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Hallucinogenic Drugs

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HALLUCINOGENIC DRUGS

Honors - H71 Paper # 9

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Presented by James S. Watkins

HALLUCOGENIC DRUGS

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Hallucinogenic drugs have been used for centuries by primitive man to produce mystic effects usually in religious rites. Perhaps these drugs would not have obtained the forefront they had for while if two Harvard professors, Dr. Timothy Leary and Dr. Richard Alpert, had not conducted campus experiments with undergraduate students. Working mainly with mescaline and psilocybin, Leary and Alpert were trying to observe the emotional impact of the drugs and the consciousness broadening power of the drugs. No one seemed to realize that Alpert and Leary were convinced that the mystic insight one could get from psilocybin would be the solution to the emotional problems of Western man.¹ These experiments have raised the question of the worth of the constructive potentials against the admitted hazards.

Of the three best known hallucinogenic drugs -- psilocybin, mescaline, and L. S. D. (d. -- lysergic acid diethylamide) -- LSD must be separated from its source. LSD was first isolated in 1943 from ergot (*Claviceps purpurea*) a fungus that grows on cereal grains.² When Dr. Albert Hofmann, a Swiss chemist, first separated LSD, he was concerned with the potency of the drug. The small dose of 0.00004 of an ounce was reported as sometimes enough to throw an emotionally wobbly individual into a mental hospital.³ It can readily be seen

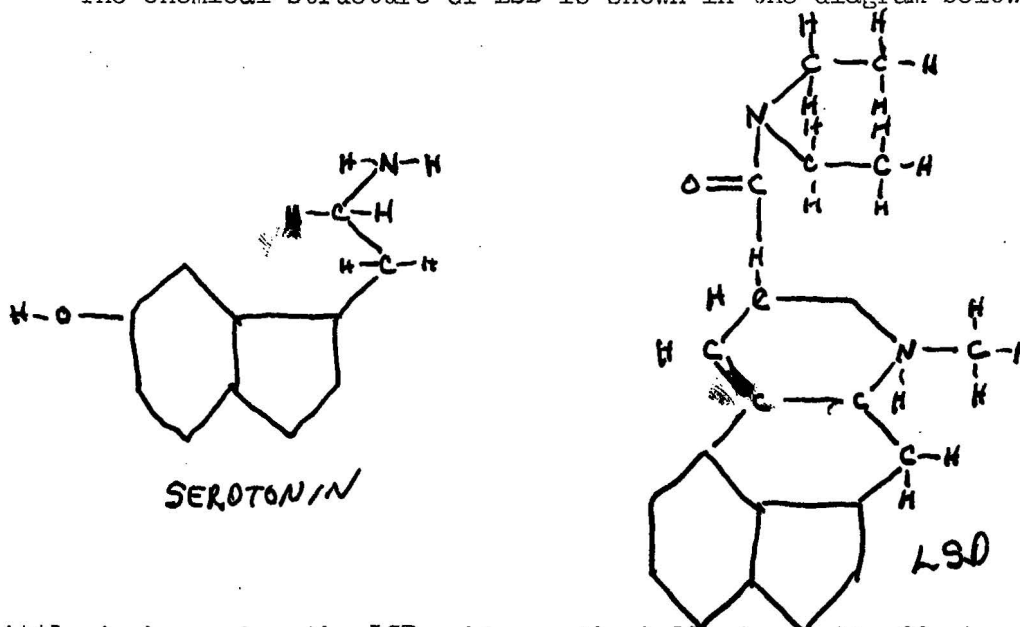
¹Andrew T. Weil, "Strange Case of the Harvard Drug Scandals," Look, 27 (Nov. 5, 1963), p. 43.

²"LSD and All That," Time, 81 (March 29, 1963), p. 72.

³"LSD and All That," p. 72.

why the controversy of the Harvard experiments caused so much concern when students began to find drug companies that would sell them LSD and other drugs directly. LSD has been used by researchers for investigation of the causes of mental illness. It is used very little by unskilled persons because of regulation by the federal government.

The chemical structure of LSD is shown in the diagram below:



Little is known how the LSD achieves the hallucinogenic effects, though extensive research has been done on the types of effects produced. It has been suggested that the structural resemblance of LSD to serotonin, is a substance linked with schizophrenia. An excess of serotonin in certain regions of the brain causes excitement and hallucinations, and a deficiency results in depressive, catatonic states.¹ LSD might facilitate or block some neurohumoral action of serotonin in the brain, but there are objections to this theory because of the over-simplified view of the disease's pattern of symptoms.² Close analogies of LSD

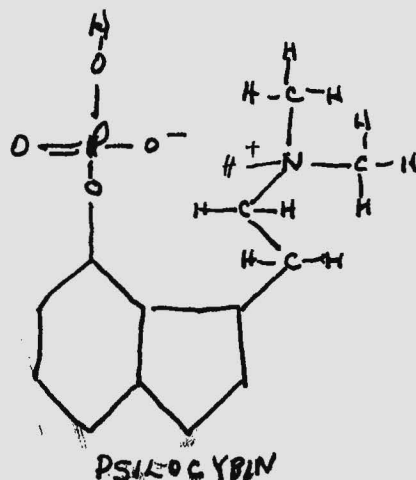
¹F. Barrow, "Hallucinogenic Drugs," Scientific American, 210 (April 1964), p. 33.

²Ibid.

are equally effective or more effective antagonists of serotonin without being significantly active psychologically in man.¹

This does not disprove the hypothesis, however. In man 2-brom LSD blocks the mental effects of a subsequent dose of LSD, and in the heart of a clam it blocks the action of both LSD and serotonin. Perhaps there are "keyholes" at the sites where neurohumors act; in the case of those for serotonin it may be that LSD fits the hole and opens the lock, whereas the psychologically inactive analogues merely occupy the keyhole, blocking the action of serotonin or LSD without mimicking their effects. The serotonin theory of schizophrenia is far from proved, but there is strong evidence for an organic factor of some kind in the disease; it may yet turn out to involve either a specific neurohumor or an imbalance among several neurohumors.²

Psylocybin comes from the mushrooms Strophario cubensis and Psilocybe mexicana.³ Like LSD and mescaline it is an alkaloid and related in structure to the other hallucinogenic drugs. It has the indole ring like serotonin:



Being of mushroom origin psilocybin has perhaps been used for centuries by primitive peoples. The standard human dosage is 20 milligrams as

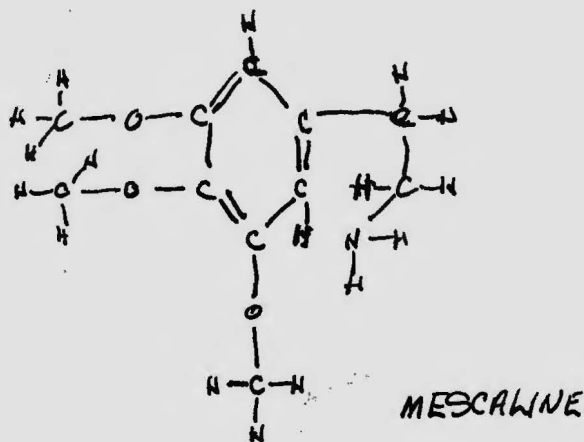
¹Ibid.

²Ibid.

³Ibid., p. 30.

compared to 500 milligrams of mescaline and .1 milligram of LSD.¹
 The function of psilocybin is perhaps similar to LSD, because it shows a phenomenon of cross tolerance with LSD.²

Mescaline is the alkaloid from the peyote cactus. Lophophora williamsii. Between the Rio Grande and central Mexico, where the peyote cactus grows, the dried top of the plants ("peyote cuttons") have been eaten by Indian medicine men and have figured in tribal rituals.³ As previously mentioned, mescaline is the weakest of the three hallucinogenic drugs considered. Mescaline has a similarity to serotonin and the other hallucinogenic drugs structurally by the pseudo-indole ring:



The historical use of the hallucinogenic drugs has been in rites of primitive man. As previously mentioned, LSD has not been

¹Ibid., p. 36.

²Ibid.

³Ibid., p. 32.

used for centuries due to their forms of peyote cactus and mushrooms. They have served the purposes of curing, communion with supernatural powers, divination and meditation to improve self-understanding or social unity.¹ In the Western Hemisphere the ingestion of hallucinogenic plants in pre-Columbian times was limited to a zone extending from what is now the southwestern United States to the northwestern basin of the Amazon.² The Aztec Indians were known to have used hallucinogenic plants for inspiration, and Montezuma is reported to have served a hallucinogen at his coronation to make the ceremony seem more spectacular.³ Today there are a few groups that still have communal use of the drugs.

In the United States and Canada there are some 225,000 Indians to whom the taking of peyote is a solemn sacrament. The Native American Church claims to be the Indian version of Christianity.⁴ They believe that Jesus was the man who gave them peyote in time of need and that God is the great spirit who created the universe and put some of his power into peyote.⁵ The peyotism of the Mescalero Apaches began during the 19th century on the great plains and spread to the Comanches and Kiowas, who transformed it into a religion with a doctrine and ethic as well as ritual.⁶ Peyote gives them "power" to talk directly to God or Jesus, as did their ancestors to the Great

¹ Ibid., p. 30.

² Ibid.

³ Ibid.

⁴ Laura Bergquist, "Peyote: The Strange Church of Cactus Eaters," Look, 21 (Dec. 10, 1953), p. 36.

⁵ "Hallucinogenic Drugs," p. 32.

⁶ Ibid.

Spirit.¹ The Saturday-night meetings, usually held in a traditional tepee, begins with the eating of the sacramental peyote; then the night is spent in prayer, ritual singing; and in the morning there is a communion breakfast of corn, game, and **fruit**.² The whole night is one of a mystical experience of escapism accompanied by drum beating and **sacred rites**.³ The Native American Church has fought hard for the repeal of laws in many states that forbade the use of the drugs in the religious rites.

Despite the unusual use of the **drugs** in the religious ceremonies, the members of the Native American Church are taught that "alcohol and peyote don't mix."⁴ Though the Christian elements of peyotism vary from tribe to tribe, brotherly love, care of the family, and self-reliance are taught.⁵ The American Indian feels that this is one of the few things left that is purely Indian and not borrowed **from the white man**.⁶

The use of the drugs on a more meaningful basis was tried at Boston University's nondenominational Marsh Chapel on Good Friday of 1962.⁷ The mood was set for religious meditation with organ music piped into the dimly lit chapel. The twenty students, mostly divinity students, were given pills -- half LSD and half placebos. The minister gave a brief sermon, and the students were left alone to meditate,

¹"Peyote: The Strange Church of Cactus Eaters," p. 36.

²"Hallucinogenic Drugs," p. 32.

³"Peyote: The Strange Church of Cactus Eaters," p. 36.

⁴Ibid.

⁵"Hallucinogenic Drugs," p. 32.

⁶"Peyote: The Strange Church of Cactus Eaters," p. 40.

⁷"Instant Mysticism," Time, 82 (Oct. 25, 1963), p. 87.

during which all but one student claimed to have had a true religious experience.¹ One of the students related:

"I felt a deep union with God. I remember feeling a profound sense of sorrow that there was no priest or minister at the altar. I had a tremendous urge to go up on the altar and minister the services. But I had this sense of unworthiness, and I crawled under the pews and tried to get away. Finally I carried my Bible to the altar and then tried to preach. The only words I mumbled were 'peace, peace.' I felt I was communicating beyond words."²

The worth of the hallucinogenic mystical encounters with God are debatable. One qualification for a true religious experience is that it is normative and can be communicated and shared with others with ordinary communication, and seemingly these drugs do not afford this normative quality of experience.

The worth of this drug might be debated upon the report of an alcoholic after being treated with LSD; "I could never before believe in a higher power, but now I can."³ The drug has been used to bring alcoholics to face the cause of their addiction and to give them a "transcendental" experience.⁴ The drug does not act as a cure for alcoholism, but as a crutch that brings the person to the awareness of his condition and his need for help. This is the same method used to help mental patients; they are brought to an awareness of their condition by these drugs.

The drugs should be handled with extreme care since they duplicate

¹Ibid.

²Ibid.

³"Vision Drug Increases Religious Feeling," Science Newsletter, 84 (Sept. 21, 1963), p. 184.

⁴Ibid.

the symptoms of severe mental disorder: hallucinations in the form of visual and/or sound sensations, and feelings of unreality, isolation or strange detachment.¹ Some researchers warn that the use of the can bring on psychological breakdown, despite the constructive use in creative thinking. Some feel this creative thinking or great insights may be full of terror, conflict, and guilt, which may cause psychotic collapse when released from the hiding place in the mind.² It should be pointed out that these drugs are not physiologically habit forming like the narcotics such as opium, but the subject may develop a psychological dependence on the release from reality that is given by the drugs.³ The three drugs produce physiological tolerance and cross-tolerance.⁴ As a result of the Harvard drug scandal in 1962 and the use of LSD by beatniks for "kicks," the Los Angeles Society of Chemical Psychologists adopted a measure that "no psychologist shall collaborate with a physician in use of any experimental drugs, such as LSD, except for research purposes in a hospital or university setting."⁵ The United States Food and Drug Administration treats the drug as any other experimental drug; it can only be legally distributed to qualified investigators who will administer them in the course of an approved program of experimentation.⁶

¹E. Mirel, "Danger in Happy Drugs," Science Newsletter, 84 (Aug. 31, 1963), p. 138.

²Ibid.

³"Hallucinogenic Drugs," p. 36.

⁴Ibid.

⁵"LSD and All That," p. 72.

⁶"Hallucinogenic Drugs," p. 36.

The effects of these drugs have been touched lightly. The physiological effects can be easily observed, but the psychological effects are extremely subjective, depending on the setting in which the drug was administered and the purpose for taking the drugs. Traditionally, the drugs have been for religious rites; but the psychological experiments have produced some very unusual reports by the subjects.

The basic physiological effects are those typical of a mild excitement of the sympathetic nervous system. The pupils dilate; the peripheral arterioles constrict; the systolic blood pressure rises.¹ Electroencephalograms shows that the effect on electrical brain waves is usually of a fairly nonspecific "arrousal" nature: the pattern is similar to that of a normally alert, attentive and problem-oriented subject, and if rhythms characteristic of drowsiness or sleep have been present, they disappear when the drug is administered.²

The biochemical mechanism of the drugs is not known for sure. The serotonin resemblance of the three drugs has been previously mentioned as a possible clue to their functions. Several other unconfirmed theories have been proposed. One theory is that the drugs interfere with major enzyme systems and convert normal body substances into forms that act like drugs. Another theory is that these drugs,

¹Ibid.

²Ibid.

because of their chemical structure, may be able to pass through natural physiological barriers and penetrate the reaches of the brain. The similarity of the drugs seems to be the most plausible solution to the question. A mescaline-like compound -- 3,4 dimethoxyphenylethylamine -- has been found in the urine of schizophrenics by a Japanese group.¹ If the compound is of metabolic rather than dietary origin, it could reflect a metabolic defect in schizophrenia.

Despite the objective observability of the physiological mechanisms, there is far less material available on it than on the subjective effects of the drugs. The changes caused by the drugs vary also with the current mood and the personality traits of the subject.

Visual perception changes when the eyes are open. Light and space is affected: colors become more vivid and seem to glow; the space between objects becomes more apparent, as though space itself had become "real," and surface details appear to be more sharply defined.² Many people feel a new awareness of the physical beauty of the world, particularly of visual harmonies, colors, the play of light and exquisiteness of detail.³ One subject reported a distortion of the experimenters' faces into "a leering gargoyle" appearance.⁴

The visual effects are even more striking when the eyes are closed. A constantly changing display appears, its content ranging from abstract forms to dramatic scenes involving imagined people or animals, sometimes in exotic lands or

¹"Unidentified Compound Found in Schizophrenics," Science Newsletter, 84 (Sept. 14, 1963).

²"Hallucinogenic Drugs," p. 33.

³Ibid.

⁴R. M. Goldenson, "Step into the World of the Insane," Look, 18 (Sept. 21, 1954), p. 30.

ancient times. Different individuals have recalled seeing wavy lines, cobweb or chessboard designs, gratings, mosaics, carpets, floral designs, gems, windmills, mausoleums, landscapes, "arabesques spiraling into eternity," statuesque men of the past, chariots, sequences of dramatic action, the face of Buddha, the face of Christ, the Crucifixion, "the mythical dwelling places of the gods," the immensity and blackness of space. After taking peyote, Silas Weir Mitchell wrote: "To give the faintest idea of the perfectly satisfying intensity and purity of these gorgeous color fruits is quite beyond my power." A painter described the waning hours of psilocybin as follows: "As the afternoon wore on I felt very content to simply sit and stare out of the window at the snow and the trees; and at the time I recall feeling that the snow, the fire in the fireplace, the darkened and book-lined room were so perfect as to seem almost unreal.

The changes in visual perception are not always pleasant. Aldous Huxley called one of his books about mescaline Heaven and Hell in recognition of the contradictory sensations induced by the drug. The "hellish" experiences include an impression of blackness accompanied by feelings of gloom and isolation, a garish modification of the glowing colors observed in the "heavenly" phase, a sense of sickly greens and ugly dark reds. The subject's perception of his own body may become unpleasant: his limbs may seem to be distorted or his flesh to be decaying; in a mirror his face may appear to be a mask, his smile a meaningless grimace. Sometimes all human movements appear to be mere puppetry, or everyone seems to be dead. These experiences can be so disturbing that a residue of fear and depression persists long after the effects of the drug have worn off.

Often there are complex auditory hallucinations as well as visual ones: lengthy conversations between imaginary people, perfectly orchestrated musical compositions the subject has never heard before, voices speaking foreign languages unknown to the subject. There have been reports of hallucinatory odors and tastes of visceral and other bodily sensations. Frequently patterns of association normally confined to a single sense will cross over to other senses: the sound of music evokes the visual impression of jets of colored light, a "cold" human voice makes the subject shiver, pricking the skin with a pin produces the visual impression of a circle, a light glinting on a Christmas tree ornament seems to shatter and to evoke the sound of sleigh bells. The time sense is altered too. The passage of time may seem to be a slow and pleasant

flow or to be intolerably tedious. A "sense of timelessness" is often reported; the subject feels outside of or beyond time, or time and space seem infinite. In some individuals on the most basic constancies in perception is affected: the distinction between subject and object. A firm sense of personal identity depends on knowing accurately the borders of the self and on being able to distinguish what is inside from what is outside. Paranoia is the most vivid pathological instance of the breakdown of this discrimination; the paranoid impulses that actually are inside him. Mystical and transcendental experiences are marked by the loss of this same basic constancy. "All is one" is the prototype of a mystical utterance. In the mystical state the distinction between subject and object disappears; the subject is seen to be one with the object. The experience is usually one of rapture or ecstasy and in religious terms is described as "holy." When the subject thus achieves complete identification with the object, the experience seems beyond words.¹

Dr. Harry Asher reported many of the distortions mentioned when he was the subject of an experiment with LSD.² The visual changes were made with color and light: the perception of depth seemed to undulate from nearness to far away; with his eyes closed he saw visions of three women; he had an illusion of his teeth snapping in a flickering light. The most unusual of his experiences was the feeling of having a dual body and personality: one was a strong character that was an improved form of himself; the other was a shadowy, naughty individual. These characters could exchange verbal thoughts, but not talking out loud.

For lack of documentation there is no conclusion of the effect of hallucinogenic drugs on sexual behavior. There is reason to believe that if the drug-taking situation is one in which sexual

¹"Hallucinogenic Drugs," p. 35.

²Harry Asher, "They Split My Personality," Saturday Review, 46 (June 1, 1963), p. 39-43.

relations seem appropriate, the hallucinogenes simply bring to the sexual experience the same kind of change in perception that occurs in other areas of experience.¹ But the drugs are probably neither anaphrodisiacs nor aphrodisiacs -- if indeed any drug is.²

Some people who have taken a large dose of a hallucinogenic drug report feelings of "emptiness" or "silence," pertaining either to the interior of the self or to an "interior of the universe" -- or both as one. Such individuals have a sense of being completely undifferentiated, as though it were their personal consciousness that had been "emptied," leaving none of the usual discriminations on which the functioning of the ego depends. One man who had this experience thought later that it has been an anticipation of death, and that the regaining of the basic discriminations was like a remembrance of the very first days of life after birth.³

Under the influence of one of the hallucinogenes there is usually some reduction in performance on standard tests of reasoning, memory, arithmetic, spelling, and drawing.⁴ The people may simply refuse to co-operate with the tester, therefore, these findings do not indicate an inability to perform well. The motivation is removed by the drugs, and the whole idea of taking a test may seem absurd or cause hostility.

Effects had been noted in those who had taken the drug in the Harvard project. They seemed to have formed an "inside group":

(1) disassociation and detachment ("Initiates begin to show a certain blandness, or superiority, or feeling of being above and beyond the normal world of social reality"); (2) interpersonal insensitivity (example: "inability to predict in advance what the social reaction of a 'psilocybin party' would be"); (3) omniscience, religious and philosophical naivete.

¹"Hallucinogenic Drugs," p. 35.

²Ibid.

³Ibid.

⁴Ibid.

("Many reports are given of deep mystical experience, but their chief characteristic is the wonder at one's own profundity rather than a genuine concern to probe deeper into the experience of the human race in these matters"); and (4) impulsivity.

("One of the most difficult parts of the research has been to introduce any order into who takes psilocybin under what conditions. Any controls have either been rejected as interfering with the warmth necessary to have a valuable experience or accepted as desirable but there not applied because somehow an occasion arises when it seem 'right' to have a psilocybin session").¹

The controversy over the use of the hallucinogenic drugs is between most psychiatrists and psychologists and the followers of Drs. Leary and Alpert. While admitting that the drugs have a great possibility in determining a treatment of psychoneuroses, alcoholism, and social delinquency, they are not ready to go to the extremes that Leary and Alpert have proposed because of the probably effects that these drugs might have on usually normal persons.² LSD experiments have been useful in relieving neurotic depression and in abstinence from alcohol.³ However, much care and control should be taken in administering the drug, based upon the information now available. Dr. Harper's experience lasted two weeks in a modified form,⁴ and children have been known to remain unbalanced for periods as long as a month.⁵ These drugs, being the only link between human psychoses and physiological mechanisms, merit investigation on a controlled scientific bases, but not use in

¹ Noah Gordon, "The Hallucinogenic Drug Cult," Reporter, 29 (Aug. 15, 1963), pgs. 36-37.

² "Hallucinogenic Drugs," p. 37.

³ Ibid.

⁴ "They Split My Personality," p. 40.

⁵ "Hallucinating Drug Now Sold on Black Market," Science Newsletter, 82 (Aug. 4, 1962), p. 72.

the manner of Leary's experiments.

Dr. Richard Alpert, an assistant professor of Psychology and Education, joined with Dr. Timothy Leary, a lecturer in social psychology, in conducting experiments with the hallucinogens on the Harvard campus in 1961 and 1962. Dr. Leary had first been introduced to the drugs in Cuernavaca, Mexico, where he ate a mushroom of one of his friends. Fascinated by Huxley's experiences, Leary interested six Harvard graduate students and Dr. Alpert in a series of experiments. These experiments were carried out with students at Harvard's Center for Research in Personality and at Concord Prison. Observations were made concerning creativity, somatic feelings, visual perception, and memory.¹ The drug sessions cause to be held in private apartments because the formal, clinical atmosphere did not afford surroundings most conducive to creative thought.² Drs. Leary and Alpert soon ran into university administrative disapproval and control by the Federal Food and Drug Administration. The summer of 1962 was spent in Zihuatanejo, Mexico, where they rented a hotel to carry on their experiments. In 1963 Dr. Alpert was dismissed from the Harvard faculty; Dr. Leary had stopped being a Harvard faculty member in April by discontinuing the practice of showing up in his classroom! Leary was

¹"Hallucinogenic Drug Cult," p. 35.

²Ibid.

traveling around in the interests of I. F. I. F. (The International Foundation for Internal Freedom) which he and Dr. Alpert had established in 1962. The Zihuatanejo reserach center was closed down by the Mexican government on the grounds that they had entered the country as tourists and were engaged in unauthorized activity. The I. F. I. F. has been changed to the Castalia Foundation which operates on a week end basis with each participant paying \$60 per week end!

Dr. Leary accuses psychiatrists of being behind the times and interested only in mental illness.¹ Drs. Leary and Alpert are not interested in medical research, but in artistic, creative thought brought about by the "expanded consciousness." Most churchmen are duly skeptical about the validity of the religious experiences induced by the drugs. Most psychiatrists fear the side effects of the drugs. But many who have taken the drugs are grateful for the insight gained by their experience.² Thus the question stands: Are hallucinogens a key to the door of greater human perception of aesthetic and aesthetic values? Perhaps the Castalia Foundation will affirm this question or die out as a fad of mystical eggheads.

¹"LSD and All That," p. 74.

²"Instant Mysticism," p. 87.

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