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LSD: An Analysis of the Literature Concerning its Use in the Therapy of Alcoholism

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LSD:
AN ANALYSIS OF THE LITERATURE CONCERNING ITS USE IN THE THERAPY OF ALCOHOLISM

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It will be the concern of this paper to explore the use of the chemical d-lysergic acid diethylamide-25 in therapeutic regimes for alcoholics. Included in this will be the reasons for experimenting with alcoholics, some types and results of experiments with LSD, the indications and limitations of these results, and the treatment of some theories on how LSD acts to help the alcoholic.

The limitations of this study have been great for several reasons. Without a primary experience with either the drug itself or the research, it was necessary to depend on research reports and analyses of the research to obtain information. Much of the research information is unavailable except to other researchers, the quality and comprehensiveness of research reports obtainable were inconsistent, and the understanding of how LSD works is largely a matter of conjecture at this point. Thus, in several places unresolved conflicts will be presented.

Since the first synthesis of LSD in 1938, it has furnished a source of amazement to scientists. Not being the first drug to precipitate great alterations of consciousness, its potency even in minute doses has been largely the root of its prominence. The minimum dose producing recognizable effects is 25 micrograms for an adult. The chemical which startled Dr. Albert Hoffmann, who initially ingested it in 1943, has become one of the most contro-

versial drugs in use today. In the interval, psychiatric researchers, as well as young people seeking new experiences, have observed and experienced astounding psychic and sensory results. The drug which has been widely condemned for precipitating acute psychotic conditions has, under controlled situations, demonstrated benefits in the treatment of some psychiatric disorders.

As a result of the LSD controversy, Sandoz, Incorporated, its only manufacturer, halted production and turned over its stock to the National Institute of Mental Health, which remains the only legal source in the United States. To obtain the drug for experimentation, psychiatric researchers must first submit for approval to the Institute elaborate plans for the experimental program. Currently, about six United States laboratories are involved in LSD research while studies are also being conducted in Canada.

Dr. Humphrey Osmond reported the first study of LSD for therapy of alcoholics as early as 1957 in Saskatchewan, Canada.[1] Alcoholics provided a good group for study for the original research because no other effective treatment had been found for them, and persons exhibiting this symptom were not the favorite patients of medical practitioners.[2] An effective therapy was needed because of the far-reaching social disorganizational effects of alcoholism.

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[1]J. Ross MacLean, D. C. Byrne, P. Ultan, and A. M. Hubbard, "The Use of LSD-25 in the Treatment of Alcoholism and Other Psychiatric Problems," Quarterly Journal of Studies on Alcohol, 22:1:34-45, (March, 1961).

[2]Duncan B. Blewett, "The Psychedelic Drugs in Psychological Research," apparently unpublished paper received from author August, 1966, pp. 49-59.

In 1964 the United States alone had 5,000,000 medically diagnosed alcoholics with the number increasing rapidly and with a low 4% recovery rate, stunted partially from the difficulty in maintaining long term therapy.[3] Studying alcoholics had one other advantage--the results could be measured objectively by the change in drinking pattern after treatment. These elements of alcoholism provided a starting point for LSD research.

But there were aspects, other than social, medical, and research, about the alcoholic himself, which made him amenable to therapy with LSD. Perhaps as important as any aspect are the reasons for which the person degenerated into alcoholism: to fill an emptiness, to decrease the restraint of unwanted controls, and to obtain the drink's social values of cheer and friendliness.[4]

An experience with LSD helps many alcoholics to develop self-acceptance, destroying the emptiness; acceptance of social controls, ending the need to decrease their restraints; and through self-acceptance to relate more effectively to other people, thus gaining the feelings of cheerfulness and friendliness without a drink. But a new set of concepts about one's self and society are essential for this acceptance of self and society.

> A large number of alcoholic subjects learn concepts and ideas in a few minutes that they had not grasped for years. These are termed flashes of inspiration or insight but they seem to me to be the acquisition of new concepts... Memory after the event is usually extremely good and insights learned are never forgotten even if they are not

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[3]Sidney Cohen, The Beyond Within (New York, Atheneum, 1964), p. 202.

[4]Ibid., p. 203.

always used.[5]

Some of these insights, although not always specific, have been revealed as some alcoholics voiced reasons why they were able to resist alcohol after taking LSD. "I realized I was not as bad as I thought...I realized what my drinking was doing to my wife... I now find I understand the A.A.[6] program...I saw God...I was revolted with what I saw in myself."[7]

Although the delirium tremens experience generally does not reverse the drinking pattern, the LSD experience, which can resemble DT's for some, generally alters the pattern.[8] An example of this is an alcoholic who quit drinking cold after having LSD, "I saw myself and all the worms and I died and I knew everything was different."[9]

Another aspect is that the alcoholic must hit bottom before it is possible for him to improve.[10] In LSD his internal defenses are taken from him, and he is forced to see himself as he is.[11]

Even today, more LSD research is conducted with alcoholics than any other group. Generally, alcoholics require as much as twice the amount of LSD needed by other persons to have a psy-

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[5]Abram Hoffer, "LSD: A Review of its Present Status," Clinical Pharmacology and Therapeutics, 6 (March-April, 1965), p. 207.

[6]Alcoholics Anonymous.

[7]Hoffer, Ibid., p. 238.

[8]Cohen, Beyond Within, p. 77.

[9]John Cashman, The LSD Story, (Greenwich, Connecticut, Fawcett Publishers, Inc., 1966), p. 7.

[10]Cohen, Beyond Within, p. 204.

[11]B. B. Blewett, LSD--A Therapeutic Rationale, (Paper delivered at 63rd Annual NAAAP Meeting, Bismarck, North Dakota, 1962), p. 6.

chedelic experience.[12] While the normal dose is 100 micrograms, 200-600 is not unusual to be sure to lower the resistance of all defense barriers as the use of alcohol seems to build up a tolerance to LSD. "It appears that both personality and situation are as substantial determinants of the reaction to alcohol as they are to LSD."[13] Perhaps this is what makes it seem that drug addicts and alcoholics are better able than others to handle the LSD experience.[14]

Each therapist who has used LSD has a different method and a different outlook on the worth of intensive preparation for the experience, guidance during the experience, and control groups. But there is a reasonable consensus that LSD is of value in treating alcoholics and that a certain amount of subject control is necessary. In conjunction with the latter, Dr. Sidney Cohen[15] has offered three precautions: screen the subjects carefully to eliminate any prepsychotics, maintain observation and control during the experience, and supervise the subjects after the experiment.[16]

Although Doctors Jensen's[17] and MacLean's[18] groups had about

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[12]Hoffer, Ibid., p. 186.

[13]Gerald J. Sarwer-Foner, ed., The Dynamics of Psychiatric Drug Therapy, (Springfield, Charles C. Thomas, 1960), p. 311.

[14]Hoffer, Ibid., p. 197.

[15]Chief, Psychosomatic Service, Wadsworth V. A. Hospital, Los Angeles, California.

[16]Hoffer, Ibid., p. 193.

[17]Sven E., Director, York County Mental Health Clinic, Newmarket, Ontario, Canada.

[18]J. Ross, Medical Director, Hollywood Hospital, New Westminster, British Columbia.

the most controlled programs, even theirs were quite different. Jensen conducted a pilot project[19] for incorporating LSD therapy into the treatment of alcoholics in the admission ward of a psychiatric hospital utilizing the principles of Alcoholics Anonymous. Other therapies included: occupational, two hours of group psychotherapy which was superficial and educational, three weekly A. A. meetings, and bimonthly movies with discussion. Near the end of the three weeks 200 gamma of LSD was given.

His follow-up continued for six to 18 months for the 58 subjects. At the time of his final analysis, 38 demonstrated abstinence, seven improved, 13 were unimproved, and seven were lost to follow-up. In a control group of 35 having had the same therapies except for LSD, only four were abstinent, four improved, nine unimproved, and 18 lost. The results from the 45 controls having individual psychotherapy with other therapists and without LSD showed seven abstinent, three improved, 12 unimproved and 23 lost. This seemingly showed a definite advantage of the LSD program over the other two.

But Jensen's study has been criticized on two points:[20] his assignment of treatment groups has been suspected of bias, and all of the subjects lost to follow-up were not necessarily failures. With these factors taken into account, the comparison of treatment regimes could be quite erroneous.

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[19]Sven E. Jensen, "A Treatment Program for Alcoholics in a Mental Hospital," Quarterly Journal of Studies on Alcohol, 23 (June, 1962), p. 320.

[20]Sanford M. Unger, "Mescaline, LSD, Psilobycin and Personality Change," Psychiatry, 26 (May, 1963), p. 122.

MacLean's research group concentrated on a more intensive individual preparation for their subjects.[21] All LSD candidates were required to write an autobiography and give a psychiatric history. For two days prior to the LSD experiment, they attended several sessions with the therapist placing an emphasis on understanding barriers to LSD within oneself, and, immediately prior to LSD, a half hour discussion of the "typical" experience.

A group of four would remain with the subject during the LSD experience to provide stability and different personalities with whom to identify. These would include a psychiatrist, a psychologist, a psychiatric nurse, and a music therapist. None of the observers would take LSD in order to prevent distraction of the patient or projection of the therapists' views upon him. This would also facilitate objective observation and modification of approaches as indicated.

In a quiet, tastefully decorated room, surrounded by his therapists, the subject ingested 400-1500 gamma of LSD. Lower dosages were utilized if he were close to self-acceptance, and higher if a reluctance to let go of reality caused anxiety.

Observations and a complete transcript revealed a peak effect occurring two and a half to four hours after ingestion. The subject would undergo self-scrutiny, later conceptualizing as the therapists remained nondirective. After the drug effects had subsided, a counselor was available until bedtime so there was no need to terminate the effect with other drugs. The therapist conducted another interview in the morning. And in the weeks

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[21] MacLean, Ibid., pp. 35-45.

following the subjects were encouraged to review the experience alone or with the therapist.

Subjects were followed for three to 18 months to determine experimental results. Of four alcoholics demonstrating no complications three were much improved and the other was improved. None of the four subjects sustaining chronic brain damage exhibited any change. Of 11 sociopathic alcoholics, seven showed improvement and the other four no change. In the 42 cases complicated by character trait disturbances, 27 were much improved, eight improved, and seven showed no change.

This follow-up was based on a time-indexed record of the post treatment counseling, the patient's description of the experience written the following day, and psychiatric post-treatment impressions. Also considered were notes from interviews at one week and three months; a psychedelic rating[22] scored at one day and three months, a questionnaire at six months, and an interview and therapist appraisal at one year.

It is interesting to note that the histories of MacLean's subjects revealed an average period of uncontrolled drinking of 14.36 years. Fifty-nine of the 61 had had a case of delirium tremens, 36 had failed with A. A., and they showed an average hospital admission rate for alcoholism of 8.07 times in the past three years.[23]

A notable strength of MacLean's research report was his

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[22]Devised by Dr. D. B. Blewett in "Report No. 3 to the Saskatchewan Committee on Schizophrenia Research on Model Psychoses and Psychedelics," (November, 1958).

[23]Unger, Ibid., p. 121.

statement of evaluative definitions. He considered "much improved" to signify complete abstinence or a great improvement over the previous 12 months. Abstinence could include those that tested the treatment once but did not continue drinking afterwards. "Improved" indicated a definite reduction of intake as compared to the previous 12 months. "Unchanged" meant simply that or included those who demonstrated a transient improvement before resuming the previous drinking pattern.

The Spring Grove State Hospital experimenters[24] used much the same program as the others. But they also utilized testing and investigation of the severity of personality disturbance through interviews and psychological tests before they subjected a person to the LSD experience. The film The Spring Grove Experiment: CBS Reports, which has been made on segments of their research, revealed a very directive approach being used by the therapist while LSD was in effect.

Dr. Samuel Unger[25] has written that he has heard of many reports of complete abstinence of an alcoholic following an isolated dose of LSD without concomitant therapy of any kind.[26] The four preceding examples give a representative sampling of the wide divergence of techniques utilizing LSD in the therapy of alcoholics.

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[24]Spring Grove, Maryland, Dr. A. A. Kurland, Director of Research for NIMH research project, in charge.

[25]Research Psychologist, Laboratory of Psychology, NIMH.

[26]Unger, Ibid., p. 112.

If the methods have been varied, the general impressions of the results have not; they are overwhelmingly positive. Dr. D. B. Blewett[27] in an unpublished, undated paper stated, "All of the half-dozen studies done on the therapeutic effectiveness of LSD in alcoholism have reported recovery rates ranging from 50 to 80%--from five to eight times the effectiveness of any other treatment."[28] In his review of LSD's current status, Dr. Abram Hoffer[29] summarized that the combined results of several therapists revealed 128 subjects much improved, 44 improved, and 73 unchanged where LSD was used as an adjuvant to the therapy of alcoholics and that no studies with comparable settings were negative to its value.[30] Furthermore, the Bureau of Alcoholism in Saskatchewan felt that the results were outstanding and that LSD would eventually become a standard treatment method where indicated.[31]

However, in specific instances the appraisal of results has not been so dramatically positive. Dr. Charles Savage[32] described a paranoid alcoholic who would not admit his drinking problem until he received LSD, at which time he divulged his entire history

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[27]Supervisory Psychologist, Psychiatric Services, Department of Public Health, Saskatchewan.

[28]Duncan B. Blewett, "New Horizons in Motivation and Insight," unpublished paper,

[29]Psychiatric Research Director, Psychiatric Services Branch, Department of Public Health, Saskatchewan, and University of Saskatchewan.

[30]Hoffer, Ibid., p. 221.

[31]"Apparent Results of Referrals of Alcoholics for LSD Therapy," Interim Report of the Bureau on Alcoholism, Saskatchewan Department of Public Health, Regina, Saskatchewan, Canada, December, 1962, p. 5.

[32]Research Psychologist, Laboratory of Psychology, NIMH.

to Dr. Savage. But, following the experience he became more suspicious, demanding, and paranoid and refused to see the therapist.[33] The selection of this patient as a candidate for LSD seems somewhat of an oddity since paranoia has been frequently accepted as a contraindication to LSD therapy.[34]

A recent issue of Psychiatric Progress contains an article describing an experiment with LSD given to psychopaths, a notoriously rigid group.

> The responders "showed more improvement in the areas of sexual behavior and excessive use of alcohol or drugs" the investigator said. Their school, home, or job performance was considerably improved at six months follow-up, but improvement "had largely vanished by the 12 month period," he noted. Others seemed to show an increasing improvement from time of treatment through 12-month follow-up.[35]

The question presents itself as why this set of results should differ from more positive ones. Perhaps the follow-up in other research has been neither long nor comprehensive enough. Another possibility is that LSD is not the treatment indicated where psychopathic complications exist. Considering that psychopaths tend to avoid involvement with other people and accepted mores and philosophies, this thesis would be supported by Hoffer's statement that the best results from LSD therapy are associated with a strong emotional response.[36]

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[33]Charles Savage, "The Resolution and Subsequent Remobilization of Resistance by LSD in Psychotherapy," Journal of Nervous and Mental Disease, 125 (July-September, 1957), pp. 434-5.

[34]Hoffer, Ibid., p. 195.

[35]"Insightful Response to LSD Found in Selective Groups," Psychiatric Progress, (September-October, 1966), p. 2.

[36]Hoffer, Ibid., p. 238.

The research results seem to indicate that LSD has value in the therapy of some alcoholics and that it is quite well accepted by many of its researchers. However,
essary before any valid generalizations can be made because of the limitations of the research. First, of the large number of alcoholics in the United States and Canada, 245 experimental subjects hardly represent a comprehensive sample. Secondly, not all of the studies have been well controlled for screening and categorization of subjects or for follow-up.

So far nothing has been done in an attempt to evaluate individual methods or the implications of various methods in relation to various personality types or the complications of alcoholism. Perhaps this is because investigators are too subjective about their own techniques or biased toward LSD in general.

No provision has been made for opposing observations or opinions. For instance, one researcher contends that double blind studies are not feasible since the investigator would recognize a drug which was very much different from LSD and the same type of drug would give the same results.[37] Dr. Dittman[38] believes a similar enough drug can be given that the investigator would not recognize the substitution, but the effect would be different.[39]

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[37]J. N. Sherwood, M. J. Stolaroff, and W. W. Harman, The Psychedelic Experience--A New Concept in Psychotherapy, (Regina, Saskatchewan, Bureau on Alcoholism, Health and Welfare Building, December, 1962), p. 5.

[38]Director of the Neuropsychiatric Institute, University of California, Los Angeles, California.

[39]Keith Dittman, "LSD--Potentials and Problems," February 16, 1967, Memorial Center, Illinois Wesleyan University, Bloomington, Illinois.

Another example of this is that some investigators have watched prosperous, responsible persons become so engrossed in personal sensations that they lost their concern with productivity.[40] The contrast to this, stated by Dr. Dittman, is that the founder of Synanon only conceived of the idea for this organization immediately after an experience with LSD.[41]

Ever present are the limitations of any psychological research: the inaccuracy of measurement of effects, the psychological state of the subject at the time of the experiment, the subject's previous value system, the completely subjective response of the subject, and the tendency toward subjectivity on the part of the experimenter. The therapist tends to project his ideas on the subject so that under LSD the fondest theories of the therapist are confirmed.[42]

A further emphasis of the subjectivity of LSD research can be found in this statement.

> Sullivan stressed that in psychotherapy a drug can be therapeutic only by altering the relationship between the patient and the doctor. By establishing a changed relationship with the doctor, the patient has the possibility of changing his relationship to other people in a manner which is more satisfying to him. If mescaline and LSD act therapeutically, they do so by favorably altering a relationship. But let us remember that while a relationship may be altered in a favorable direction, it is not necessarily permanent. The direction can always be reversed, particularly if the relationship moves too fast.[43]

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[40]Jules Saltman, What We Can Do About Drug Abuse, (New York, Public Affairs Committee, Inc., 1966), p. 9.

[41]Dittman, Ibid.

[42]Cohen, Beyond Within, p. 182

[43]Savage, p. 434.

Theories on the way in which LSD acts have been synthesized from observations of persons undergoing the LSD experience and their subsequent behavior modification as well as from physiological studies on animals. In order to understand the observational theories, it is imperative to have some sort of information on the nature of the experience.

The height of the experience occurs between two and one half and four hours after ingestion of the drug, and the effects generally last eight to 12 hours. Induction is gradual, and almost any mood change may be experienced.[44] Although reactions are highly individualized to each experience, certain manifestations frame the basic outline and deviation point for each experience. Kinesthesia is affected by an altered awareness of gravity, a feeling that extremities have no weight, and possibly the assumption of catatonic-like postures. Along with this an unawareness of body image and a sensation of floating may occur.

Several thought disturbances are characteristic. These include distortion of time sense, impairment of concentration, memory distortion, and a decreased significance of new associations. As for thought content: major thoughts depend on past life experiences; ideas may be delusional, bizarre, even paranoid; or they lack motivation. Performance on most mental tests is impaired, although it has been conjectured that LSD may facilitate learning. There is no increase in creativity, per se, only in sensitivity.[45]

Generally, consciousness and orientation are not dis-

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[44]Hoffer, Ibid., p. 208.

[45]Ibid., p. 209.

turbed,[46] although at the height of the experience the unconscious typically hallucinations or a reliving of memories. This is frequently a basis for a catharsis of repressed material and emotional release through a scream or cry, generally accompanied by a desire for human contact.[47]

Sensory perception is the most affected. Vision with open eyes may admit a blur, flutter, changed color perception or interpretation, alteration of normal light intensity, unusual interpretations of objects' significance, familiar objects. There may also be an altered size or shape of a room, flattened and distorted faces, pulsation or glow of inanimate objects, or the appearance of halos. Frequently with the eyes closed, the LSD adventurer sees brilliantly colored lights and objects in curious geometric patterns, religious scenes with jewels, cathedrals, or palaces.[48]

Changes in other sensory modalities are less common. Most typical is the phenomenon of synesthesia or the crossover of sensation from one sense modality to another. Auditory manifestations, varying inversely with the dosage, take the forms of acuity alteration with an inability to localize sound, an enthrallment by music, or of sound as a visual experience. Taste may be flat, of a pecu-

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[46]Max Rinkel, ed., Chemical Concepts of Psychosis, (New York, McDowell, Obolensky, 1958), p. 80.

[47]R. A. Sandison, A. M. Spencer, and J. D. A. Whitelaw, "The Therapeutic Value of Lysergic Acid Diethylamide in Mental Illness," Journal of Mental Science, 100 (April, 1954), p. 493.

[48]Joseph R. DiPalma, "LSD: Its Use and Abuse," RN, 28 (July, 1965), p. 62.

[49]Cohen, Beyond Within, p. 51.

liar new variety, or of an unusual texture. Tactile sense often reveals a temperature distortion, a coarse, heavy heat of clothes, or a feeling of grease or dirt on a familiar surface.[50]

Physiologically, there is an increased motor tone and locomotor activity, stimulation of respiration, mydriasis, blood pressure elevation, tachycardia, and hyperthermia.[51]

Due to a multitude of variables influencing the quality and/or intensity of the experience, it varies with each time and person. Females and less educated, less intellectualizing people tend to have a more severe reaction.[52] Flexibility, self-acceptance, and the presence of others of a common culture lessen the reaction.[53] Other factors include personality, body type, vocation, age, health status, motivation for taking LSD, previous experience with hallucinogens or psychiatric treatment, premedication, the setting, and the attitude and experience of the therapist.[54]

Two things require mention in emphasis of the latter. Dr. Cohen has stated that the subject's reaction to LSD therapy is very dependent on the therapist's opinion of it.[55] Also:

> If any complications arise during the experience, they are probably caused by the inexperience or incompetence of the therapist. Complications may arise because the experience produces great confusion, or panxiety. The therapist must be able to anticipate

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[50] Ibid., p. 62.

[51] Rinkel, Ibid., p. 192.

[52] Sarwer-Foner, Ibid., p. 301.

[53] Ibid., p. 306.

[54] Hoffer, Ibid., pp. 196-199.

[55] Ibid., p. 192.

> these changes and take proper remedial action. These reactions do not come abruptly and in nearly every case the subject has indicated in many ways what will probably happen.[56]

Within the setting itself are very important variables. Groups of subjects tend to differ from individuals. They generally tend to have less unpleasant and more elated experiences, and tend to be more friendly to other group members and more hostile to the experimenter.[57] These effects of the group are qualitative rather than quantitative.[58] Assigned tasks often increase the reaction whereas those chosen by the subject decrease it.[59] Also predisposing a severe reaction is a rigid research design which neglects the subject as an emotive being.[60]

But what does all this mean for the subject taking LSD? Ideally, he will be able to control the psychic images so that he can explore his mind and reproduce the situation later.[61] This placement of the prime responsibility upon the subject should stimulate a revelation of his own resources, thus reducing transference or dependency on the therapist.[62]

A concept which provides a basis for clinical conjectures concerning the working of LSD is that reality and self concepts are based on sensory experience. When this is altered, either panic

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[56] Ibid., p. 193.

[57] Sarwer-Foner, Ibid., p. 302.

[58] Ibid., p. 75.

[59] Ibid., p. 304.

[60] Ibid., p. 306.

[61] Sandison, Ibid., p. 493.

[62] Sherwood, Ibid., p. 3.

may ensue or the defense of rationalization may be removed allowing for increased insight and awareness and different reference frames. This latter permits the evolution of a therapeutic value.[63]

The possibility of panic is one of the main reasons for suggesting that paranoia be a contraindicating factor. Also, the removal of rationalization demands a frightening self-scrutiny which can lead either to anxieties from a struggle to maintain old defenses or to a new concept of self and reality.[64] Universal symbols are often used as subjects of transference to help develop in the person new reference values and integrate ideas.[65] Once the new self concept is developed, the reduction of faulty and excessive uses of defense mechanisms should ensue.[66]

A slight variation of this theory is based on a five year study at New York University's Research Center for Mental Health that "showed that the basic character of the subject is intensified under LSD."[67] With this belief, a therapist can guide the patient toward death and rebirth experiences to reconstruct the character; and once the patient rids old conflicts of their meaning, he can deal with them repeatedly until emotional response ceases.[68] In accord with this theory, the philosophy of the

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[63] MacLean, Ibid., p. 42.

[64] Blewett, Therapeutic Rationale, p. 6.

[65] MacLean, Ibid., p. 43.

[66] Ibid., p. 43.

[67] Cashman, Ibid., p. 12.

[68] Cohen, Beyond Within, pp. 192-198.

therapy is that self understanding seems to lead to self acceptance, and to love and acceptance of others.[69]

Physiological studies have been performed on animals--particularly cats, rabbits, and rats--to determine the chemical effects of LSD in the body, its distribution and excretion. The distribution is the most unexpected: only a small percentage of LSD reaches the brain, and it is practically vanished from all systems in one to two hours.[70] Studies at the University of Rochester, utilizing a radioactive form, showed that, within minutes after administration, concentration occurred in the stomach, liver, and kidneys--not the brain.[71] The first is important since it explains the transient gastric distress sometimes occurring in one half to two hours after ingestion.

Hepatic concentration has two considerations. First, LSD's detoxification in this organ would tend to mark liver damage as a contraindication to its use. But LSD has been tolerated without side effects by Skid Row alcoholics having cirrhosis.[72] Perhaps, only little function must be present to detoxify LSD, or it is not in actuality detoxified in the liver. Secondly, hepatic excretions of LSD are in an inactive form which has lead to the conjecture that LSD is only the triggering mechanism for the reactions which it precipitates.[73] Apparently no conjectures have been made con-

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[69]Blewett, Therapeutic Rationale, p. 8.

[70]Rinkel, Ibid., p. 64.

[71]Cashman, Ibid., p. 36.

[72]Sidney Cohen, "Lysergic Acid Diethylamide: Side Effects and Complications," Journal of Nervous and Mental Disease, 130 (January, 1960), p. 37.

[73]Rinkel, Ibid., p. 64.

cerning the significance of the renal accumulation.

One of the most specific theories on its action concerns a conjecture that LSD affects the diencephalon which controls emotional responsivity, awareness, and the autonomic centers. Thus, the action is within the tracts where sensory information is filtered, compared, and matched.[74] This is supported by clinical manifestations of autonomic system disturbances preceding mental phenomena,[75] altered levels of awareness, and a decrease of inhibition in emotional responses.

Two other theories are also popular. First, that LSD directly or indirectly affects serotonin activity,[76] and that this change of serotonin in the brain affects mental processes similar to the changes found in mental illness.[77] However, it has been conjectured by others that LSD affects serotonin peripherally rather than centrally.[78] Finally, there is some belief that LSD interferes with nerve impulse transfer by neutralizing neurohumors that conduct impulses over synapses.[79]

In summary, LSD has been the subject of much dispute concerning legal controls, its dangers, benefits, the most therapeutic method of use, and its method of action. It would almost seem that the controversy about LSD stems as much from what is not known about it as from what is known.

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[74]Cohen, Beyond Within, p. 36.

[75]Rinkel, Ibid., p. 79.

[76]Cashman, Ibid., p. 37.

[77]Rinkel, Ibid., p. 188.

[78]Ibid., p. 66.

[79]Cashman, Ibid., p. 37.

Every therapist who has used LSD has a different impression of how to use it and how it works, but seemingly, as long as the therapist is enthusiastic about the drug, it will produce desirable effects in the majority of his patients. Clinical and physiological researchers have attempted to describe its method of action to explain its effects, but the physiological research has been done with animals and psychological with humans. What research has been performed is scant and poorly correlated, but most researchers feel that the drug has value and merits much more intense consideration.

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