another estimate traces human origins back about 15 million years!—*N. Y. Times*, April 12, 1964.)

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### B. *The Psychedelic Correlate:*

What does all that evolutionary business have to do with you or me or LSD or the religious experience? It might, it just might, have a lot to do with very current events. Many, and I am just bold enough to say most, LSD subjects say they experience early forms of racial or sub-human species evolution during their sessions. Now the easiest interpretation is the psychiatric: "Oh yes, hallucinations. Everyone knows that LSD makes you crazy, and your delusions can take any psychotic form." But wait; not so fast. Is it entirely inconceivable that our cortical cells, or the machinery inside the cellular nucleus, "remembers" back along the unbroken chain of electrical transformations that connects every one of us back to that original thunderbolt in the pre-Cambrian mud? Impossible, you say? Read a genetics text. Read and reflect about the DNA chain of complex protein molecules that took you as a uni-celled organism at the moment of your conception and planned every stage of your natural development. Half of that genetic blueprint was handed to you intact by your mother, and half from your father, and then slammed together in that incredible welding process we call conception.

"You", your ego, your good-old American-social-self, have been trained to remember certain crucial secular game landmarks: your senior prom, your wedding day. But is it not possible that others of your ten billion brain cells "remember" other critical survival crossroads like conception, intra-uterine events, birth? Events for which our language has few or no descriptive terms? Every cell in your body is the current-carrier of an energy torch which traces back through millions of generation-transformations. Remember that genetic code?

You must recognize by now the difficulty of my task. I am trying to expand your consciousness, break through your macroscopic, secular set, "turn you on", give you a faint feeling of a psychedelic moment, trying to relate two sets of processes for which we have no words—speed-of-light energy-transformation processes and the transcendent vision.

I'm going to call for help. I could appeal to quotes from Gamow the cosmologist, or Eiseley the anthropologist, or Hoyle the astronomer, or Teilhard du Chardin the theological biologist, or Aldous Huxley the great visionary prophet of our times, or Julian Huxley whose pharmacological predictions sound like science-fiction. I could call upon a hundred articulate scientists who talk in dazed poetry about the spiritual implications of their work. Instead, I am

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going to read a passage by the German anthropologist Egon Freiherr von Eickstedt. The topic is the spiritual attitude of Australopithecus. The point is that this description of the world-view of a tiny monkey-man who lived a million years ago could be a quote from any one of a hundred LSD reports I've read in the last three years. Von Eickstedt's research leads him to say that,

In the way of experience there is dominant, throughout, a kaleidoscopic interrelated world. Feeling and perception are hardly separated in the world of visions; space and time are just floating environmental qualities . . . Thus the border between I and not-I is only at the border of one's own and actually experienced, perceptible world . . . But this by no means denotes merely bestial brutality and coarseness which is so erroneously and often ascribed to the beginnings of humanity. Quite the reverse. The thymality within his own circle means just the opposite, tenderness, goodness and cheerfulness, and allows with complete justification the presumption of a picture of intimate family life and the specific teaching of the children, also need of ornament, dance and much happiness. Thus the extremes of feeling swing with the mood between fear and love, and the dread of the unknowable . . .<sup>11</sup>

We have in our files an LSD report from a world-renowned theologian with astonishing parallels to this quotation.

The best way I can describe the experience as a whole is to liken it to an emotional-reflective-visual kaleidoscope . . . Experiences involving these three components kept dissolving continuously from one pattern into another. Emotionally the patterns ranged from serene contentment and mild euphoria to apprehension which boarded on, but never quite slipped into, alarm. But overwhelmingly they involved (a) astonishment at the absolutely incredible immensity, complexity, intensity and extravagance of being, existence, the cosmos, call it what you will. Ontological shock, I suppose. (b) The most acute sense of the poignancy, fragility, preciousness, and significance of all life and history. The latter was accompanied by a powerful sense of the responsibility of all for all . . . Intense affection for my family . . . Importance and rightness of behaving decently and responsibly.

#### (4) **The Ego Question:**

##### A. *The Scientific Answer:*

The question "Who am I?" can be answered at many levels. Psychologists can describe and explain your psychogenesis and personal evolution. Sociologists and anthropologists can explain the structure of the tribal games which govern your development. Biologists can describe your unique physical structure. But the essence of you and "you-ness" is your consciousness. You are not a psych-

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ological or social or bodily robot. No external description comes close. What cannot be measured, replaced, understood by any objective method is your consciousness. And where is this located? In your nervous system. The secular-game engineers can entertain you with their analyses of your macroscopic characteristics, but the biochemical neurologist is the man to listen to. He is the person who can locate "you" in the five-billion-year sequence by describing the capacities of your cortex. Your consciousness is a biochemical electrical process.

The human brain, we are told,

is composed of about 10 billion nerve cells, any one of which may connect with as many as 25,000 other nerve cells. The number of interconnections which this adds up to would stagger even an astronomer—and astronomers are used to dealing with astronomical numbers. The number is far greater than all the atoms in the universe . . . . This is why physiologists remain unimpressed with computers. A computer sophisticated enough to handle this number of interconnections would have to be big enough to cover the earth.<sup>12</sup>

Into this matrix floods "about 100 million sensations a second from . . . [the] various senses." And somewhere in that ten-billion-cell galaxy is a tiny solar system of connected neurons which is aware of your social self. Your "ego" is to your cortex what the planet Earth is to our galaxy with its 100,000 million suns.

B. *The psychedelic answer* to the "I" question is the crux of the LSD experience. Most of the affect swirls around this issue. As Erik Erikson reminds us, it's hard enough to settle on a simple tribal role definition of "Who am I?" Imagine the dilemma of the LSD subject whose cortex is suddenly turned on to a much higher voltage, who suddenly discovers his brain spinning at the speed of light, flooded by those 100 million sensations a second. Most of the awe and reverent wonder stems from this confrontation with an unsuspected range of consciousness, the tremendous acceleration of images, the shattering insight into the narrowness of the learned as opposed to the potentiality of awareness, the humbling sense of where one's ego is in relationship to the total energy field.

- (a) I was delighted to see that my skin was dissolving in tiny particles and floating away. I felt as though my outer shell was disintegrating, and the 'essence' of me was being liberated to join the 'essence' of everything else about me.
- (b) Two related feelings were present. One was a tremendous freedom to experience, to be I. It became very important to distinguish between

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'I' and 'Me', the latter being an object defined by patterns and structures and responsibilities—all of which had vanished—and the former being the subject experiencing and feeling. My normal life seemed to be all Me, all demands and responsibilities, a crushing burden which destroyed the pleasure and freedom of being 'I'. Later in the evening the question of how to fit back into my normal life without becoming a slave of its patterns and demands became paramount. The other related feeling was one of isolation. The struggle to preserve my identity went on in loneliness; the 'I' cannot be shared or buttressed. The 'Me', structured as it is, can be shared, and is in fact what we mean when we talk about "myself", but once it is thus objectified it is no longer I, it has become the known rather than the knower. And LSD seemed to strip away the structure and to leave the knowing process naked—hence the enormous sense of isolation: there was no Me to be communicated.

- c) All this time, for about 2-3 hours, although there was thinking, talking going on, my mind was being used, yet there was no ego . . . . I could with total dispassion examine various relationships that 'I' had with parents, friends, parts of 'myself', etc. People who walked into the room were accepted with the same serene equanimity that I felt about accepting my own mental products; they were really walking around in my mind.
- d) I was entering into another dimension of existence. 'I' was not. Everything was totally dissolved into a flow of matter continuously moving. No time, no space. A feeling of color, but indescribable. Feeling of movement mainly. Awareness that I, the others, are only collections of clusters of molecules, which are all part of the same stream.

For the small percentage of unprepared subjects who take LSD in careless or manipulative settings and experience terror and paranoid panic, their misery invariably centers around the struggle to reimpose ego control on the whirling energy flow in them and around them. Theirs is the exhausting and sad task of attempting to slow down and limit the electrical pulse of the ten-billion-cell cerebral computer. Thorazine, alcohol and narcotics help apply the brakes. So, I fear, do words.



WHEN WE READ about the current findings of the energy sciences such as those I have just reviewed, how can our reaction be other than reverent awe at the grandeur of these observations, at the staggering complexity of the design, the speed, the scope? Ecstatic humility before such Power and Intelligence. Indeed, what a small, secular concept—intelligence—to describe that Infinitude of

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Harmonious Complexity! How impoverished our vocabulary and how narrow our imagination!

Of course, the findings of the pure sciences *do not* produce the religious reaction we should expect. We are satiated with secular statistics, dazed into robot dullness by the enormity of facts which we are not educated to comprehend. Although the findings of physics, genetics, paleontology and neurology have tremendous relevance to our life, they are of less interest than a fall in the stock market or the status of the pennant race.

The message is dimly grasped hypothetically, rationally, but never experienced, felt, known. But there can be that staggering, intellectual-game ecstasy which comes when you begin to sense the complexity of the Plan. To pull back the veil and see for a second a fragment of the energy dance, the life power. How can you appreciate the Divine unless you comprehend the smallest part of the fantastic design? To experience (it's always for a moment) the answers to the four basic spiritual questions is to me the peak of the religious-scientific quest.

But how can our ill-prepared nervous systems grasp the message? Certainly the average man cannot master the conceptual, mathematical bead game of the physics graduate student. Must his experiential contact with the Divine Process come in watered-down symbols, sermons, hymns, robot rituals, religious calendar art, moral-behavior sanctions eventually secular in their aim? Fortunately the Great Plan has produced a happy answer and has endowed every human being with the equipment to comprehend, to know, to experience directly, incontrovertibly. It's there in that network of ten billion cells, the number of whose interconnections "is far greater than all the atoms in the universe."

If you can, for the moment, throw off the grip of your learned mind, your tribal concepts, and experience the message contained in the ten-billion-tube computer which you carry behind your forehead, you would know the awe-full truth. Our research suggests that even the uneducated layman can experience directly what is slowly deduced by scientists—for example physicists, whose heavy, conceptual minds lumber along at three concepts a second, attempting to fathom the speed-of-light processes which their beautiful machines record and which their beautiful symbols portray.

But the brakes can be released. Our recent studies support the hypothesis that psychedelic foods and drugs, ingested by prepared subjects in a serious, sacred, supportive atmosphere, can put the

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subject in perceptual touch with other levels of energy exchanges. Remember the data—the Good Friday study, the Savage study, the 69 religious professionals. Forty to ninety percent telling us they experienced "a greater awareness of God, or a Higher Power, or an Ultimate Reality."

But to what do these LSD subjects refer when they report spiritual reactions? Do they obtain specific illuminations into the four basic questions, or are their responses simply awe and wonder at the experienced novelty? Even if the latter were the cause, could it not support the religious application of the psychedelic substances and simply underline the need for more sophisticated religious language coordinated with the scientific data? But there is some evidence, phenomenological but yet haunting, that the spiritual insights accompanying the psychedelic experience might be subjective accounts of the objective findings of astronomy, physics, biochemistry, and neurology.

Now the neurological and pharmacological explanations of an LSD vision are still far from being understood. We know almost nothing about the physiology of consciousness and the body-cortex interaction. We cannot assert that LSD subjects are directly experiencing what particle physicists and biochemists measure, but the evidence about the detailed complexity of the genetic code and the astonishing design of intra-cellular communication should caution us against labeling experiences outside of our current tribal clichés as "psychotic" or abnormal. For three thousand years our greatest prophets and philosophers have been telling us to look within, and today our scientific data are supporting that advice with a humiliating finality. The limits of introspective awareness may well be sub-microscopic, cellular, molecular and even nuclear. We only see, after all, what we are trained and predisposed to see. One of our current research projects involves teaching subjects to recognize internal physical processes much as we train a beginning biology student to recognize events viewed through his microscope.

No matter how parsimonious our explanations, we must accept the fact that LSD subjects do claim to experience revelations into the basic questions and do attribute life-change to their visions.

We are, of course, at the very beginning of our research into these implications. A new experiential language and perhaps even new metaphors for the Great Plan will develop. We have been working on this project for the past two years, writing manuals which train subjects to recognize energy processes, teaching subjects

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to communicate via a machine we call the experiential typewriter, and with movies of microbiological processes. And we have continued to pose the question to religious and philosophic groups as I am doing tonight. What do you think? Are these biochemical visions religious?

Before you answer, remember that God (however you define the Higher Power) produced that wonderful molecule, that extraordinarily powerful organic substance we call LSD, just as surely as "He" created the rose, or the sun, or the complex cluster of molecules you insist on calling your "self".

Among the many harassing complications of our research into religious experience has been the fact that few people, even some theological professionals, have much conception of what a religious experience really is. Few have any idea how the Divine Process presents Itself. If asked, they tend to become embarrassed, intellectual, evasive. The adored cartoonists of the Renaissance portray the Ultimate Power as a Dove, or a Flaming Bush, or as a man—venerable, with a white beard, or on a Cross, or as a Baby, or a Sage seated in the Full Lotus Position. Are these not incarnations, temporary housings, of the Great Energy Process?

Last fall a minister and his wife, as part of a courageous and dedicated pursuit of illumination, took a psychedelic biochemical called dimethyltryptamine. This wondrous alkaloid (which closely approximates serotonin, the natural "lubricant" of our higher nervous system) produces the most intense psychedelic effect of any sacramental food or drug. In 25 minutes (about the duration of the average sermon), you are whirled through the energy dance, the cosmic process, at the highest psychedelic speed. The 25 minutes are sensed as lasting for a second and for a billion-year Kalpa. After the session, the minister complained that the experience, although shattering and revelatory, was disappointing because it was "content-free"—so physical, so unfamiliar, so scientific, like being beamed through microscopic panoramas, like being oscillated through cellular functions at radar acceleration. Well, what do you expect? If God were to take you on a visit through His "workshop", do you think you'd walk or go by bus? Do you really think it would be a stroll through a celestial Madame Tussaud waxworks? Dear friends, the *Divine Product* is evident in every macroscopic form, in every secular event. The *Divine Product* we can see. But the *Divine Process* operates in time dimensions which are far beyond our routine, secular, space-time limits. Wave vibrations, energy dance, cellular

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transactions. Our science describes this logically. Our brains may be capable of dealing with these processes experientially.

So here we are. The Great Process has placed in our hands a key to this direct visionary world. Is it hard for us to accept that the key might be an organic molecule and not a new myth or a new word?



And where do we go? There are in the United States today several hundred thousand persons who have experienced what I have attempted to describe to you tonight—a psychedelic, religious revelation. There are, I would estimate, several million equally thoughtful people who have heard the joyous tidings and who are waiting patiently but determinedly for their psychedelic moment to come.

There is, of course, the expected opposition. The classic conflict of the religious drama—always changing, always the same. The doctrine (which was originally someone's experience) now threatened by the *new* experience. This time the administrators have assigned the inquisitorial role to the psychiatrists, whose proprietary claims to a revealed understanding of the mind and whose antagonism to consciousness-expansion are well known to you.

The clamor over psychedelic drugs is now reaching full crescendo. You have heard rumors and you have read the press assaults and the slick-magazine attacks-by-innuendo. As sophisticated adults you have perhaps begun to wonder: why the hysterical outcry? As scientists you are beginning to ask: where is the evidence? As educated men with an eye for history, you are, I trust, beginning to suspect that we've been through this many times before.

In the current hassle over psychedelic plants and drugs, you are witnessing a good-old-fashioned, traditional, religious controversy. On the one side the psychedelic visionaries, somewhat uncertain about the validity of their revelations, embarrassedly speaking in new tongues (there never is, you know, the satisfaction of a sound, right academic language for the new vision of the Divine), harassed by the knowledge of their own human frailty, surrounded by the inevitable legion of eccentric would-be followers looking for a new panacea, always in grave doubt about their own motivation—(hero? martyr? crank? crackpot?)—always on the verge of losing their material achievements—(job, reputation, long-suffering wife, conventional friends, parental approval); always under the fire of the power-holders. And on the other side: the establishment (the administrators, the police, the fund-granting foundations, the job-



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givers) pronouncing their familiar lines in the drama: "Danger! Madness! Unsound! Intellectual corruption of youth! Irreparable damage! Cultism!" The issue of chemical expansion of consciousness is hard upon us. During the next months, every avenue of propaganda is going to barrage you with the arguments. You can hardly escape it. You are going to be pressed for a position. Internal Freedom is becoming a major religious and civil-rights controversy.

How can you decide? How can you judge? Well, it's really quite simple. Whenever you hear anyone sounding off on internal freedom and consciousness-expanding foods and drugs—whether pro or con—check out these questions:

(1) Is your advisor talking from direct experience, or simply repeating clichés? Theologians and intellectuals often deprecate "experience" in favor of fact and concept. This classic debate is falsely labeled. Most often it becomes a case of "experience" versus "inexperience".

(2) Do his words spring from a spiritual or from a mundane point of view? Is he motivated by a dedicated quest for answers to basic questions, or is he protecting his own social-psychological position, his own game investment?

(3) How would his argument sound if it were heard in a different culture (for example, in an African jungle hut, a ghat on the Ganges, or on another planet inhabited by a form of life superior to ours); or in a different time (for example in Periclean Athens, or in a Tibetan monastery, or in a bull-session led by any one of the great religious leaders—founders—messiahs); or how would it sound to other species of life on our planet today—to the dolphins, to the consciousness of a redwood tree? In other words, try to break out of your usual tribal game-set and listen with the ears of another one of God's creatures.

(4) How would the debate sound to you if you were fatally diseased with a week to live, and thus less committed to mundane issues? Our research group receives many requests a week for consciousness-expanding experiences, and some of these come from terminal patients.<sup>18</sup>

(5) Is the point of view one which opens up or closes down? Are you being urged to explore, experience, gamble out of spiritual faith, join someone who shares your cosmic ignorance on a collaborative voyage of discovery? Or are you being pressured to close off, protect your gains, play it safe, accept the authoritative voice of someone who knows best?

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(6) When we speak, we say little about the subject-matter and disclose mainly the state of our own mind. Does your psychedelic advisor use terms which are positive, pro-life, spiritual, inspiring, opening, based on faith in the future, faith in your potential, or does he betray a mind obsessed by danger, material concern, by imaginary terrors, administrative caution or essential distrust in your potential. Dear friends, there is nothing in life to fear, no spiritual game can be lost. The choice is not double-bind but double-win.<sup>14</sup>

(7) If he is against what he calls "artificial methods of illumination", ask him what constitutes the natural. Words? Rituals? Tribal customs? Alkaloids? Psychedelic vegetables?

(8) If he is against biochemical assistance, where does he draw the line? Does he use nicotine? alcohol? penicillin? vitamins? conventional sacramental substances?

(9) If your advisor is against LSD, what is he for? If he forbids you the psychedelic key to revelation, what does he offer you instead?



## SUMMARY

The outline of this paper can be summarized as follows:

(1) Evidence is cited that, depending on the set and setting, from 40 to 90 percent of psychedelic subjects report intense religious experiences.

(2) The religious experience was defined as the ecstatic, incontrovertibly certain, subjective discovery of answers to four basic questions which concern ultimate power and design, life, man and self. It was pointed out that science attempts to provide objective, external answers to these same questions.

(3) We considered the hypothesis that the human being might be able to become directly aware of energy exchanges and biological processes for which we now have no language and no perceptual training. Psychedelic foods and drugs were suggested as one key to these neurological potentials, and subjective reports from LSD sessions were compared with current findings from the energy sciences.

(4) The current controversy over the politics of the nervous system (which involves secular-external versus spiritual-internal commitments) were reviewed, and a checklist for the intelligent voter was presented.

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- <sup>6</sup>McGlothlin, W. H., *Long-Lasting Effects of LSD on Certain Attitudes in Normals: An Experimental Proposal*. [Privately printed, The Rand Corporation, Santa Monica, California, June 1962. Pp. 56.] Cf. McGlothlin, W. H., Cohen, S., & McGlothlin, M.S., *Short-Term Effects of LSD on Anxiety, Attitudes, and Performance*. *Ibid.*, June 1963. Pp. 15.
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## POEM

(from the Maximus Poems)

a century or so before 2000

BC | the year rebegan in

March | festival days

of wild untamed undomesticated hence wild  
savage feral (Father's  
Days our father who is also in  
Tartaros chained in being  
kept watch on by Aegean-  
O'Briareos whose exceeding  
manhood (excellent manhood  
comeliness  
and power - 100 or possibly  
to us the term of change (with  
the reciprocal 1/137 one of the two  
pure numbers out of which the world  
is constructed

(the other one is  
'Earth' mass mother milk cow body  
demonstrably, suddenly, more  
primitive and universal (? Hardly

The problem here is a non-statistical  
proof: Earth 'came into being'  
extraordinarily early, #2  
in fact directly following on  
appetite. Or  
as it reads in Norse  
hunger, as though in the mouth  
(which is an occurrence, is 'there',  
stlocus)

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that the Earth  
was the condition, and that she  
there and then was the land, country  
our dear fatherland the Earth,  
thrown up to form a cairn, as spouse  
of Uranos: a i a

the original name  
of Colchis (cld be a 'local'  
reference, that the Great Name  
the Earth shall have been  
Kuban where those  
inventors of the Vision - the  
Civilizers - were  
'local'? some sure time prior to  
2000

BC

the statistical  
(stands)

outside  
the Stream, Tartaros  
is beyond  
the gods hunger outside  
the ends and sources of Earth  
Heaven Ocean's  
Stream: O'Briareos  
helped out by Poseidon by being given  
Cymopolea, P's daughter, for  
wife, sort of only superintends  
the other two jailers of those  
tied up in  
Tartaros - and those two,  
in other words below below - below  
is a factor of being, underneath  
is a matter this is like the vault  
you aren't all train  
of Heaven it counts  
if you leave out those roots of Earth  
which run down through Ocean to  
the ends of Ocean as well  
the foundations of Ocean

Poem

- by Earth's prompting  
and the advice of Heaven, his grandparents, this person  
Zeus put the Iotunns those who

strain

reach out are

hunger

put em outside (including the last  
the youngest child of Earth  
her last one, by love of Tartaros,  
by the aid of Love as Aphrodite made  
strength in his hands and untiring  
feet - and made of all the virtues  
of Ocean's  
children - snakes a hundred heads  
(a 'fearful "dragon") dark flickering tongues  
the eyes in his marvelous heads 'flashed  
'fire', and fire burned from his heads  
when he looked (at the enemy or  
as Shakti was shooting  
beams of love directly  
into the woman he wanted to be  
full of love ) and there are 'voices'  
inside all his dreadful heads  
uttering every kind of sound (imaginable?  
unspeakable Hugh White says Hesiod  
says (not to be voiced?)

for at one time they made sounds  
such as solely the gods  
caught on to

but at another Typhon  
was a bull  
when letting  
out his  
nature, at another

the relentless lion's  
heart's sound

and at another sounds  
like whelps, wonderful to hear  
and again, at another, he would hiss  
so the sky would burn

they threw him  
into his father's  
place it would take you one year  
from the tossing in this direction and that before you got  
to its pavement, Tartaros lies  
so thoroughly out 'below' but 'outside'  
(having nothing whatsoever to do with  
gods or Earth's . . . but suddenly  
a 'loss' has been suffered: Tartaros  
was once 'ahead' of  
Heaven was prior to  
(in coming into being) this 'child'  
of Earth: Tartaros  
was next after Earth (as Earth  
was next after hunger  
itself - Typhon  
was her child, by Tartaros, even if last  
as Heaven was her child, first

The step back, to the seam  
of the statistical Nebel  
and "End of the World" out of the union of which  
by what occurrence was before  
hunger - it is like Ocean  
which is 9 times around  
earth and sea (Heaven is 9 times  
around earth and sea folding and folding  
earth and sea in its backward it

wraps and wraps the consistency  
of mass in until the stupid story  
of earth and nature is lent  
what in its obviousness and effort it  
can't take time for, and makes its stories  
up, temporality sifts

out of Ocean out of Ocean was born  
3000

(when his wife was Tethys)  
daughters - Tartaros the 'prison'  
beyond the gods and men beyond hunger  
and the foundations of Ocean  
are a seam: Cottus and Gyes,  
with whom Briareos is the third 'guard'  
have their dwelling

ep' 'Okeanoio 'Themethlois  
the lowest part of the bottom tithemi  
θε

Ocean deems  
himself

On that edge or place  
inverted from Ocean starts  
another place  
Tartaros in which all  
who have been by the statutory  
thrown down or overthrown, are  
kept watch on Night and Day  
(Night's house is right over  
their heads, in which one door  
Day goes out when her mother  
comes in and neither  
are ever together at the same time  
'at home' - Hell is just over  
their heads  
and so is the 'way-up', Bifrost  
(Styx's house and Iris the messenger are  
bungled prettinesses of this way  
this marvelous ladder the  
color of all colors  
back where the gods, and appetite,  
and so is the way out for them,  
for these imprisoned original  
created - all of the first creations  
of Earth and Heaven (or of Ocean and Tethys  
all these instances forward of except  
the official story

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Heaven himself the 2nd, Kronos  
who acted for his mother in de-maleing  
his father

is in Tartaros  
away from all the gods

while the glorious allies of loud-crashing Zeus  
Cottus and Gyes, and o'Briareos  
guard them

Typhon  
is in Tartaros,  
threatening as he did (as they had,  
the last to give the gods a scare  
who would have come to reign over mortals  
and immortals

the heat took hold on the dark-blue sea  
when Typhon and Zeus engaged  
Hell trembled, where he rules  
over those who have come to him

and the iotunns before Typhon  
locked up in Tartaros swung  
from the clangor and the Earth  
shaking

he burned all the marvelous heads of the monster  
and conquered him and lashed him  
and threw him down in his mother,  
who groaned

and a great part of her melted  
as tin does from the heat of him blasted  
where Zeus had tossed him

and then in the bitterness of his anger Zeus  
tossed him into Tartaros

The life-giving earth  
had crashed around in burning  
the previous time when all the land had seethed  
and Ocean's streams and the sea

## Poem

had boiled - and it was this 'lava'-  
like which had undone the earlier  
Giants because they were Earth-born  
Earth's own meltedness had burned  
their underpinnings and  
defeated them, against Zeus's  
stance

Cottus and Briareos and Gyes  
had done that day, of the Civilized War,  
their turn - for the Boss

with their missiles added to his  
'bolts' they did their co-evals in, and  
were the ones who chained them

(as the *Theogonia* poet says,  
for all their great spirit, their  
*metathumos*

There it was, Tartaros  
which had been there as early as hunger  
or at least directly after hunger & Earth  
and before Love

Yet Love  
in the figure of the goddess born  
of the frith from her father Heaven's  
parts accompanied Tartaros  
(as Night had Heaven the night  
his son had hurled off his parts)

Love accompanied Tartaros  
when with Earth in love he made  
Typhon

#

Thus  
March

CHARLES OLSON

## Communications:

### *An Open Letter to Mr. Joe K. Adams*

Dear Mr. Adams:

As a "socially unacceptable truth-teller" in all subculture normalizations except (as I recently discovered to my great joy) the eclectic and tolerant one in and around Harvard Square, I responded to your article in the *Psychedelic Review*\* with the kind of zeal Hernan Cortes must have felt after discovering that the Mayan girl, Malinche, could talk to the Tarascan natives for him.

Our university classrooms are filled with your "compartmentalists", camouflaged with pedantic verbiage and fancy formality. I have long been their antagonist, and have learned as well as suffered. As reference, I cite my own experience with the compartmentalist designated by the venerable titles "biochemist" and "biophysicist", as well as with LSD-25. Are those credentials enough to comment on your hypothesis?

I really do agree with your contention that the drug attacks defense mechanisms built up carefully to conceal the truth of our direct sensory perceptions. One would *a priori* imagine, however, that a drug which forced us to see the world as it is would be welcomed. Why, then, is the entire "consciousness-expanding" drug movement confronted with enormous hostility? And why do we tolerate and perpetuate systematic hypocrisy in our culture?

No matter whether one invokes a mystical, psychological or pseudo-biological definition for the phenomenon of consciousness, it is clear that simple, known, organic compounds alter it. Orgies, black masses, fasting, fevers, ritual dancing, and fraternity initiations, equally have changed the state of man's consciousness in the past, but these are far less amenable to isolation and quantification than, e.g., LSD and psilocybin. The excitement here arises from our present position: we are probably on the threshold of a physical basis of consciousness. Perhaps our times are analogous to those at the beginning of the century, which culminated in today's clear concept of the physical basis of heredity.

The self-replicating DNA molecule, containing within its sequence of nucleotide subunits the blueprint for the developing organism, is also the target for inherited mutational changes. These mutations provide the source of variability for evolution, of course.

\*"Psychosis: 'Experimental' and Real." *The Psychedelic Review*, Vol. I, No. 2, (Sept. 1963), 121-144.

## Communications:

It is, however, only in the context of the raw data of evolution—the Devonian fishes and the Jurassic reptiles, Darwin's finches and the adaptive homologies in the mammalian marsupials of Australia—that the significance of DNA biology can be comprehended.

Similarly, the increasing collection of both qualitative experiential data of psychology in general, and drug-induced behavioral alterations in particular, are requisite for a general theory of mental processes. The fact that the potent hallucinogens—psilocybin, mescaline, LSD, harmine and tryptamine—are all structurally-related indole derivatives (and related to the intermediates in the metabolism of the common amino acid, tryptophane) already suggests a common mode of action. Mescaline is related to adrenaline, a known neurosecretory hormone; and caffeine is a purine similar to the nitrogenous bases in DNA (the genetic material). If these facts do not, at best, point to possible physiological mechanisms, they at least attest to the knowability of consciousness, psychosis and mystical experience. The chemistry eloquently testifies to the amenability of man's soul to his own researches.

The most fundamental evolutionary principle is: selection by the environment of those genotypes most fit for survival. It follows that the particular hormonal and biochemical composition present in modern man represents that which maximized the probability of survival of our ancestors. Both our nervous system and the chemistry which modifies it determine our responses to our complicated surroundings. Both, therefore, have been selected for, over the long haul of evolution. It is likely that many factors would have been involved in this maximization: the organism would have to have a fairly accurate perception of the external world in order to act. But such perception would have to be developed within the framework of the evolutionary potential of ancestral forms. For example, when bi-pedal walking was selected for, it had to involve the sacrifice of the grasping ability found in other primate feet. In the same way, it is likely that the enhanced perception which can be experimentally induced by hallucinogens, although possible within the limits of our evolutionary potential, was selected against because, e.g., it involved sacrifice of motor coordination and also precluded our ability to narrow our attention only to those stimuli in the environment relevant to food gathering, procreation, etc. Empathy often impedes action. It is easy to see how a full consciousness of the multitudes of stimuli available at all times in our environs interferes with and confuses the direct goals of survival. Some modification of individual consciousness must be involved in the coordination of individual actions into a group, too. And man, of course, can only survive in groups.

In addition, then, to accurate individual perceptions of the external world, man must contain within his nervous system the profound tolerance for ambiguity between what is directly sensed and what is claimed to be "true" by others. If one could not perpetuate mystiques such as "Communists are evil and out to destroy our American society," or, "Our actions are accountable to an invisible God," for example, thousands of people would not be mobilizable into actions which *per se* are atrocious and unthinkable.

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In some sense, therefore, it is not clear that "hypocrisy is an unstable social state;" it may be necessary for continued, unquestioning group action. However, as the facts of lie-detection devices and the therapeutic value of psychoanalysis and the Catholic confessional corroborate, the individual pays the physically measurable price of tension and neurosis for this hypocrisy. The exposure of this hypocrisy is followed by relief.

To paraphrase W. La Barre, the difference between psychosis and culture lies only in the number of adherents. The tragedy in forcing masses of people to accept the psychosis of our culture is evidenced in the increasing numbers of severely conflicted neurotics it produces. The *a priori* assumption of the normalcy of our society shared by many psychologists, *et al.*, only leads to measures which adjust the individual to perpetual conflict. In some cases the conflict can only be eliminated by the recognition of the hypocrisies of our culture. To multitudes of social workers, marriage counselors, school psychologists, and university professors, this admission is not a tolerable solution.

As you say, however, "The greatly increased exposure to facts and ideas, through mass media, travel in foreign countries, etc., can greatly increase the frequency of psychotic episodes, according to the present theory." But there is no doubt that these things, too, provide a body of evidence that an inherently consistent real world can be perceived by man.

Sincerely,

LYNN SAGAN

## BOOK REVIEWS

### HALLUCINOGENIC DRUGS AND THEIR PSYCHOTHERAPEUTIC USE

Eds. R. Crockett, R. A. Sandison & A. Walk. Springfield, III.: Charles C. Thomas, 1963. Pp. xiii & 192. \$7.50

This volume, the Proceedings of the Royal Medico-Psychological Association in London, 1961, is probably the best discussion of LSD therapy to date. A wide range of views is presented, ranging from the enthusiastic to the sarcastic, and there is an extremely interesting discussion of the moral, social and religious significance of hallucinogenic drug experiences. An introductory section deals briefly with the pharmacology and physiology of hallucinogenic drugs. The most interesting paper in this section is the one by Bradley and Key, summarizing their conditioning experiments with LSD. They conclude that LSD "has a site of action closely related to the neurophysiological mechanisms concerned with the filtering and integration of sensory information" (p. 10).

The contributions to the main theme of the volume, the therapeutic uses of hallucinogens, can be divided into three groups. The first group are analysts who are in the main sceptical of the drugs, even when they have used them on patients. The second group are existentially oriented psychotherapists who emphasize the phenomenology of the experience, its effects on the relationship between therapist and patient, the importance of a nurturing setting and the emergence of repressed material. The third group represents a kind of standard,

empirical, psychiatric approach to these drugs where LSD becomes just another treatment to be tried out, like electroshock, hypnosis or anything else.

The paper by Michael Fordham, the eminent Jungian analyst, may be taken as representative of the first group. On the basis of contact with three patients who had taken LSD in another setting, he concludes (pp. 129-30) that "lasting therapeutic effect of the drug is slight," that "by far the strongest therapeutic agent is the transference," that "essential aspects of it [the transference] cannot be worked through" (although at least two other English Jungians claim that they can), and that "the transference illusion of . . . cure . . . experienced by patients can be participated in by the therapist."

The second group of therapists is exemplified in papers by Sandison (one of the earliest LSD pioneers), by Eisner, Spencer, Cameron, Arendsen-Hein and Lake. Sandison's paper is an extremely balanced presentation. LSD is seen as facilitating insight through the release of unconscious material, both on the personal and on the archetypal level. The importance of environment and special training of therapists is stressed. Sandison also points out that statistical proof of the efficacy of LSD treatment is still lacking, and that religious and ethical considerations may bias the evaluation of this approach. Spencer's paper on permissive group therapy with LSD in schizophrenic women describes methods similar to those developed for the treatment of alcoholics in Canada and for the rehabilitation of convicts in

the United States. The approach consists in creating a completely secure, supportive environment, with minimum interference by the therapists, and letting the patients work out their own problems with the aid of the expanded insight produced by the LSD. Papers by Arendsen-Hein on criminal psychopaths and by Cameron on disturbed adolescents are essentially similar in their methods. Betty G. Eisner discusses the important uses of non-verbal communication between LSD-patient and therapist; this technique has been further extended in the work of Gary Fisher and Lauretta Bender with autistic and schizophrenic children. Perhaps the most subtle presentation in the book is the discussion by Dr. Frank Lake of Nottingham. He is the only one to recognize the clear similarity of LSD experiences to the goal-states of Hindu and Buddhist yoga. "Six years of work with LSD have driven me to a sort of analogy between the nine months of intrauterine life and the nine months of life after birth . . . Just as at the end of nine months you can take away the body, so to speak, which was mother's once, and when the cord is cut you come into a dichotomy; so in the realm of the spirit the child at birth is only a potential unit or ego which may respond to relationships. But the normal formulation of these, as being primarily a matter of the mouth-breast relationship, simply does not tie up with LSD experience. This has something to do with being itself, and being itself has something to do with the umbilical cord of the distance receptors, of sight and of hearing . . . And the constant experience one has is that the infant after birth is dependent for being itself, for

its very humanity, for the growth of personality, on the availability of this relationship, on the fact that the mother always comes down to where the infant is and lifts it up to herself" (p. 152).

The third group of therapists give one the impression of having missed the main point of what they were about. For example, in a paper by Delay and his associates the point is made that psilocybin can be used as a diagnostic procedure because, under the drug, the neurosis is revealed in exaggerated form, as in a caricature. "In a case of a typical depression of a year's duration, a marked melancholic reaction appeared under the influence of the drug, and cure by E.C.T. confirmed the diagnosis" (p. 40). Shorvon, in a paper on therapy through brain-washing, states that "my experience and that of some of my colleagues in the use of LSD is limited, but I think we have seen enough to question the more grandiose claims advanced by some. I have used the drug for abreactive purposes, but do not think it was quite as effective as abreactions obtained under methedrine and ether" (p. 77). De Groot, discussing the treatment of patients with "depersonalization syndromes", states, "They received hallucinogens in varying combinations and doses. Cannabis indica, lysergic acid diethylamide and an experimental hallucinogen. The LSD was given orally and parenterally in two of the patients and was even tried in combination with E.C.T. Two of these patients have not benefited from their treatment. The third eventually discharged herself and later, in the face of difficulty, committed suicide" (p. 99). Ismond Rosen describes a psychotic

patient who was given twenty LSD treatments, all of which consisted of the "living out of aggressive desires" and guilt. When her therapist went on vacation she regressed, became suicidal and depressed. "She refused further psychotherapy and LSD. Leucotomy, which released primitive aggressive feelings, was then performed. With further psychotherapy she improved, and for the past three years she has lived in a private home and worked satisfactorily. Her LSD and psychotherapy appear to have contributed materially towards this" (p. 138). It seems clear from these papers that the therapist's personal experience with LSD seems to be the crucial variable that separates successful from unsuccessful treatment. Without this, the LSD is simply assimilated to some other technique, such as ether, or E.C.T., and consequently misused.

Two reports are presented of the use of phencyclidine (Sernyl), a non-indolic, analgesic, hallucinogenic agent. It has been used with some success in neurosis of various kinds. It apparently differs from LSD in being of shorter duration, and in not producing increased powers of self-observation. Other comparisons are hard to make, since no experiential data are given. Marked changes in body image and hallucinations do occur.

For the general reader, the discussion on the significance of the drug experiences is likely to prove the most valuable. G. Rattray Taylor, author and journalist, explores the question of the content of hallucinations, which is generally left untouched by the psychiatric discussions.

What kind of memory mechanisms must the brain have to store these fantastic images? Is not the "depersonalization" of the psychiatrists identical with the loss of individuality described by the mystics? Diffusion of ego-boundaries has social implications. "If . . . a weakening of ego boundaries makes for a sense of brotherhood, and a strengthening of them makes for a sense of separation, then, clearly, social peace and cooperation may be related to this psychological parameter. So—if one can make a wild speculation—what might happen if one took hallucinogenic drugs in very small doses over a protracted period, so as slightly to shift the balance in one's brain, a degree of hardening of the ego limits, as it were?" This "wild speculation" has of course been the subject of utopian experimentation in several centers in the USA and Canada.

Christopher Mayhew presents a fascinating description of his mescaline experiences. They included states of "complete bliss" lasting several years which, in terms of clock time, did not take up more than a few seconds (to the outside observer). "We have a broad choice. We can either say that the experience certainly happened, but lasted for only a fraction of a second, and that during this time a powerful hallucination, besides producing an overwhelming emotional impact, deluded me into thinking I was conscious for a very long period; or we can say the experience certainly happened, but took place outside time" (p. 173).

Francis Huxley, a social anthropologist, nephew of Aldous Huxley, writes of the casting-off of conventional role-playing in LSD ex-



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periences; we can see it "as an effort of consciousness to rid itself of false identifications and experience its own ever-changing identity" (p. 176).

One of the most fascinating experiences to be gained under LSD is that during which the subject-object distinction is done away with. It is replaced not by that state imputed to infants unable to distinguish things in the outside world from themselves, but by a recognition that nothing that exists and is experienced can be properly classified as "an object" since the very act of experiencing it makes it a part of yourself and therefore of your subjectivity. Strangely enough, however, this recognition does not necessarily destroy the thing's individuality: it remains itself however much it also becomes a vehicle for the awareness of yourself. This very curious sensation is made even more astonishing when what you experience is another person: you then find that this vehicle for your self-awareness is at the same time using you as a vehicle for his self-awareness. I would not like to talk about the implications of this experience: besides, Dante has done it in the *Paradiso*.

It is interesting to speculate whether such a symposium could be held in the United States at the present time. In this reviewer's opinion, the parties in the disputes here are already too alienated from each other even to talk. England, on the other hand, is a small country with a geographical center for the intellectual elite. Debates are always being carried on, the personalities are known, the dialogue is more highly valued than the resolution. The present volume reflects this situation.

—R. M.

### ECSTASY: A STUDY OF SOME SECULAR AND RELIGIOUS EXPERIENCES

By Marghanita Laski. Bloomington: Indiana University Press, 1961, Pp. xiv & 544. \$10.00

One of the wholesome corrections of our times is the upsurge of interest in what loosely may be called "the psychedelic experience". In such a context the term would include not merely experiences stimulated with the help of drugs but also mystical and artistic states of mind in general which transcend the ordinary perceptions of everyday reality in order to carry the individual seemingly beyond himself. One may hope that the inheritance of the Enlightenment, which has restricted the Western world too narrowly to the evidences of reason, will be balanced by that respect for the fruits of the non-rational necessary to deepen and enrich our culture.

The volume under review is one indication of the trend. The author tells us in the introduction that, having written a novel featuring an ecstatic experience, she later began to question her basis in reality and so was led to study the phenomenon as systematically as she was able. The results she sets down in the volume. The study can hardly be called truly scientific, and doubtless many social scientists will dismiss it as a very sloppy performance. It is full of speculation, fruit of the insights and often the prejudices of the author. On the other hand, it is her intuitions that give the work significance, while it is the attempt to systematize her observations that makes the book to some degree scientific. Thus it is neither science nor art but a happy combination of the

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two, which will commend itself to perceptive scholars and critics.

Her method was first to find 60 subjects who could testify to ecstatic experience and were willing to fill out a questionnaire. For this she had to circulate but 63 questionnaires, of which she discarded three negative or doubtful cases. To this she added 27 cases of literary descriptions of ecstasies from such pens as those of Wordsworth, Tennyson, Virginia Woolf, and C. P. Snow; and 22 accounts of religious ecstasy mostly from classical mystics like Teresa of Avila, van Ruysbroeck, Plotinus, and Augustine. From these protocols she then examines ecstatic experience for such things as its "triggers" and its general characteristics.

From the same data, she has derived her criteria of ecstasy. First of all, the description of the experience must be characterized to some extent by spontaneity. Then it must contain at least two expressions of feelings of gain such as unity, joy, salvation, or new knowledge; and either an expression of loss, such as loss of time, worldliness, or sin; or a "quasi-physical" feeling such as light, heat, enlargement, or peace. That these criteria are very idiosyncratic she herself seems to recognize, for she confesses that she cannot equate her criteria with anyone else's (p. 46).

Miss Laski must be commended for her precision in her definition of ecstasy. She derives it more or less empirically, though selectively, and thus makes clear to the reader what she means by the term and so to what state of mind her conclusions pertain. Her criteria, however, seem unnecessarily narrowing. For one thing, she confines ecstasy to the pleasant and

constructive and excludes the shattering, the horrifying, the painful, or the belittling. This means that it would be difficult to reconcile her rubrics with those of Rudolf Otto, for example, whose *Idea of the Holy* defines religious ecstasy in such a way as partly to overlap Miss Laski's and yet includes the awe-inspiring "mysterium tremendum".

In this way we can understand Miss Laski's rejecting drug-influenced experiences as ecstasies. She documents her case in a chapter in which she examines the descriptions of six persons who describe experiences with mescaline and one with LSD. Two of these persons (one being Aldous Huxley) evaluate their experiences positively, two negatively, with the others somewhat in between. It is pointed out that the drug experiences differ from those of Miss Laski's cases in being of greater duration, having fewer "up-expressions", often revealing incongruity, involving more criticism, often creating panic, and sometimes making humanity seem ridiculous and contemptible. One might well differ from Miss Laski's depreciation of such outcomes, particularly when she makes the point that while ecstasy frequently has the effect of intensifying one's appreciation of what one has regarded as superior, under the psychedelics beauty and meaning are often seen in the commonplace. One may remark simply that the latter is a matter of opinion. Much of Wordsworth's poetry would refute her, to give just one example. Also, when she objects to the fact that the psychedelics may stimulate the hellish and the frightening, it could be pointed out that subjects who have experienced such reactions often report afterwards that

results prove to be deeply meaningful and helpful. Also one is a little puzzled at Miss Laski's identifying alcohol as the "chosen drug" of the West that, she says, leads to activity, while other drugs are more Eastern and lead to passivity (p. 259). Most of those who have had the psychedelics would be inclined to reverse these roles, at least so far as the psychedelics and alcohol go. One has a feeling that the author is just a bit prejudiced in these chapters. Miss Laski's criticism would be considerably more persuasive if she, like Professor Zaehner, had given the psychedelics a trial herself.

We must not, however, let our criticism get out of focus and condemn the whole book because a few chapters seem unsound. There are very few people, no matter how scholarly, who appear to be able to view the psychedelics dispassionately, whether in favor or against. Doubtless at least some of the objections to them may be a reaction to those who seem to be proposing them as a good in themselves rather than simply as instruments. They are valuable insofar as they tell us something of the mind and, depending on how they are handled, may or may not be useful in the "production" of better religion, better art, and better psychotherapy. Miss Laski seems to have been more of a participant in her own kind of ecstasy, and it is in this area where she has made herself into something of an expert. Consequently it is in the rest of the book rather than when she talks about drugs that she is more illuminating.

Certainly the book is significant for critics and students of art, religion, and literature, as it will be also for psychologists studying religion and esthetics. The general subject matter

of the ecstasy, both as covered by Miss Laski and also when it touches neighboring areas, requires to be taken more seriously, both in study and, so far as possible, in practice. It is with this in mind that we commend this original and interesting volume.

—Walter Houston Clark

#### CHAMPIGNONS TOXIQUES ET HALLUCINOGENES

By Roger Heim. Paris: N. Boubée & Cie., 1963. Pp. 328, figs. 40, graphs 3, maps 3, 42 F (\$8.58).

The botanical world has long waited for such a handy, yet authoritative, work on poisonous and hallucinogenic mushrooms. Heim, Director of the Muséum National d'Histoire Naturelle in Paris and a member of the French Académie des Sciences, is one of the world's outstanding mycologists, specializing in fungi of the tropics, and, without a doubt, stands alone as the mycological authority on poisonous and narcotic mushrooms. Author of a number of books and many technical papers, he has recently, in collaboration with the American ethnomycologists, R. G. and V. P. Wasson and the Swiss pharmaceutical chemist, A. Hofmann, been instrumental in presenting the extraordinary picture of the use in Mexico of sundry sacred, hallucinogenic mushrooms in religious rites.

An appreciation of the extraordinary range of topics in this little volume may be had from a brief examination of what it covers. The 14 chapters treat: I. Poisoning by Fungi through the Ages; II. Survey of Fungal Poisoning in the Tropics and

Sub-tropics; III. Classification of Poisonous Mushrooms and Syndromes; IV. Syndromes caused by Poisonous Amanitas; V. Syndromes caused by Lepiotes rosissantes and *Cortinarius orellanus*; VI. Muscarine Intoxications; VII. Inconstant or Conditional Intoxications; VIII. Mushrooms Poisonous when Raw; IX. European Mushrooms causing Gastro-Intestinal Upsets; X. Various Intoxications; XI. Hallucinogenic Mushrooms with Psychotonic Action; XII. Hallucinogenic Mushrooms with Psychodysleptic Action; XIII. Hallucinogenic Mushrooms with Psycholeptic Action; XIV. Ergotism.

In these compact 328 pages one can find adequately discussed the botany, chemistry, physiological activity, toxicology, history, and ethnology of the poisonous mushrooms of the world. The indices (botanical and chemical) unlock much of the wealth of the book with a minimum of effort.

The format is pleasing. The type is easy to read and is printed on a good quality paper. The drawings are clear and bold in style. The binding is strong and the jacket interesting and attractive. All in all, Heim has given us a book which will go far beyond the mycologist in its appeal. It will long stand as the most up-to-date and inclusive book in a fascinating field.

—Richard Evans Schultes

#### MISERABLE MIRACLE

By Henri Michaux. Translated from the French by Louise Varèse. San Francisco: City Lights Books, 1963. Pp. 89. \$1.95

"This book is an exploration. By means of words, signs, drawings. Mescaline, the subject explored . . . How to describe it! It would require a

picturesque style which I do not possess, made up of surprises, of nonsense, of sudden flashes, of bounds and rebounds, an unstable style, to-bogganing and prankish. In this book, the margins, filled with what are epitomes rather than titles, suggest very inadequately the *overlappings* which are an ever-present phenomenon of mescaline."

Thus Michaux introduces his own book, which is in many ways the most graphic verbal account of psychedelic drug states which has yet appeared. Perhaps the French tradition of passionate intellectual introspection has something to do with it. The fragmentation of thought processes, the cascades of images, the "retinal circus" have never been more beautifully shown in words.

And yet there is a curious discrepancy: in his evaluations, Michaux uses phrases such as "tawdry spectacle", "inharmonious mescaline"; calls it "unpleasant", "terrible buffetings", "the agony of the first hour". But listen to this description:

On the edge of a tropical ocean, in a thousand reflections of the silver light of an invisible moon, among undulations of restless waters, ceaselessly changing . . .

Among silent breakers, the tremors of the shining surface, in the swift flux and reflux martyring the patches of light, in the renderings of luminous loops and arcs, and lines, in the occultations and reappearances of dancing bursts of light being decomposed, recomposed, contracted, spread out, only to be redistributed once more before me, with me, within me, drowned, and unendurably buffeted, my calm violated a thousand times by the tongues of infinity, oscillating, *sinusoidally* overrun by the multitude of liquid lines, enormous with a thousand folds, *I was and I was*

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not, I was caught, I was lost, I was in a state of complete ubiquity. The thousands upon thousands of rustlings were my own thousand shatterings.

An ecstatic vision. Yet the marginal notes read: "torture of undulation", "torture of what is unstable . . . torture of being tickled by iridescence". Torture?

That day my cells were brayed, buffeted, sabotaged, sent into convulsions. I felt them being caressed, being subjected to constant wrenchings. Mescaline wanted my full consent. To enjoy a drug one must enjoy being a subject.

This is the lesson that everyone who has ever taken a psychedelic drug learns: if you attempt to control or master the effects, you will not enjoy them, or at best you will oscillate between pleasure and torture. In his third experiment this insight is verified:

And so that day was the day of the great opening. Forgetting the tawdry images which as a matter of fact had disappeared, I gave up struggling and let myself be traversed by the fluid which, entering me through the furrow, seemed to be coming from the ends of the earth. I myself was torrent, I was drowned man, I was navigation . . . I was alone, tumultuously shaken like a dirty thread in an energetic wash. I shone, I was shattered, I shouted to the ends of the earth. I shivered, my shivering was a barking. I pressed forward, I rushed down, I plunged into transparency, I lived crystallinely.

Then Michaux describes some of the characteristics of mescaline: blinding images, crystals, sheets of colors, elongated forms, broken lines. "For anyone who has taken mescaline, even once, the arts of Mexico (Zapotec and Toltec statues; Aztec temples), with

their multiple broken lines, become eloquent, take on new significance." The movements: tremblings, oscillations, vibrations; a four-minute systole-diastrale of little death and resuscitation, shipwreck and rescue; undulations, "miniature seisms," pullulations.

Cellular autopsies, or beyond the cellular where energies are discerned better than particles, and where the images released by an overactive mind are instantly superposed as on a screen . . . the phenomenon of ideas gravitating like planets is striking and easy to follow (except when they launch their dance in earnest). An idea arrives, quickly ceases to exist. When it returns a few minutes later it seems absolutely new. Just before it disappears again you have a fugitive notion, if not of recognizing it, at least of having passed close to it before. But when? . . . the apparently planetary revolutions of an accelerated universe are one of the wonders of mescaline. Also, experimentally, mescaline creates the world of relativity. Makes a display of relativity. Suddenly, forty minutes after mescaline has been taken, the speed of the images is fantastically increased and time turned topsyturvy. Everything is modified. Ideas are balls rather than ideas. The improbable unreality of reality is obvious, violent. The swift, shining thoughts revolve like astral bodies. Coming out of mescaline you know better than any Buddhist that everything is nothing but appearance.

Later, he describes how "mescaline demolished some of my effectual barriers, the ones that make me myself and not one of the others among my possible 'me's.' It took me weeks and weeks to reconstruct them and to shut myself inside them again . . . My

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drug is myself, which mescaline banishes."

So it seems clear—mescaline demolishes the ego; if you like being inside your ego, you dislike mescaline. But then why were the experiments repeated?

The fourth chapter is a comparison of mescaline with Indian hemp: racing car vs. pony. Hashish provokes bursts of laughter, "optical dexterity", sensation of heights, of lightness, of being suspended. There is no space here to discuss in detail the fifth chapter—a fascinating and illuminating account of a mescaline psychosis. "The innumerable waves of the mescaline ocean" came pouring over him and knocked him down. The breakdown of the ego-structures, the ensuing panic, the hasty and devious construction of new "mad" realities. For anyone interested in the mechanisms of the psychotic process, this section contains a wealth of insight and information.

In a final set of reflections, Michaux makes two observations which to this reviewer's knowledge have not been made before and which deserve further study. One is the importance of *interruptions*: interruptions of thought can lead to the belief, common in psychosis, that ideas are being stolen or controlled; interruptions of attention can lead to uncertainty as to the comings and goings of others; interruptions of will-power can lead to feelings of weakness, vulnerability.

The second concerns *rhythms as antidotes*. Michaux recounts how beating out a slow rhythm with the hands leads to instantaneous relief from "repetitive jitters" under mescaline. Earlier, the soft warm touch of a rug had served the same purpose.

Also, mountain air is anti-drug. (Is it the altitude and thin air, or is it the natural grandeur that soothes? Ocean, desert, night sky, deep forest, all have similar effects). A systematic study of health-giving, ego-relaxing experiences should be made. Rhythm, primary sensations, deep breathing, natural grandeur—what do these have in common? The efficacy of rhythm may have something to do with the spontaneously rhythmic, "breathing" character of the visions. One might also consider stroboscopes, the Russian sleep machine, and voodoo-drum trances, in this connection.

The account does not show any awareness of the larger philosophic and social implications of psychedelic experiences. Perhaps these are discussed in his other works. His *Connaissance par les gouffres* has recently been translated as *Light Through Darkness* (N.Y.: The Orion Press, 1963, \$5.00) and will be reviewed in the next issue.

For verbal virtuosity and introspective acuity in describing the opened mind, this book is first-rate.

—R. M.

### EXPLORING INNER SPACE

Personal Experiences Under LSD-25. By Jane Dunlap. Intro. & appendix by R. S. Davidson. New York: Harcourt, Brace & World, 1961. Pp. 216. \$3.75

### MY SELF AND I

By Constance A. Newland. Foreword by H. Greenwald. Intro. by R. A. Sandison. New York: Coward-McCann, 1962. \$4.95. Signet Books, 1963, Pp. 256. \$0.75

## THE DISCOVERY OF LOVE

A Psychedelic Experience with LSD-25. By Malden Grange Bishop. Foreword by Humphry Osmond. A Torquil Book, distributed by Dodd, Mead, New York, 1963. Pp. 176. \$4.00

It is now well known that a person who takes LSD undertakes a voyage the nature of which is unpredictable and indescribable, but which can so profoundly affect the person's life that he feels impelled to communicate. The research files of psychiatrists and psychologists all over the country are filled with thousands of psychedelic reports, attempts to pin down in words experiences which our linguistic apparatus does not recognize. Professional writers are especially prone to verbalize the ineffable and in the last three years, three new LSD books have appeared.

As these experiences become more common, the need for a new vocabulary will make itself acutely felt. Through the astonishing variety of hallucinations and visions, certain regularities recur; the revelations and insights begin to have patterns that one can recognize. Yet in spite of these common aspects, each voyage assumes a particular and individual character. Each mind-manifestation (if the person is prepared and open) assumes universality as it leaves the conceptual ego behind; but on its return to the talking, thinking, writing human machine, those particular features will be verbalized which fit most easily into the pre-existing order. Thus, Aldous Huxley, the artist and seer, writes beautifully of the light, the colors and the naked immediate perception of the mescaline state. Alan Watts, the Zen interpreter,

tells of the interpenetration of our experience and the world, of the playful shattering of cherished game-boundaries. Constance Newland, the psychoanalytic patient in quest of the healthy orgasm, writes of her encounters with the Freudian symbols created by her ever-active sexual imagination. Jane Dunlap, widely read and successful author, writes colorful interior travelogues. Malden Bishop, family man and businessman, writes of the search for love and the effect which the discovery of love has on interpersonal relations.

*My Self and I* will undoubtedly be the most popular of the three books: the paperback edition has visual promise of pornography on the cover, and in content it is closest to the familiar Freud-dominated consciousness of intelligent Westerners. For this reason, it is furthest from the radically new possibilities of psychedelic experience. It is also the least well written of the three, abounding in clichés and even silliness of expression.

The book describes a series of sessions with small doses of LSD in a therapy room, with the regular therapist present, not analyzing or interpreting, but encouraging the deployment of fantasy and the overcoming of resistance. "The Closed-Up Clam", "The Battle of the Sphincters", "The Purple Screw", "The Purplish Poisonous Peapod", "The Slim Black Nozzle", "The Bitten-Off Nipple", etc.—the whole galaxy of the Freudian psychosexual images is there, in vivid hallucinatory detail. Each symbol is "over-determined", connected by the flexible logic of the primary process to every other symbol. With each conflict explained, another deeper layer of

conflict is exposed. In the last chapters, the symbolism approaches some of Jung's archetypes, and the final resolution—fusing the masculine with the feminine component—is definitely Jungian. Apparently the discovery of the traumatic enema nozzle was not enough. In these later explorations, "rich and extraordinary imagery appeared to me—but it was imagery which did not seem related to my specific life history." Since they do not fit into the Freudian framework, these other experiences are ignored. Another time: "... becoming a light which was All Energy. I dissolved into the Nothing which is Everything. Transcendence." But again: "there was no climactic moment of release"—so the transcendent experience, which for many people has had overwhelming life-changing effects, is shelved in favor of further analysis. One might ask, though it is probably impossible to tell, which experiences contributed more to the "cure": those in which a frightening image is traced back to a childhood fantasy-trauma, or those in which the self merges into an ecstatic life-flow compared to which the neurosis was "a pale and paltry thing now."

For someone who has experienced LSD this book has some interest as an account of a psychedelic session that was "programmed" within one particular model of the mind—the psychoanalytic. For someone who has not experienced LSD, this book is not recommended, since it employs a very limited perspective without bringing an awareness of this limitation to the attention of the reader.

*Exploring Inner Space* is a description of five LSD sessions held in the

creativity research project of Dr. Oscar Janiger. No therapy or testing was done, and the subject was left completely free as to areas explored. Her first session took her into a primitive vision of the age of reptiles, devouring, killing, fighting, destroying. "There seemed no end . . . to the props upon which violent emotions were hung." Asking herself why she should have had a vision of evolution, "the answer flashed into my mind. That very morning . . . I had flipped quickly through a magazine, and for a second my glance had fallen on the title of an article by Jimmy Michener: 'Violence and the Whims of Nature over Millions of Years Built a Paradise.' Now I knew that second had influenced the day . . ." Minute and seemingly unimportant events or thoughts immediately preceding a session can profoundly "set" the content of the experience. "The visions of an LSD experience are relatively unimportant and merely serve as hooks upon which can be hung soul-shaking emotions." Perhaps one could carry this one step further and say that the basic experience is not primarily visual at all, or it is *visual* but not *visionary*. Hallucinations, visions are imposed on a formless flow of sensation, giving concrete expression to basic feelings.

What are some of the basic common experiences in deep LSD states? There is first what one may call the vision of *unity*:

For the first time in my life, I became aware of a wonderful oneness existing between all living things, whether plant, animal, or human, whether prehistoric, historic, or present.

Another is what can be termed the vision of *inherent divinity*:

I knew that God penetrated every crevice of the universe, filling every space, regardless of how small, and piercing every wall, regardless of how thick; and how both filled and surrounded every human being. Thus another conviction became a reality: to find God, we had only to look within ourselves and everywhere around us.

Third is the experience one might name after one of these titles, the *discovery of love*:

Only love can fill the vacuum in every heart. Love is God; the two are one. When you think you are hungry for love, it is, in reality, God you are longing for.

This revelation is often accompanied by the realization that a kind of love is possible between humans that is completely non-possessive, open and selfless.

And how is it you love? If your children, husband, or friends displease you I notice you withdraw your love quickly enough. Is love something you can jerk away at will? Real love is like the sun. It warms every heart within its radiance, not a selected few.

Fourth, there is what one might call *basic energy vision*:

... an unshakable conviction that there is indeed a universal and God-created energy which expresses itself as rhythm in all things...

It seemed to me that a God force, a God strength, existed not only inside me and in everything around me but was being demonstrated to me.

These revelations, stated thus baldly and abstractly, are of course not new or original from an intellectual point of view. What all LSD explorers confirm, though, is that the revelations are not just understood intellectually, but felt, lived and experienced with overwhelming intensity.

The intensity of feeling in these LSD experiences is such that writers usually cram their sentences with superlatives, which can become monotonous if the book is read through at one sitting. This dimension of intensity, of overwhelming reality, is one of the most difficult aspects of the psychedelic experience to communicate.

Jane Dunlap's account points out clearly the difference between two kinds of "religious experience": one in which hallucinations are described and interpreted in religious language (a language perhaps better and certainly no worse than any existing alternatives in psychiatry and psychology); and one in which there is direct, mystical contact with the basic life-flow. Most of her experiences were "religious" in the first sense, i.e., conceptually, symbolically; her "set" on entering the LSD experiments was religious. The last session described in the book falls into the second category of mystical experience.

*The Discovery of Love* is probably the best introduction for someone who is interested in taking LSD but still wants another story. It is the description of one session at the International Foundation for Advanced Study in Menlo Park. It provides considerable detail relating to the preparation and ritual surrounding the taking of LSD. Mr. Bishop also gives a rather full portrait of himself beforehand so that one can more readily appreciate the nature of his experiences under LSD. The book is written simply and clearly, without pretense or embellishments. Even though the content of the experiences is radically different from Jane Dunlap's, the four basic visions are here too:

THE RELIGIONS OF THE OPPRESSED

A Study of Modern Messianic Cults, by Vittorio Lanternari. New York: Knopf, 1963. (Translated from the Italian by Lisa Sergio.) Pp. xx & 343. \$6.95

The chapter presently reviewed, that on "The Peyote Cult" (pp. 63-113), is the longest one in a book which also treats of nativistic-religious movements in Africa, prophetic peyote movements in native North America, and messianic movements in Central and South America, Melanesia, Polynesia, Asia and Indonesia. One defect is in the order of arrangement, inasmuch as the peyote cult is dealt with earlier in the volume than the other North American native religious movement which preceded it in time and which could shed ethnological and psychological light on peyotism. Indeed, these other religious movements and those in other areas will be more unfamiliar and interesting to persons interested in primitive religion. None besides peyotism uses psychedelic substances significantly.

The discussion of peyotism is deficient in phenomenological descriptions of the peyote experience which would be of more immediate concern to psychedelic interests. As in the rest of the volume (none of it based on primary research), the approach is a socio-psychological one intended to illustrate the author's theories about the relationship between religion and revolution. The virtues of this work lie in this area of interpretation, rather than in any contribution to our substantive knowledge.

—Weston La Barre

(1) *Unity*: "I was learning that all things are one, and all things are an essential part of my being."

(2) *Inherent divinity*: "I became one with God, when God became me, when I was in God. And I was on top, far above all the world."

(3) *Love*: "Now I know that love does not come by doing things for it. You cannot cry out for love and have someone hear your cry and come and give it to you. Love does not come from without. Love comes from within... Love is the most powerful force in the universe."

(4) *Basic energy*: "Sparks seemed to fly from my finger tips as they touched. They were like highly-charged electrodes. Between them was all the magnetic force of the universe."

Of course, this classification is rough and preliminary and eventually coding systems for the different aspects of transcendent experiences will have to be developed.

To conclude, of the three books, *Exploring Inner Space* is the most readable, although *The Discovery of Love* is probably the best introduction for the average interested layman. None of the three compares even remotely with the classics in the field: Huxley's *Doors of Perception* and Watts' *The Joyous Cosmology*.

—R. M.

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- Wolstenholme, Gordon, ed.: *Man and His Future*. Boston & Toronto: Little, Brown, 1963. Pp. 410. \$6.00

[\*Books listed may be reviewed in future issues.]