

LONG-LASTING EFFECTS OF LSD ON CERTAIN ATTITUDES IN NORMALS:
AN EXPERIMENTAL PROPOSAL

William H. McGlothlin

May 1962

P-2575

PREFACE

This paper, prepared in preprint form by The RAND Corporation as a courtesy to the author, describes a research proposal which he is interested in having evaluated and commented upon. Owing to the nature of the work envisioned, the proposal has been viewed as not falling within the scope of research normally undertaken by the Corporation and the author is being encouraged to seek interest and support elsewhere.

SUMMARY

This Paper advocates the conduct of research into the long-lasting effects of administering d-lysergic acid diethylamide (LSD) to normals. In addition to its use in psychotherapy, there have been some reports of experimental subjects who claim lasting beneficial effects attributable to the LSD experience. In particular, two follow-up questionnaire studies indicate that normal subjects frequently claim changes in personality resulting from only one or two administrations of LSD, and these claims are maintained after periods of a year or more. These results are subject to the weaknesses of the questionnaire method; but, when considered along with some of the literature on the use of LSD in psychotherapy, they appear to be sufficiently suggestive to warrant more controlled experiments in this area.

An experiment is suggested here which would attempt to measure any long-lasting changes in attitudes, values, and communicative ability resulting from the administration of LSD. In particular, the measures would concentrate on changes in closed-mindedness as reflected by scales of dogmatism, opinionation, and ethnocentricity. A sample of about 100 subjects would be chosen from a larger population on the basis of high scores on the above traits. They would also be given certain performance tests which have been found to be related to dogmatism, and their ability to communicate with persons holding views opposite to their own would be measured in discussion sessions. They would then be equally divided into matched experimental and control groups with the former receiving two LSD sessions. One portion of the control group would receive dexedrine instead of LSD and the other would receive no drug or placebo sessions. The experimental and control groups

would then be retested with the above measures at post-drug periods up to twelve months. The method of subject preparation and conduct of the LSD session are discussed in detail in the text.

In addition to the research project and the supporting data, the Paper provides a brief history of LSD-like drugs along with a description of some of the more frequent phenomena experienced under their effect.

ACKNOWLEDGMENTS

I was fortunate in obtaining interviews with several persons in this area who have had wide experience in the use of d-lysergic acid diethylamide (LSD). They are Dr. Sidney Cohen of the Veterans Administration; Dr. Keith Ditman and John Whittlesey of the Alcoholism Research Clinic at the UCLA Medical Center; and Dr. Betty Eisner, Dr. Oscar Janiger, and Dr. S. M. Wesley, all in private practice. Together, they have administered LSD to some 600 therapy patients and 1100 experimental subjects. That portion of the research proposal treating the preparation of subjects and the conduct of the LSD session is largely based on their recommendations. I should like to thank them for their valuable help and for reading the draft of this paper.

I especially thank Dr. Janiger for allowing me to extract data from the LSD follow-up questionnaires contained in his files, and Drs. Ditman and Hayman for making their unpublished manuscript available to me.

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William H. McGlothlin*

The RAND Corporation, Santa Monica, California

I. INTRODUCTION

During the past ten years several hundred studies have been published on the effects of administering d-lysergic acid diethylamide (LSD) to human subjects. They can be roughly divided into those examining the drug effects during the 4-6 hours following its administration, and those concerned with long-lasting therapeutic effects in patients. The latter have generally used LSD as an adjunct to non-drug therapy, but some have reported strongly positive results from a large single dose, with very little additional therapy. The reported success in treating alcoholism is particularly impressive in view of the objective criteria of improvement.

Occasionally, the non-therapy experimental studies report that some of their subjects claim lasting beneficial effects resulting from the LSD experience, although there was no therapeutic intent in the experiment. Two of these investigators have administered follow-up questionnaires at post-LSD periods up to three years. A surprisingly high percentage of the subjects claimed changes in various aspects of their personalities and behavior attributable to LSD. The majority felt it gave them better understanding of themselves and others, and a high proportion also claimed better inter-personal relationships, more tolerance of others and their viewpoints, and changes of values in several areas. The weaknesses of the questionnaire

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method should be considered in evaluating these results; however, they appear to be sufficiently suggestive to warrant more controlled experiments in this area.

The research project advocated here attempts to provide such an experiment, intended to measure both subjective and behavioral changes, if any, occurring as a result of the administration of LSD to normals. More specifically, the experiment would test the hypothesis that persons scoring high on scales of dogmatism, opinionation, and ethnocentricity prior to LSD can be shown to exhibit significant decreases in these traits at post-LSD periods up to twelve months, and that the resulting increased communicative ability between opposing factions can be measured in discussion sessions.

The next two sections provide a brief history of LSD-like drugs and a description of some of the more frequent phenomena experienced while under the effect of LSD. They are included for the benefit of the reader who is not familiar with this subject; others may wish to go immediately to the following section, which presents a summary of the above-mentioned LSD follow-up questionnaire results, and a brief review of the literature on its use in psychotherapy. Some hypotheses as to modes of action of this type of drugs are discussed, and the final section describes the suggested research project.

II. HISTORY

The drugs of interest to this Memorandum have been most commonly referred to as hallucinogens. While it is true that one of their most characteristic features is the producing of striking and colorful mental pictures or visions, these drugs are more accurately described as illusiogens, since only very rarely do subjects interpret the visions as real, as is the case in true hallucinatory states. They have also been called psychotomimetic or psychogenic agents, referring to the fact that some of the symptoms produced are similar to some reactions occurring in the natural psychoses. Since the range of mental phenomena stimulated by these drugs is much wider than illusions or the mimicking of psychosis, Osmond (41) has proposed the term "psychedelic," which means "mind manifesting."

A very large number of drugs will produce marked mental changes when given in sufficiently large quantities. Osmond has attempted to limit psychedelic drugs "to substances that produce changes in thought, perception, mood, and sometimes posture, occurring alone or in concert, without causing either major changes in the autonomic nervous system or addictive craving, and although, with overdosage, disorientation, memory disturbance, stupor and even narcosis may occur, these reactions are not characteristic." This definition excludes anesthetics, hypnotics, alcohol, and derivatives of morphine and cocaine.

The recorded history of the use of these drugs is very long and, according to Janiger, (31) begins with soma, an extract from a now unknown plant, which was used in early India and Iran.

Marihuana (hashish), from the Indian hemp Cannabis sativa, is of almost equal antiquity, being well known in China in 2700 B.C. (59). From the

beginning, it was regarded with mixed feelings, being labeled "liberator of sin" and later called a "delight giver." "The tolerant Hindus termed it 'the heavenly guide' and 'the soother of grief.'" (15). Use of hashish was primarily confined to Asia until the nineteenth century, when it was introduced in Europe. Descriptions of its effects were recorded by such noted literary figures as Baudelaire, Dumas, and Gautier. In the United States, marihuana has generally been regarded as a menace to society, although some objective studies have found its dangers to be grossly overrated (39).

When the Spaniards invaded Mexico, they found the native Indians using three plants called ololiuqui, teonanacatl, and peyotl in various religious rituals. In the first, the seeds contain the active chemical; the second is the "sacred mushroom"; the third, and best known, is from a small cactus whose active ingredient is mescaline. With characteristic Western intolerance, the Spanish immediately set about eliminating the use of these plants without investigating their properties. The Indians were not easily dissuaded, however, and continued to conduct their secret, vision-producing rituals even after they were Christianized. The sacramental use of peyotl is presently incorporated in the ritual of the Native American Church, and is widely used among the Indians of both Mexico and the United States. Several investigations, including a congressional hearing, have been conducted in this country in attempts to outlaw this ritualized use of peyotl. They have been singularly unsuccessful in proving that its use in this manner is detrimental, but rather have turned up considerable evidence that it is a most effective combatant of alcoholism--one of the several scourges the Indian inherited from the white man (53, 56).*

*A social study of the effects of the ritualized use of peyotl in Indian cultures would be a valuable complement to the controlled research advocated later in this Memorandum.

The effects of peyotl attracted some early scientific investigations, including those of Weir Mitchell (40), Havelock Ellis (20, 21), and Heinrich Kluver (33), who described their drug-induced sensations in great detail. Sometime later, chemists found the active ingredient of peyotl to be mescaline and were able to synthesize it. Synthetic mescaline has a distinct advantage over the peyotl cactus buttons in that it is less likely to produce the side effect of nausea, a characteristic of the latter.

Recently, some of the mental effects produced by mescaline have become more widely known through Aldous Huxley's Doors of Perception (27). There have also been a number of experimental investigations of its use in psychotherapy (13) and in the study of creativity (36, 61). However, it was not until the discovery of LSD some twenty years ago that this particular line of research received a real impetus.

A number of lesser-known preparations are made from various plants and used by primitive people in several parts of the world to produce effects similar to those of mescaline. Some of these are caapi, yage, cohoba, fly agaric, and iboga.

III. THE LSD EXPERIENCE

LSD was partially synthesized in 1938 by the Swiss chemists, Stoll and Hofmann (58); its hallucinogenic properties were accidentally discovered by the latter in 1943. Hofmann reports (26) that while working in the laboratory with LSD, he became strangely ill and notes as follows: "I was seized by a peculiar sensation of vertigo and restlessness. Objects, as well as the shape of my associates in the laboratory, appeared to undergo optical changes. I was unable to concentrate on my work. In a dream-like state, I left for home . . . (I) fell into a peculiar state of 'drunkenness' characterized by an exaggerated imagination. With my eyes closed, fantastic pictures of extraordinary plasticity and intensive color seemed to surge towards me. After two hours, this state gradually subsided . . . "

In order to confirm that the LSD had caused his peculiar symptoms, Hofmann later ingested one-fourth of a milligram of LSD, which he felt to be a very small dose, and found his symptoms were of even greater intensity than before. It was later determined that oral dosages of LSD as low as 10-20 micrograms (mcg.) were capable of producing mental changes. Other similar substances, such as mescaline, require dosages more than 10,000 times this amount to produce psychic effects (6).

Since the discovery of its psychic effects in 1943, more than 700 papers have been published on LSD. This unusually wide interest was largely stimulated by hopes of producing a reversible, model psychosis which would be helpful in the study of the normally occurring mental illnesses. The fact that extremely small quantities of LSD may produce psychotic-like hallucinations, plus the additional finding that it was a strong inhibitor of serotonin, one of the neuro-regulatory substances in the central nervous

system, led to new hopes for the discovery of a chemical basis for psychosis. The majority of the LSD literature has had this orientation; however, a number of papers have appeared on the therapeutic use of the drug with psychotics and psychoneurotics.

The physical and mental effects of LSD on human subjects have been described many times in the literature. There is general agreement among experimenters that certain physical and perceptual changes frequently occur; however, there is much less agreement on the occurrence of some of the more profound mental experiences. Some of the early investigators (4, 43) were impressed with the high frequency of paranoid reactions to LSD. Subjects became highly suspicious that various diabolical tricks were being perpetrated on them. Other experimenters have worked with large samples of subjects and reported very few paranoid reactions. Some workers have indicated that the recall and re-experiencing of previously repressed childhood incidents is quite common (22, 38), while others have found such experiences considerably less frequent. Several investigators have observed that those subjects who have religious or mystical experiences under LSD also report a high incidence of lasting beneficial effects (16, 18, 50); however, the percentage of subjects attaining such states varies quite widely among experimenters.

More recently, it has been realized that there are several important variables which help determine the content of the LSD experience. The personality, the defense system, and the motivation of the subject play major roles; the attitude of the experimenter is of almost equal importance. The overly controlled individual, who has a closed mind toward possible psychic experiences outside his familiar frame of reference, is likely to

experience minimal psychic changes and runs a good chance of acute anxiety, nausea, and other unpleasant physical symptoms. The open-minded sceptic, or the person who is interested in using the drug to facilitate personal insight, is more likely to report a pleasant and beneficial experience.

If the person administering the drug is supportive and has himself experienced a wide range of LSD effects, he will tend to allay anxiety on the part of the subject and will substantially increase the probability of attaining a maximum effect. If the experimenter adopts an impersonal probing method, the subject is apt to become acutely anxious and exhibit anger and paranoid reactions. Some investigators have stressed the importance of a pleasant environment with background music and the prevention of intrusions.

Several authors have remarked on the impossible task of communicating the LSD experience to persons who have not experienced it. Janiger writes, "Understanding, at best, derives from the communality of the experience, where feelings and impressions are matched when words have lost their meaning" (30). Cohen remarks, "Any attempt to communicate the total LSD experience will surely fail. Much of it occurs on a non-verbal level and . . . furthermore, it is so foreign to everyday existence that our vocabulary is lacking in words to describe precisely even that which could be described" (11).

Bearing this in mind, I shall nevertheless attempt to provide the reader with some of the components of the experience. LSD is normally given orally following at least four hours of fasting. The dosage reported in the literature has varied from 10-1500 mcg., with the most frequent size being around 1 mcg/kg of body weight. Janiger reports that the psychological effects are reinforced as a function of dose size up to 75-125 mcg. (30). Most investigators have worked with the lower dosages (25-100 mcg.); however, some

report a higher incidence of the more marked psychic effects with dosages of around 200-400 mcg. (9, 37, 57, 64).

Physiological effects are minimal compared with the psychological. Pupillary dilation is the most consistent, and a slight rise in blood pressure is common. Slight increases in body temperature are usually noted with the lower doses (11), while decreases in skin and body temperature were observed at dosages of 8 to 16 mcg/kg of body weight (54). Respiratory and blood chemistry changes are minimal. Nausea is reported fairly frequently, but vomiting is rare except with very high dosages.

About 30 minutes after ingesting LSD the subject normally experiences a feeling of dizziness or intoxication. One of the commonest early emotional reactions is smiling and laughing, which sometimes develops into uncontrolled laughing and/or crying. The subject may report that he is laughing but that he doesn't feel particularly happy. With closed eyes there is a lightening of the normal gray-black expanse and almost invariably colorful and luminous geometric designs appear in the field of vision. They may change into architectural structures which frequently are in very saturated colors and appear to be glowing from an internal light.

With the eyes open numerous perceptual changes are observed. Cohen writes, "An intensification of the beauty and meaning of everyday things can be impressive enough to make one assume that this is how certain artists must have seen commonplace objects. Everything glows with a luminescence of its own and texture becomes three-dimensional. There is a tendency to dwell on the minute, a fleck on the wall, the grain in a piece of wood. Objects develop a significance far beyond their ordinary meaning. The 'breathing' of manifestly inanimate objects is one of the more common

illusions. Flowers open and close before your eyes. Wood paneling goes in and out of focus as though the fine adjustment of a microscope were being manipulated. Misperceptions may be more complex. A face can rapidly alter its expression and appearance so that a succession of changing faces are perceived" (11).

Auditory sensations are also enhanced. Noises which are ordinarily ignored may become very irritating. Music is generally heard in new dimension and with greater appreciation.

Subjects usually report food tastes flat and appetite is generally diminished although marked increases have been noted (54). Intellectual functioning is slightly impaired--one study showing a mean drop of 9 points on I.Q. tests (12). The drop was primarily in the abstract reasoning portion of the test. Subjects typically remain quite alert to their surroundings and fully aware that the phenomena they are experiencing are drug induced. Sleep has been only rarely reported. A very common report is that thoughts appear with an unbelievable rapidity, or that there are lightning shifts in the frame of reference in which an issue is examined (30). Almost invariably the thoughts and visions come in a wave-like fashion. The impression of reliving the experiences of a lifetime in a few moments is sometimes reported.

Many subjects tell of changes in body image or self-concept. They may feel that their feet are far away or one side of the body may appear to be longer than the other. When looking in a mirror the face takes on a wholly different appearance and, on continual staring, changes into a multitude of shapes. A related occurrence is the phenomenon of depersonalization. The person may actually feel physically separated from his body, such that he

sits in the corner of the room and observes himself on the couch. This is very similar to several reports of pilots flying at very high altitudes in which they seem to be outside the cabin looking at the shell of themselves on the inside (32).*

More commonly, instead of a physical depersonalization, the LSD subject will report a greatly enhanced ability to view himself in an unprejudiced and detached position, which enables him to gain important personal insight. He is able to see clearly the mechanisms which prevent such an unvarnished self-picture in the everyday, drug-free state.

Probably the most remarkable LSD experiences are those variously described as mystical, transcendental, or cosmic. They bear a close similarity to the very rarely reported spontaneous mystical experiences described by Huxley and James (28, 29). The naturally occurring ones are almost invariably strongly religious, particularly in the sudden realization of the presence or reality of God. The LSD-induced experiences may be religious in nature, but they are by no means always such, except possibly when religion is interpreted in the broadest sense. The experience is often described as beautiful, pleasant, and integrative--creating a feeling of oneness with the universe; however, it may be a very unpleasant one in which the world appears ugly, drab, and hostile. A frequent description is of a struggle to find one's place in the universe. Sudden visions are often presented in the form of opposites or paradoxes with such impact that their reality defies questioning.

*Murray Geisler suggests that LSD might have some use in conditioning space personnel to the phenomena of depersonalization. In view of pilot experiences and similar results from sensory deprivation experiments, it seems likely that this may present a problem in space travel.

For example, man may be seen as constantly attempting to survive as an individual in an environment where struggle for physical survival is replaced by the seeking of status and possessions which will isolate the "I". Then suddenly the picture changes and the desperate need for companionship appears. He realizes that the struggle to create an island about himself results in loneliness and unhappiness, but he nevertheless seems to be irrevocably committed to this course by a stronger, evolutionary force. This is but one of a seemingly infinite variety of universal-type insights into the nature or meaning of life that are reported. Paradoxically, the subject usually claims that this type of experience was beneficial, regardless of whether he describes it as pleasant or unpleasant. I shall have more to say about this subject in a later section, since it appears that this, together with the achievement of personal insights into one's own behavior, seems to have the most lasting effect--which is the subject of primary interest in this Memorandum.

Another LSD phenomenon which is of interest is the tremendously enhanced sensitivity of the subject to a wide range of non-verbal cues from those around him. Cohen writes "(the LSD subject) can sense the therapist's unspoken feelings with phenomenal accuracy" (10). Subjects often report that they are amazed at their sudden ability to receive these cues after an LSD session. It is as though they had recaptured a facility they had as children which had since been blunted in the adult world.* This feature of the LSD experience is subject to a fairly rapid decrement within a few days, but possibly enough of it is retained to account for the claims of improved social relations which will be discussed in the next section.

*The increased sensitivity to non-verbal cues is also reported by subjects undergoing the intensive group interaction experiments by the Bethel National Training Laboratory.

IV. CLAIMS OF LONG-LASTING CHANGES ATTRIBUTED TO THE LSD EXPERIENCE

EXPERIMENTAL SUBJECTS

The effect of LSD, as described in the previous section, reaches a height in 2 to 4 hours and is essentially over in 12. Almost everyone who takes LSD finds it a fascinating experience for which it is difficult to find adequate superlatives. In one study, 49% of the subjects checked the descriptive statement, "The greatest thing that ever happened to me" (16). Admittedly, then, it is a great experience, but are there any lasting effects such as changes in values, attitudes, communicative ability, and social insight? A number of studies conducted on the use of LSD and mescaline as an adjunct to various forms of psychotherapy have claimed that they are effective in producing such changes, and I shall briefly review this literature in the next sub-section. If proven effective, this would, of course, be an important use; however, for this type of drug to be useful in the present context, we must show indications that (1) it is capable of producing the desired changes in human behavior in itself with, at the most, only minimal additional preparation or therapy, and (2) it is effective with so-called normals, persons who are not patients, actively seeking a cure or solution to their mental and emotional problems. A number of LSD studies have been conducted with normals for various purposes, and some of these have remarked that the participants claimed they had obtained definite lasting benefits from the experience. Rinkel reports that many nurses and other normal subjects who participated in LSD experiments proved more effective in their hospital jobs and reported better adjustment (42). Abramson writes that when LSD was used in group studies (not intended as therapeutic) it led to insight and better adaptive techniques both at work and in community

activities (2). Terrill reports his beginning a study using LSD in personality evaluation; but when his subjects (mainly professional volunteers) so frequently claimed increased feelings of well-being and confidence, as well as lasting insights, the study was broadened to investigate the psychotherapeutic use of the drug with psychiatric patients (60).

Ditman and Hayman conducted an experiment on 87 subjects consisting of both normals and patients (mostly alcoholics) to compare the LSD experience with that of delirium tremens (17). They were impressed by the numerous subsequent claims of benefit from the subjects and decided to administer a lengthy follow-up questionnaire covering social, economic, and psychological areas. The results of the questionnaire, as yet unpublished, are of particular interest to the present subject so I shall report them in summary form here, and in more detail in the Appendix. Three-fourths of the subjects received only a single LSD dose of 100 mcg.; the others had 2-4 doses. Of the 87 subjects, the questionnaires were completed by 74. The interval between administration of LSD and the questionnaire ranged from 6 months to $3\frac{1}{2}$ years. Of the 74 returns, 40 were from patients in some form of psychological or psychiatric treatment, 27 of whom classified themselves as alcoholics. Of the 34 normals, about one-third were psychotherapists.

Improvement in excessive drinking behavior was claimed by 67% of the alcoholic group. On a second questionnaire, administered only to the alcoholics approximately $3\frac{1}{2}$ years after their LSD experience, "about one-third of the 16 returns still claimed abstinence ranging from 1 to $1\frac{1}{2}$ years . . . and three-fourths of these subjects still claimed some lasting benefit (fewer arrests, increased self-understanding and esthetic interest), but none of the subjects had maintained their sobriety to the time of the second questionnaire."

The following results were extracted from the table giving the percentages of claimed improvements attributed to the LSD experience for the 74 respondents.*

| <u>EFFECT</u> | <u>%</u> |
|---|----------|
| Changes noted by the person closest to you (better) | 42 |
| Comfort with people (more) | 37 |
| Changes in "perspective": | |
| Deeper significance to things | 46 |
| Things seem more real | 40 |
| Changes in attitudes: | |
| More tolerant | 40 |
| More accepting of ideas and viewpoints formerly rejected | 38 |
| More broadminded | 37 |
| Less irritable or easily annoyed | 33 |
| Changes in sense of values | 47 |
| Was of temporary benefit | 55 |
| Was of lasting benefit | 50 |
| Gave great understanding into self and others | 54 |

Seventy-two per cent of the respondents described the LSD experience as very pleasant and 66 per cent felt it was an experience of great beauty. In general, the patients tended to claim somewhat greater benefits than did the normals (see Appendix).

In addition to the data shown above, I was fortunately allowed to extract some data out of 194 similar questionnaire returns from Dr. Janiger's files. This sample represents approximately 70 per cent of the subjects who were asked to complete the questionnaire. Of the 194 subjects, 73 were

*For a more complete treatment of these data, see the Appendix.

undergoing psychotherapy and took LSD an average of 3.6 times as a therapeutic aid. The remaining 121 subjects were volunteers and averaged 1.9 sessions. The average interval between the administration of LSD and the completion of the questionnaire was ten months and the average maximum dosage 171 mcg.

The following is a summary of the percentages of subjects claiming changes attributable to LSD.*

| <u>ITEM</u> | <u>%</u> |
|--|----------|
| Major objective change (job change, marriage, divorce, etc.) | 16 |
| Positive change in interpersonal relations | 41 |
| Positive change noted by person closest to you | 45 |
| Value changes; money, status, human relationships, etc. | 48 |
| Percentage of subjects who described the LSD experience as: | |
| Very pleasant | 66 |
| Would like to try again | 74 |
| Religious | 24 |
| Gave great understanding of self and others | 61 |
| Feel experience was of lasting benefit | 58 |
| Percentage of subjects who felt LSD should be used in: | |
| Becoming aware of self | 75 |
| Gain new meanings to life | 58 |
| Getting people to understand each other | 42 |

In the appendix the data are treated by therapy and non-therapy groups and the latter is further broken into four occupational groups. The results are also reported by sex. The group in psychotherapy tended to claim more benefits from the experience than did those not in therapy, except for the artist group, who were participating in a special creativity study. Of the four non-therapy groups, the physician-psychologists claimed the fewest benefits--six of the 28 marked none of the questions positively. This group may have been motivated by intellectual curiosity, whereas the artist group

*For a complete treatment of these data, see the Appendix.

generally stated that they hoped to gain closer contact with the artistic or creative aspects of the mind. It might also be hypothesized that the artist group was more accustomed to being in contact with the non-intellectual portion of the mind. A complicating factor to be considered is the fact that the physician-psychologist group was typically given the questionnaire at a considerably longer time after the LSD session than was the artist group.

The only marked sex difference was that a higher proportion of males found the experience pleasant. In the non-therapy group, the females tended to claim a somewhat higher number of benefits, but this may have been related more to occupation than to sex.

For the purpose of the present study it is important to investigate the longevity of beneficial claims resulting from LSD. In general, those persons for whom the interval between LSD administrations and the completion of the questionnaire exceeded one year claimed benefits about two-thirds as frequently as did those for whom the interval was three months or less.

In evaluating the results of the above studies it should be considered that they are subject to the weaknesses of the questionnaire method. The subject may have a bias to answer questions in a manner to agree with his concept of the investigator's position. Also, questionnaires are particularly vulnerable to the halo effect, i.e., the generalizing of the extraordinary LSD experience to claims of change in areas which are not necessarily supported by corresponding behavioral changes. However, the claims in both studies were at least partially corroborated by the evaluation of the "person closest to the subject." Finally, there is the bias of the sample of subjects participating in the studies. They were largely volunteers and, therefore, could be assumed to have a higher degree of motivation than could be

expected in the general population. In summary, the above-noted questionnaire results are not being offered as strong evidence that LSD can produce decreases in dogmatism and closed-mindedness; however, they do appear to be sufficiently suggestive to warrant further research of a more controlled nature.

LSD IN PSYCHOTHERAPY

Observations that LSD inhibited defense mechanisms and facilitated self-insight led to investigations of its use in psychotherapy (5). Frederking, in Germany, used both LSD and mescaline, and found they aided in psychoanalysis (22, 23). He strongly recommended that therapists using LSD should study the effect of high dosages on themselves prior to using it in therapy. Since these early studies, there have been many articles published concerning the use of LSD in psychotherapy. The results of its use with psychoneurotics have generally been reported as positive, while studies on the treatment of psychotics have been considerably less promising. I shall briefly review some of this work since, of the published literature on LSD, it is the most closely related to the subject of this paper.

There is general agreement that LSD is not successful in the treatment of chronic psychotics (35). Withdrawn patients can often be contacted with the drug, but the change is usually of short duration. The more agitated psychotics frequently react to LSD with an intensification of their symptoms, as opposed to the normalizing effect of chlorpromazine. Some investigations have found a combination of mescaline and chlorpromazine useful in the treatment of acute psychosis in the early stages (14).

Psychoneurotics are reported to show improvement much more rapidly than with conventional therapies. Sandison has worked extensively with neurotics

in England, using low dosages of 25 mcg. initially, with weekly increases up to 100-200 mcg. (51, 52). Therapy is done in a hospital setting with a special ward reserved for LSD patients. He stresses the importance of the setting, and the helpfulness of nurses and other aides having had personal LSD sessions. In one study, he reports on 94 chronic neurotics showing 65 per cent improvement after follow-up periods of six months to five years. Eisner and Cohen treated 22 patients with an average of four to five weekly LSD sessions, also using the low initial dose with weekly increments (18). Some non-drug interviews were also used. They report 73 per cent improvement based on follow-up interviews ranging from 6 to 17 months. The improvement criterion was success in behavioral adaptation as judged by therapists, patient, and person closest to the patient. Chandler and Hartman rated the improvement of 110 patients on an eight-point scale and found, after an average of 6.2 sessions, that 66 per cent showed considerable improvement, with 46 per cent showing marked or outstanding improvement (8). The dosage and criteria were similar to those of Eisner and Cohen.

Most therapists have maintained that it is essential that LSD be administered in a therapy setting, and that sessions should be interspersed with non-drug therapy, where the material uncovered by the drug is to be discussed and interpreted. Some have used small dosages of LSD to eliminate blocks in conventional therapy. On the other hand, a few therapists have claimed a high degree of success with only minimal therapy in addition to LSD. Van Rhijn, in Holland, has used large initial dosages of 200-400 mcg. administered in a completely dark room containing the patient and a passive "sitter" (64). He normally gives only a single session with very little subsequent patient-therapist contact. Some Canadian investigators have

employed a single session with minimal additional therapy, utilizing dosages of 400-1500 mcg. (37). In a sample of 61 alcoholics and 39 other psychoneurotics, they found that 49 per cent of the alcoholics and 56 per cent of the others were much improved after follow-up periods ranging from 3 to 18 months. Two other Canadian studies have found similar results with alcoholics, using a single session of 200-400 mcg. of LSD or 0.5 gram of mescaline (9, 57). It was mentioned in the previous subsection that 67 per cent of Ditman and Hayman's alcoholics claimed some improvement in drinking behavior resulting from a single LSD session, although no therapy was intended in this study, and the dosage was only 100 mcg.

The role of the transcendental or mystical experience in LSD therapy is of interest. Several therapists have failed to observe, or at least report, this type of phenomenon in their patients (2). Others regard the integrative effect resulting from these experiences to be one of the most important aspects of LSD therapy. Terrill reports, "One of the most intriguing aspects of the use of LSD in psychotherapy is that when positive changes have occurred they often seem to have occurred in terms of the person's value system rather than in terms of revived memories, interpersonal insights, and the like, as is usually the case with more traditional forms of psychotherapy. Such changes are apparently in the direction of a higher valuation of esthetic, creative, philosophic, and perhaps even religious interests" (60). The incidence of transcendental experiences appears to be greater with the higher dosages. Also, the orientation and methods of the therapist are very important in determining the content of the LSD experience.

In general, the literature on the use of LSD in psychotherapy is rather difficult to assess because of the wide difference in types of patients, methods, number and size of dose, and criterion for evaluating the results.

It appears, however, that as in other forms of psychotherapy, those patients who are strongly motivated to change receive the most benefit, while those with weak, ineffectual, and immature personalities do not have a good prognosis (8, 18, 52). Because of its rapid and dramatic results LSD therapy may, however, prove acceptable to some who are unwilling to undergo the long duration of the more conventional methods (8). The extent that LSD therapy needs to be embedded in the traditional non-drug approach is unclear. In this connection, the Janiger data described earlier showed that persons in psychotherapy generally claimed more benefits from LSD than did the non-therapy group; however, the claims of the artist group exceeded those in therapy, even though the mean number of LSD sessions was considerably higher for the latter.

SIDE EFFECTS OF LSD

An important consideration in the use of LSD is the possible side-effects and complications. Cohen has published a thorough study on this subject, giving the results of a questionnaire from 44 investigators (10). It involves almost 5,000 people who received LSD or mescaline on more than 25,000 occasions. The number of sessions per person ranged from one to 80, and the LSD dose size from 25-1,500 mcg.; that for mescaline ranged from 200-1,200 milligrams. Major adverse reactions are very rare, as indicated by the following table taken from Cohen's study.

ESTIMATED RATES OF MAJOR COMPLICATIONS ASSOCIATED WITH LSD

| Subjects | Attempted Suicide | Completed Suicide | Psychotic reaction over 48 hours |
|-----------------------------|-------------------|-------------------|----------------------------------|
| Experimental Subjects | 0/1000 | 0/1000 | 0.8/1000 |
| Patients Undergoing Therapy | 1.2/1000 | 0.4/1000 | 1.8/1000 |

No serious, prolonged physical side effects have been found, and no instance of physiological or psychological addiction to LSD was reported. Cohen writes, "Physiological addiction is unlikely because of the extremely rapid onset of tolerance." Abramson found that tolerance to LSD was generally lost in 3-5 days but lasted as long as 8 days in some subjects.⁽¹⁾

Minor adverse reactions were more frequently reported, the most common being short-lived depressions. Occasionally there are panic reactions during an LSD session and frightening or unpleasant episodes are often reported. Should these reactions become too prolonged or severe they can be rapidly terminated by LSD antagonists, such as chlorpromazine. Normally, the drug effect is completely over in 24 hours, although there have been a few reports of LSD states prolonged into the next day. As seen in the above table, however, reactions lasting more than 48 hours are very rare.

Cohen concludes that "with proper precautions (LSD is) safe when given to a selected healthy group." Precautions include the exclusions of detectable psychopathologies and the constant attendance of a trained and sympathetic person capable of providing reassurance during the active phase. Experimental subjects can be released to a friend or relative 6-8 hours after drug intake, but they should not drive for 24 hours.

In addition to Cohen's study, Sim reports on the very large sample of Army LSD subjects as follows: "Every one of the exposures reported in this paper, and about which the author has personal knowledge, was followed by complete recovery" (54).

V. DISCUSSION

Various conceptual models have been suggested to explain the effects of LSD and similar drugs. Several physical models hypothesize the inhibitory effect of LSD on various chemical or electrical activities of the central nervous system, and considerable experimental work has been done on animals in this area. While this is certainly an important approach, the purpose of this Memorandum can be served by a less technical conceptual interpretation. The most commonly mentioned explanation of this type contends that LSD disrupts the inhibitory functions of the mind. It has long been hypothesized that much of mental functioning is blocked from consciousness by some inhibiting mechanism, and that this has survival value, since it permits the organism to deal more effectively with stimuli coming from the outside world. It is supposed that LSD at least partially dissolves this mechanism, and for a short time allows the unimpeded flow of psychic processes which are normally suppressed. During the few hours that this condition prevails, the subject is able to view himself and his environment from a new and perhaps much clearer perspective. After the cessation of the drug effect, he is left with this learning experience plus a new awareness of the vast amount of material contained in the mind's unconscious. It seems unlikely, however, that such a short learning experience could produce such drastic changes as are frequently claimed by the LSD subject. It has been shown that LSD is essentially eliminated from the central nervous system even before the maximum psychological effect occurs, some 2 to 3 hours after ingestion (7), so long-lasting effects must be explained in some way other than a continuing chemical action of the drug.

Ditman and Hayman (16) have suggested that the effect of LSD may be similar to that hypothesized by Wallace (62) to account for sudden and

dramatic personality changes observed under naturally occurring stresses. He postulates that there may occur "a massive and sudden mental synthesis of a therapeutic or adaptive character, under more or less extreme stress ... (with a) partial or total abandonment of certain values and acceptance of others." James (29) has written of the stress of reaching rock-bottom causing a sudden and lasting break from alcoholism, and the Canadian group, starting from this idea, have been quite successful in treating alcoholism by producing an "overwhelming experience" with a single large dose of LSD or mescaline (9, 37, 57). Eisner postulates that the organism has a "health-seeking orientation" and, temporarily freed from the rigidity of certain mental protective mechanisms, it will tend to reorganize in a more effective adaptive fashion (19). Electro and insulin shock therapy might be hypothesized to have a similar mode of action, although they are much more violent in their physical effect, and consciousness is not maintained, as it is with LSD.

Dramatic objective changes have been noted in the artistic-creative area as a result of LSD. Sandison reports one artist who drastically changed her style of painting after taking LSD and these changes have been maintained (49). Eisner and Cohen write that in one patient, "previously unsuspected artistic creativity broke through in the form of song writing and a novel of some merit" (18). One of Janiger's subjects (a writer) reports that he wrote and sold four novels after LSD, whereas he had previously been unproductive (31). Ditman and Hayman mention one subject who "even became a minor prophet of sorts" (16). Janiger has given LSD to some 30 artists, writers, and musicians and reports that they almost invariably commented on the similarity of the drug-induced state to the creative feeling,

and as a result of the LSD experience, claimed greater insight into the nature of art and the esthetic idea (30).

The transcendental or mystical experience is one of the most intriguing effects of LSD. As mentioned earlier, this is variously described as "feelings of oneness with the universe" or "seeing the meaning of life," etc. Some authors have treated the LSD transcendental experiences as an all-or-nothing occurrence; however, it may be experienced in various intensities ranging from a glimpse to a full-blown phenomenon which tends to have a tremendous and lasting impact on the subject. The extent to which claims of lasting benefits are linked to these types of experiences as opposed to those of personal insight is unclear. Subjects frequently report both types of experiences, and the two are sometimes so fused as to be indistinguishable. An examination of the subjective reports written by Janiger's subjects revealed that those persons who had marked transcendental experiences tended to claim a wide range of lasting benefits on the follow-up questionnaire.

These drug-induced mystical experiences bear a close resemblance to the very rare naturally occurring ones. James, who has written the most objective and thorough account of mysticism, finds the experiences sometimes produced by anesthetics (particularly nitrous oxide) to be quite similar to those occurring spontaneously (29). The modern philosopher and authority on Zen Buddhism, Alan Watts, writes that the LSD experience is quite similar to the mystical states which are sometimes attained by those practicing Eastern philosophies and religions (63). He notes, however, that by no means all persons taking LSD experience them.

Russell (47) has examined descriptions of mystical experiences and lists the following as being four of their most common characteristics:

1. Sudden insight or revelation with a sense of certainty;
2. Belief in unity--denial of the existence of opposites; good and evil are one;
3. A denial of the reality of time; and
4. Evil is illusory.

Excerpts from a description given by Janiger are evidence that most of these features tend to occur in the LSD experience:

As you watch this show, you may lose all track of time. A new vista opens up all in a moment, and while you feast upon it 'time stands still'. You have a feeling of 'nowness'. There is no past or future...It is as if you saw a new color, one outside the band of the spectrum people normally see...No amount of logic can refute it. For it didn't come to you via logic, but through direct contact, as if it sprouted within you sui generis. At the height of the drug I was really aware of only two things: my own existence and the world of nature which seemed to me beautiful and right! At the very summit of the drug's effects, there is a feeling of continuum, of flowing: I felt as if we were, as individuals, no more than whirlpools in a river, but whirlpools with wills which can come together and join as one, or disappear and join the river. (30)

The modern, rational man has virtually excluded mysticism from his concept of the mind's function. Reports of spontaneous occurrences of this type are extremely rare and they tend to be accorded the same kind of skepticism as are claims of extra-sensory perception. Modern man accepts an appreciation of music and art as being something outside the rational mind, but the claims of sudden insights and truths which are independent of logic are too much in conflict with the scientific approach for the strongly rational mind to consider. Perhaps a more palatable way of considering the subject is to look at the unconscious portion of the mind as a resource which may be tapped or triggered at times by a drug to increase the total effective power of the mind. William James' (29) observation of his experience with nitrous oxide intoxication describes this viewpoint very well:

One conclusion was forced upon my mind at that time, and my impression of its truth has ever since remained unshaken. It is that our normal waking consciousness, rational consciousness as we call it, is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are there in all their completeness, definite types of mentality which probably somewhere have their field of application. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question--for they are so discontinuous with ordinary consciousness. Yet they may determine attitudes though they cannot furnish formulas, and open a region though they fail to give a map. At any rate, they forbid a premature closing of our accounts with reality.

Russell, with his characteristic incisiveness, has argued that mysticism cannot compete with science in revealing truths (48). He discounts such claims resulting from experiences with anesthetics as arising from abnormal physical conditions and as such are abnormal perceptions. "Normal perceptions, since they have to be useful in the struggle for life, must have some correspondence with fact; but in abnormal perception there is no reason to expect such correspondence, and their testimony, therefore, cannot outweigh that of normal perception." Russell wrote this in 1935. In view of some of his more recent writings (46) and other activities in the nuclear age, there are indications that he may no longer hold the state of normalcy in such high regard. In fact, with the present arms race, and with the feasibility of doomsday machines being seriously discussed, the value of statistical normalcy is certainly open to question. We have recently observed mass psychosis on a nation-wide scale (Nazi Germany), and there are some who feel it may occur on a world-wide basis (24, 25). Under such conditions, mass drug therapy is within the realm of possibility. The alacrity with which the public has taken to tranquilizers would seem to indicate its introduction might not meet with much opposition. While

tranquilizers dull the mind to emotional stresses and conflicts, LSD appears to enable closer examination and resolution of these conflicts.

In any event, Russell goes on to state that, while he cannot consider mysticism as a source of truth, the mystical emotion can be of "very great value" to the individual experiencing it. In a similar vein, James draws a sharp distinction between institutional and personal religion, and confines himself to examining the characteristics and benefits of the latter (29).

VI. RESEARCH PROJECT

PURPOSE

The primary purpose would be to determine, under controlled, experimental conditions, if significant, long-lasting changes in attitudes, values, communicative ability, and social insight result from the administration of LSD to normals. More specifically, the experiment would concentrate on measuring changes in dogmatism, opinionation, and ethnocentrism which would facilitate understanding and communication between opposing factions. One of the most commonly reported phenomena of the LSD experience is the tendency for the mind to present multiple viewpoints of a problem in very rapid succession. The tendency to think in absolutes is virtually abolished while under the effect of LSD, and the questionnaire studies described earlier indicate that a substantial portion of the subjects claim that changes in tolerance and open-mindedness are retained to some extent for several months or years. The central theme of this study would therefore be to determine if these claims can be experimentally confirmed, and if it can be demonstrated that as a result, communication between opposing sides can be improved.

In addition to the primary purpose, three secondary goals would be included which are meaningful only if positive results are attained for the primary purpose: First, measurement of the ability to predict, on the basis of pre-LSD interviews and/or tests, those subjects who will evidence the most marked changes. Second, measurement of the ability to make the same prediction on the basis of the subjective content of the LSD experience. In other words, we should like to know if the type of person most susceptible to change can be predicted in advance, and what aspects of the LSD experience produce lasting changes. The third goal would, in so far as possible, determine how pre-LSD preparation of the subject and the conduct of the LSD

session affect the ability to produce change. This last goal would not be a major design variable, since every effort would be made to provide the most favorable environment from the beginning of the experiment; however, it may prove advisable to vary the subject preparation and conduct of the LSD session in order to arrive at the most effective methods.

MEASUREMENT INSTRUMENTS

Measurement of possible change in the above listed areas of concern would consist of five parts: (1) administration of scales on values, dogmatism, opinionation, ethnocentrism, and the ability to tolerate ambiguity prior to the administration of LSD and at post-LSD periods of one, six, and twelve months; (2) measurement of pre- and post-LSD ability to solve problems requiring marked shifts in perception and approach; (3) administration of a questionnaire to the subject's spouse or other close contact concerned with their evaluations of any change in the subject resulting from the LSD experiences; (4) pre- and post-LSD discussion sessions between groups of four to six subjects of widely different attitudes, disciplines, and ideational viewpoints which would be evaluated from the standpoint of measuring changes in communication; and (5) a clinical evaluation at the end of the experiment based on an interview and the subject's answers to a set of open-end questions dealing with their impression of the lasting effect of the LSD experiences.

Scales

Several scales are presently available for measuring the areas of concern in this experiment. The California F-scale on authoritarianism, together with the E-scale on ethnocentrism, have been used quite widely.

They were both developed in connection with the well-known book, The Authoritarian Personality (3). Also, Rokeach has worked for several years in this area and developed scales of dogmatism and opinionation which measure rigid thinking on both the left and right political orientations, whereas the California F-scale is biased toward the latter (44, 45).

Rokeach's definition of dogmatism is of interest: "a relatively closed cognitive organization of beliefs and disbeliefs about reality, organized around a central set of beliefs about absolute authority which, in turn, provide a framework for patterns of intolerance and qualified tolerance toward others." While these scales would definitely be helpful in developing a measurement instrument for the current proposal, I feel that they would need to be considerably modified to measure the rather unique aspects of the LSD experience. Also, for scales of this type, there is a need for the items to deal with current controversies, and some of the questions making up the above-mentioned scales treat topics which are now outdated.

The measuring instruments are crucial to the present project. LSD has already been administered to several thousand persons, so the additional knowledge that could be obtained by the present study is highly dependent on the adequacy of the scales and other instruments used. For this reason, I feel that two to three months should be allocated for adapting available scales for the present purpose.

Behavioral Measures

One of the questions that has been raised concerning the validity of the post-LSD questionnaire results cited earlier is the likelihood that they are at least partially attributable to the halo-effect. That is, the subject has a dramatic and profound experience while under the effect of LSD, and

this tends to be generalized to influence his assessment of change in a wide number of areas in which corresponding behavioral changes are not evident. The post-LSD scales of dogmatism, etc., are not as vulnerable to the halo-effect as were the follow-up studies described in the previous section. The latter asked the subject if he felt he had changed in a particular area as a result of the LSD experience. The pre- and post-LSD scales of dogmatism, etc. do not require a personal evaluation of changes resulting from LSD. The subject is merely required to indicate the extent to which he agrees or disagrees with various statements. It is also quite desirable to obtain additional behavioral measures related to the changes, if any, measured by those scales. In this connection, Rokeach has shown several differences in persons scoring high and low on dogmatism scales (68). With intelligence measures held constant, persons scoring high took a significantly longer time to solve problems whose solutions require marked shifts from the normal perception or approach. They also indicated less appreciation for unconventional, atonal music. Another interesting finding was a very marked difference in the results on the Thematic Apperception Test. This test requires the subject to tell stories based on ambiguous pictures. Persons scoring high on the dogmatism scale tended to construct stories in the future tense, while the low scorers told stories which concentrated much more on the present situation.

It is proposed that we measure the pre- and post-LSD ability to solve problems of the type used by Rokeach, and perhaps some of the other differences which appear to be related to the dogmatic personality. If subjects performed better on the post-LSD test, this would support the hypothesis that a decrease in dogmatism or closed-mindedness had occurred, and would avoid the halo-effect problem.

In addition to the problem-solving test, we should like to have behavioral measures of changes in dogmatism, etc., in the subject's normal interpersonal relationships. It is difficult to obtain direct measures of this; however, it is proposed that a questionnaire on these types of behavioral changes be administered to the spouse or close contact of the subject approximately six months after the last LSD session.

Finally, if some of the subjects are drawn from extreme right- or left-wing organizations, it may be possible to obtain an additional behavioral measure in terms of the number resigning or becoming inactive.

Communication Measures

One of the crucial features of experimentally measuring communication is to determine if the receiver actually listens to, comprehends, and answers the message being sent. If one listens to a political debate, he is aware that it is fairly easy to distinguish between replies which meet the above criterion as opposed to those which circumvent, pose other questions, or in other ways are not related to the previous message. It is proposed that a scoring system be constructed to measure this feature in a discussion session. Groups would be formed of 4-6 persons, preferably with an equal number at opposite poles of the assigned topic of discussion. Groups could be made up of persons holding opposite views on politics, religion, fallout shelters, or other topics. Because of the intrinsic public interest in the LSD phenomena, it appears likely that some of these discussion groups could be made up of the leaders of various movements if desired. Having a group composed of very articulate persons would probably enhance the ability to measure communication.

Each group would discuss a topic prior to taking LSD and at a time approximately one month following its administration.* The necessity of having a moderator would be determined in a pilot study. The sessions would be recorded and the speakers identified at each contribution. Judges would then score the recordings primarily on the basis of the extent to which each contribution reflects evidence of communication of previous messages. The number of dogmatic statements, conciliatory proposals and other relevant measures will also be made. Any references to the LSD experience or previous discussion session would be edited out of the recording so that the judges would not know which sessions are pre- and post-LSD. Control groups would have two discussion periods without the interspersed LSD session as described in a later sub-section. Post-LSD communications would thus be compared both to the pre-LSD session for the same group, and with the second session of a control group.

In addition to the scoring of the recordings by the judges, the participants of both the experimental and control groups would be asked to complete a brief scale at the end of each discussion session, indicating the extent they agree with, disagree with, are aware of, or tolerant of the opposing viewpoint, plus their assessment of any change in their position between the two sessions.

Clinical Evaluation

The clinical evaluation would have three purposes: (1) to determine if those persons evidencing the greater changes as measured by the above described instruments could be predicted with better than chance validity on the basis of a pre-LSD interview and/or brief psychological tests; (2) to

* Two studies have measured changes in interpersonal communications in subjects under the effect of LSD (34, 43); however, the present study is only concerned with post-LSD effects.

make the same determination on the basis of a subjective report of the LSD experience written by the subject the day following the LSD administration; (3) to make a separate clinical evaluation of changes, if any, resulting from administration of LSD based on the pre-LSD interview, a second interview made at the end of the experiment, and an open-end questionnaire completed by the subject concerning his assessment of the lasting effects of the experiment.

SUBJECTS

A pilot study of about ten subjects would be conducted to enable testing and revision of the measuring scales and other experimental methods. The main study would consist of about 100 volunteers, with efforts made to obtain sub-samples with widely different viewpoints on politics, method of combating the nuclear threat, or other subjects. To the extent possible, subjects scoring high on the dogmatism, authoritarianism, opinionation, and ethnocentrism scales would be chosen in order to permit a decisive test of the hypothesis that these traits will be reduced by the administration of LSD.

The sample of 100 would then be equally divided into an experimental and a control group matched on the basis of pre-LSD scale scores, age, sex, intelligence, education, socio-economic status, and (where relevant) membership in organizations such as ultra-right or left-wing groups. All subjects would have volunteered for the drug experiment, but only the experimental group would receive LSD sessions. If desired, the commitment to provide each subject the opportunity to take LSD could be satisfied for the control group after the end of the 12-month follow-up period.

The control group of 50 would be further divided into a sample of 20 who would receive the stimulant, dexedrine instead of LSD, while the remainder would receive no drug or placebo session (until the end of the follow-up period). It is felt that the use of a drug such as dexedrine, which would produce some physiological symptoms, would provide a better control than would a simple placebo. To the extent possible, the dexedrine group would be treated identically with their matched counterparts in the LSD experimental group. There are some experimental difficulties in this connection which will be discussed in the next sub-section.

In summary, the sample of 100 would be chosen from a larger group on the basis of scores on scales of dogmatism, etc. The experimental group would then receive:

1. A pre-LSD interview and tests requiring 2-3 hours, with additional instructions aimed at minimizing anxiety about the LSD experience;
2. A group discussion session requiring 1-2 hours;
3. Two LSD sessions at an interval of about four weeks, each requiring six hours;
4. A second group discussion session of 1-2 hours about four weeks after the second LSD session;
5. Group administration of the same or alternate forms of the original scales of dogmatism, etc., at post-LSD periods of one, six, and twelve months; at least one of these sessions would include the problem-solving test;
6. Administration by mail of a questionnaire to the spouse or close contact of the subject six months following LSD, concerned with the changes, if any, observed in the subject;
7. A one-hour clinical interview of the subject at the end of the 12-month follow-up period;

8. Completion by the subject of a brief questionnaire on his assessment of any change resulting from the LSD experience (to be completed just prior to the final interview).

The dexedrine group would be treated the same as above except for the drug administered. The remainder of the control group would receive 2, 4, and 5 in addition to the pre-LSD scales, plus an LSD session at the end of the experiment if desired.

METHOD OF LSD ADMINISTRATION

This portion of the project would be based largely on the replies to a list of questions submitted to the six consultants mentioned at the beginning of this Memorandum. They have had a combined experience of giving LSD to some 600 therapy and 1100 experimental subjects, with a total of 6000 sessions.

Prediction of Differential Response to LSD

The question was posed as to whether that portion of the subjects who show the more marked changes following LSD could be predicted in advance with better than chance validity on the basis of (1) up to three hours of pre-LSD interviews and/or tests, and (2) the subjective content of the LSD experience. In general, the reply to the first of these was positive, and the major criterion for maximum effect was openness to new and different experiences, personal insight, and ability to maintain flexibility under moderate stress. Some correlation between intelligence and intensity of reaction was also claimed. Indications for minimum change following LSD are excessive anxiety, intellectual rigidity and over-rationality, somatic reaction to stress, and a general disbelief in the value of the LSD experience. The consultants indicated they would depend largely on pre-LSD interviews

for prediction purposes, but some felt a projective test such as the Rorschach or Thematic Apperception Test would be useful when used by a skilled clinician.

Regarding predictions of post-LSD change based on the subjective content of the session, there was general agreement that personal insight and transcendental experiences were indicative of the more marked change. Concerning the transcendental phenomenon, they felt that it was most valuable when the subject maintained personal identity rather than experiencing it as disassociated from himself.

Preparation of the LSD Subject

As mentioned earlier, the attitude of the subject and the conduct of the LSD session are very important determinants of the over-all effect of the experience. Consultants felt that special efforts should be taken in the pre-LSD interviews to allay anxiety concerning the experience. The subject should be assured that LSD is safe, that he will be well taken care of and protected during the experience, and should feel free to let himself go with the effects of the drug. He should feel that the experimenter is interested in him as a person and should become acquainted with the person who would be with him during the session at the time of the pre-LSD interview.

It was suggested that prior to the LSD session the subject be given reading material such as Huxley's Doors of Perception or other subjective reports of LSD experiences to familiarize him with the types of phenomena he might expect, and also to make him aware that he can receive some pleasant and personally rewarding benefits from the experiment. If subjects can be enabled to feel relatively secure and to have positive expectations, they

are likely to have more intense experiences, which seem in turn correlated with long-lasting effect.

Regarding that portion of the control group who will be given dexedrine, it may not be possible to create an experimenter-subject relationship which is identical in all respects to that obtaining for the experimental subjects receiving LSD. The creation of positive expectations by means of an honest and sincere relationship between the experimenter and the LSD subject is an integral part of the hypothesis to be tested, and it would not be possible to duplicate this where the experimenter is aware that the subject is receiving another drug. There was agreement among all the consultants that a double blind experiment is not feasible with LSD dosages of 150-200 mcg. It is proposed that the dexedrine subjects be obtained from college students and paid for their participation in a drug experiment without naming the drug. Their matched counterparts, receiving LSD, would also be paid and would not be told the identity of the drug prior to volunteering. They would be chosen from another college so as to avoid interaction with the dexedrine subjects.

Dosage

There was general agreement that dosages of around 150-200 mcg. for men and 150 mcg. for women would be advisable for the type of experiment described in this paper. This is a fairly high initial dose, but has been shown to be quite safe with normals. While very intense reactions can be obtained with 50 mcg., there is a larger percentage of subjects responding in this manner with the higher dosages. As mentioned earlier, subjects who approach the experience from negative or highly intellectual viewpoints tend to have less intense responses to the drug; however, with the higher dosages, there is a better chance of overcoming this initially unfavorable attitude.

Setting

All consultants felt that the subject should be in a protected, quiet, and tastefully decorated setting while under the effects of LSD. The room should be capable of being semi-darkened and contain a couch. Facilities should be available for playing music. Although most subjects choose to remain quiet during the height of the experience, a recorder should be available to be used when desired. As has been previously stressed, having a friendly and understanding person in attendance who has had personal LSD experience is very important.

One decision which would need to be made regarding the setting is whether to administer LSD individually or in groups. There is general agreement that the former is somewhat more likely to produce intense and longer lasting experiences, although group subjects may provide support to each other, particularly if they are acquainted in advance (55). Group administration is desirable from the standpoint of economy and the feasibility of a larger sample of subjects. Some suggested that it be given to a group, with facilities for a person to go to a separate room if he desires. The playing of music and a darkened room tend to overcome some of the disadvantages of group administration. The consensus of the consultants on this question was that individual administration is probably the most desirable; however, if cost and time were important considerations, the use of groups of two to four would also be effective.

Number of Sessions

As demonstrated by the questionnaire results cited earlier, claims of benefit can be quite pronounced after a single LSD session. Many subjects, however, report that the reduced anxiety resulting from having experienced

LSD allows them to utilize a second session more effectively. Most subjects express a willingness, even eagerness, to try it a second time. Almost always, the nature of the second experience will be very different from the first. It is felt that for the purposes of the present proposal, subjects should receive two, or at a maximum, three sessions.

Costs

As a condition for obtaining and using LSD, a physician must administer the drug and be available for a 4-6 hour period; however, it is not necessary that he be in attendance. This requirement does, however, limit the place of LSD administration, and a hospital setting may be the best solution. Should this be adopted, it would be quite important to provide a quiet, protected, darkened, and tastefully decorated room.

Under these conditions the cost of a physician's services should be minimal. It is, however, necessary to have a trained person in attendance during the LSD session, and it is desirable that the same person conduct the pre-LSD and terminal interviews. It is proposed that LSD be administered in groups of two. With 10 pilot-study subjects receiving a single 6-hour LSD session and 50 experimental and 20 dexedrine subjects receiving two sessions, this would amount to 450 hours, plus four hours of individual tests and interviews per LSD and dexedrine for an additional 320 hours. Should the control group be given an LSD session at the end of the experiment, this would be a small additional cost, since it could be accomplished in larger groups of perhaps 5 or 6.

The following is a tabulation of the expected costs:

Place of administration (room should be quiet,
protected, darkened, and tastefully decorated)..... 75 six-hour periods;
Availability of a physician (not attendance)..... 75 six-hour periods;
Attendance by clinical psychologist..... 75 six-hour periods;
Testing and interviewing by clinical
psychologist..... 320 hours;
Judging recordings of communication
sessions..... 250 hours;
Subject participation time at \$2.00 per hour
(includes all participation for 40 students
and testing time for remaining 60 subjects)..... 1440 hours;
Development of experimental methods..... 4-6 man-months;
Obtaining subjects and overseeing LSD
administration, testing, and
discussion sessions..... 6 man-months;
Analysis of data and report writing..... 6 man-months;
Tape recorder and record player
Travel--one initial trip to the East for one week.

Because of the 12-month post-LSD follow-up period, the final report would not be finished until approximately two and a half years after the beginning of the study, but interim reports would be available earlier.

APPENDIX

Summary data from two LSD follow-up questionnaire studies were presented in the text. A more detailed report of these studies is given here.

For the Ditman and Hayman study of 74 questionnaire returns, the authors describe the LSD administration as follows:

The subjects in our setting received no intended psychotherapy during the actual LSD experience. In general the atmosphere was relaxed, permissive, with the subjects well-protected from outside disturbances. They were allowed various sensory stimuli such as music, paintings, darkness or gardens. Usually the LSD was given to groups of three to five subjects with at least one 'sitter' constantly present who, himself, had experienced LSD on a former occasion...the subjects were often instructed that this was 'their day,' that they should let themselves flow with the effect of the drug for the least discomfort, and they should feel free to laugh, cry, lie down, or to express other forms of motion or emotional behavior within the protective confines of the setting (16).

The following is extracted from a table giving the responses to the question: "Looking back on your LSD experience, how does it look to you now? Percentages are the responses in the first two of the following four categories, 'Very much,' 'Quite a bit,' 'A little,' or 'Not at all.'"

| | <u>%</u> |
|---|----------|
| A very pleasant experience..... | 72 |
| Something I want to try again..... | 66 |
| An experience of great beauty..... | 66 |
| Greater awareness of reality..... | 64 |
| Temporary benefit to me..... | 55 |
| Gave me great understanding of myself and others..... | 54 |
| Feel was of lasting benefit to me..... | 50 |
| The greatest thing that ever happened to me..... | 49 |
| A religious experience..... | 32 |
| Very unpleasant experience..... | 19 |
| Experience of insanity..... | 7 |
| Did me harm mentally..... | 1 |

The following is extracted from a table giving the responses to the questions, "How were you, or what were you left with after the LSD experience?" Again, figures are the total percentages for the two categories: "Very much" and "Quite a bit."

| | |
|---|----|
| A new way of looking at the world..... | 48 |
| A greater understanding of the importance and meaning of human relationships..... | 47 |
| A new understanding of beauty and art..... | 43 |
| A greater awareness of God, or a Higher Power, or an Ultimate Reality..... | 40 |
| A sense of greater regard for the welfare and comfort of other human beings..... | 38 |
| A sense of futility and emptiness..... | 7 |

The following gives a comparison of patients and normals:

| | <u>Patients</u> | <u>Normals</u> |
|---|-----------------|----------------|
| Claims of improvements: (subjective)..... | 60 | 32 |
| Claims of improvement: (external factors-- income, abode, etc.)..... | 40 | 6 |
| Experience of lasting benefit..... | 53 | 35 |
| Experience of temporary benefit..... | 54 | 44 |
| Pleasant experience..... | 65 | 76 |
| Increased understanding of self and others... | 60 | 41 |
| Greater understanding of the importance and meaning of human relationships..... | 48 | 38 |
| A religious experience..... | 30 | 29 |

The second study was based on an analysis of data extracted from 194 follow-up questionnaire returns from Dr. Janiger's files. Of the 125 questions contained in the form, I selected 20 which were most relevant to the present study. They are:

1. Has any major event (i.e., divorce, change of job, etc.) occurred in your life directly as the result of LSD? If so, what?

2. In what ways, if any, do you feel LSD has changed your inter-personal relations with the following (include in your discussion such attitudes as tolerance, understanding, broadmindedness, annoyance, and irritability):
 - (a) Co-workers and employers.*
 - (b) Other people whom you have known for a long time.
 - (c) Other people whom you have recently met.
3. Have you noticed any difference in your interests or understanding in any of the following areas? Have you changed as a participant, creator, or observer in any of the following areas?
 - (a) Social reform.
 - (b) Political, i.e., national and international affairs, etc.
 - (c) Moral and ethical.
 - (d) Anthropological, i.e., other cultures, primitives, etc.
 - (e) Other universal concepts, i.e., meaning of life, your place in relation to the rest of life, etc.
4. Has the person closest to you noticed any marked change in you? (Please ask this person to be as specific as possible.)
5. What changes, if any, have taken place in your sense of values, (i.e., the importance to you of money, status, possessions, politics, religions, philosophy, etc.)
6. Looking back on your LSD experience(s), how does it look to you now? (For these items, subjects checked one of the following: not at all, a little, quite a bit, and very much.) A check in either of the last two categories was scored positive.
 - (a) A very pleasant experience.
 - (b) A very unpleasant experience.
 - (c) Something I would want to try again sometime.
 - (d) A religious experience.
 - (e) An experience which gave me greater understanding into myself and others.
 - (f) An experience which I feel was of lasting benefit to me.

* If this question was inapplicable because of unemployment or self-employment it was scored as follows: positive if both 2b and 2c were positive; none if both 2b and 2c were none or negative; and $\frac{1}{2}$ if one, but not both, of 2b and 2c was scored positive.

7. How do you feel LSD should be used?

- (a) Becoming aware of oneself.
- (b) Gaining new meanings to life.
- (c) Getting people to understand each other.

Of the 194 subjects, 73 were undergoing psychotherapy at the time and took LSD as a therapeutic aid. The remaining 121 subjects were volunteers. These were divided into four groups by occupation. A breakdown of subjects by number of LSD sessions is as follows:

| Subjects | No. of Sessions | | | | Total Subjects |
|------------------------------|-----------------|-----|------|-----|----------------|
| | 1 | 2-4 | 5-10 | >10 | |
| Therapy | | | | | |
| Male | 6 | 21 | 6 | 6 | 39 |
| Female | 20 | 10 | 3 | 1 | 34 |
| Non-therapy | | | | | |
| Physicians and psychologists | 24 | 3 | 1 | 0 | 28 |
| Artists | 18 | 3 | 2 | 1 | 24 |
| Teachers, engineers, etc. | 13 | 6 | 1 | 1 | 21 |
| Other | | | | | |
| Male | 13 | 6 | 1 | 0 | 20 |
| Female | 20 | 7 | 0 | 1 | 28 |
| Total | 114 | 56 | 14 | 10 | 194 |

One of the non-therapy groups contained twenty physicians, seven psychologists and one dentist. A second group was made up of artists, writers, musicians, and entertainers, and also contained three ministers. A third group contained nine teachers, three engineers, and a variety of other professions. The fourth group labeled "other" contained twelve housewives, ten secretaries, seven students, and a number of other occupations.

The conditions under which LSD was administered varied somewhat. The therapy group was made up of patients under several psychotherapists and

the conduct of the session depended on their orientation. It should be mentioned that for some of this group LSD was somewhat incidental to their over-all treatment and the results are perhaps not comparable to those of patients for whom drug treatment played a major role. The artists participated in a creativity study in which they were asked to paint specific objects while under the effects of LSD. The other non-therapy subjects were generally left undisturbed, and wrote a subjective report the following day.

Table 1 lists the percentages of the various groups responding positively to each question. At the bottom of the table the average total score is given for each group. The total score was obtained by giving a score of one for each positive answer except 6a, 6b, and 6c, with indeterminate answers scored one-half. The maximum possible total score for a subject was therefore 17. The total score is a very heterogenous measure, but does provide an indication of the over-all reaction of the various groups.

Of positive answers to the questions, "becoming aware of self" ranked highest. Changes in values, and "positive changes noted by the person closest to you" also gave a fairly high percentage of positive answers. Of the "interest" questions, 3e, which most closely tapped the mystical or transcendental experience, had the highest percentage; 7b was also high. The majority of the subjects found the experience pleasant* and indicated they would like to try it again.

Only two of the groups included enough females to permit a breakdown by sex. The only marked difference on the questions was that a higher proportion of the males found the experience pleasant. In the non-therapy group,

*The "pleasant" and "unpleasant" questions were not mutually exclusive. Several subjects found some parts of the experience pleasant and other parts unpleasant.

Table 1

PERCENTAGE OF SUBJECTS GIVING POSITIVE REPLIES

| Item | Therapy | | Non-therapy | | | | | Total |
|--|---------|-----|----------------|----------|--------------------|-------|-----|-------|
| | Male | Fem | Phys. & Psych. | Art-ists | Teach., Engr., &c. | Other | | |
| | | | | | | Male | Fem | |
| 1. Objective change: job change, marriage, etc. | 20 | 26 | 7 | 20 | 10 | 0 | 15 | 16 |
| 2. Positive change in relations with others | | | | | | | | |
| a. Co-workers & employees | 53 | 68 | 19 | 45 | 29 | 29 | 41 | 43 |
| b. Long acquaintances | 42 | 52 | 30 | 44 | 19 | 47 | 48 | 41 |
| c. New acquaintances | 53 | 50 | 32 | 48 | 24 | 21 | 42 | 41 |
| 3. Increased interest | | | | | | | | |
| a. Social reform | 13 | 21 | 15 | 40 | 10 | 15 | 15 | 18 |
| b. Political & Internat'l affairs | 21 | 24 | 18 | 32 | 19 | 11 | 30 | 22 |
| c. Anthropological | 25 | 31 | 18 | 40 | 24 | 5 | 19 | 24 |
| d. Moral & ethical | 55 | 42 | 26 | 44 | 20 | 16 | 22 | 35 |
| e. Universal concept | 66 | 48 | 36 | 62 | 29 | 32 | 44 | 48 |
| 4. Pos. change noticed by person closest to you | 55 | 50 | 12 | 71 | 25 | 53 | 40 | 45 |
| 5. Value changes; money, status, human relationships, etc. | 63 | 55 | 30 | 64 | 38 | 26 | 50 | 48 |
| 6. Descr. of LSD experience | | | | | | | | |
| a. Pleasant | 75 | 58 | 59 | 67 | 76 | 72 | 56 | 66 |
| b. Unpleasant | 31 | 33 | 25 | 33 | 19 | 26 | 52 | 32 |
| c. Would like to repeat | 79 | 79 | 71 | 76 | 71 | 85 | 50 | 74 |
| d. Religious | 28 | 13 | 11 | 40 | 29 | 28 | 53 | 24 |
| e. Understanding of self and others | 70 | 70 | 32 | 72 | 52 | 57 | 63 | 61 |
| f. Lasting benefit | 61 | 69 | 32 | 76 | 52 | 57 | 56 | 58 |
| 7. How LSD should be used | | | | | | | | |
| a. Becoming aware of self | 90 | 82 | 43 | 84 | 71 | 79 | 73 | 75 |
| b. Gaining new meanings to life | 70 | 62 | 36 | 72 | 57 | 53 | 48 | 58 |
| c. Getting people to understand each other | 45 | 50 | 36 | 56 | 43 | 32 | 26 | 42 |
| No. subjects | 39 | 34 | 28 | 24 | 21 | 20 | 28 | 194 |
| Avg total score | 8.1 | 7.8 | 4.4 | 9.8 | 5.5 | 4.8 | 6.7 | 6.9 |
| Avg time since LSD (days) | 254 | 233 | 431 | 164 | 311 | 241 | 381 | 288 |
| Avg no. sessions | 4.7 | 2.3 | 1.4 | 2.7 | 2.3 | 1.6 | 1.8 | 2.6 |
| Avg max. dosage (μ g) | 197 | 162 | 161 | 165 | 185 | 167 | 151 | 171 |

the females had a significantly higher average total score, but this may have been due to the fact that the males' occupations were closer to the professional groups than were the females'. No sex difference was noted in the total scores of the therapy group, but the average number of sessions was not equivalent.

For the purposes of this Memorandum it is important to investigate the longevity of beneficial claims resulting from LSD. Table 2 shows the percentage of positive replies as a function of the days between the administration of LSD and the questionnaire for the therapy and non-therapy groups. Because of the large difference on this variable for the physician-psychologist and artist groups, the non-therapy portion is also shown with these groups deleted. Examination of the average total scores shows there is a definite decrease in claimed effect as a function of time, and that the decrement is sharpest during the first six months or so. Of individual questions, "becoming aware of self," changes in values, and claims of "lasting benefit" seem to be fairly resistant to erosion by time.

The following table shows that the average total score is positively correlated with number of LSD sessions; however, this variable is confounded with higher dosages on subsequent sessions and an assumed higher motivation or favorable impression on the part of subjects submitting themselves for multiple sessions.

| <u>Sessions</u> <u>Therapy</u> | <u>Subjects</u> | <u>Average</u> <u>Score</u> |
|-----------------------------------|-----------------|--------------------------------|
| 1 | 27 | 6.9 |
| 2-3 | 23 | 7.3 |
| ≥4 | 23 | 10.1 |
| <u>Non-Therapy</u> | | |
| 1 | 88 | 5.4 |
| 2-3 | 23 | 7.5 |
| ≥4 | 10 | 9.8 |

Table 2

PERCENTAGE OF SUBJECTS GIVING POSITIVE REPLIES AS A FUNCTION OF DAYS BETWEEN LSD SESSIONS AND DATE OF QUESTIONNAIRE

| Item | Therapy | | | Non-therapy | | | Non-therapy (Physicians and Artists Omitted) | | |
|--|---------|---------|------|-------------|---------|------|---|---------|------|
| | 0-100 | 101-389 | >389 | 0-100 | 101-389 | >389 | 0-100 | 101-389 | >389 |
| 1. Objective change: job change, marriage, etc. | 20 | 17 | 21 | 3 | 13 | 5 | 6 | 10 | 5 |
| 2. Positive change in relations with others | | | | | | | | | |
| a. Co-workers & employees | 52 | 30 | 56 | 38 | 32 | 21 | 40 | 37 | 27 |
| b. Long acquaintances | 63 | 38 | 44 | 48 | 35 | 22 | 56 | 37 | 23 |
| c. New acquaintances | 71 | 33 | 33 | 31 | 36 | 26 | 31 | 30 | 23 |
| 3. Increased interest | | | | | | | | | |
| a. Social reform | 25 | 10 | 16 | 31 | 15 | 14 | 13 | 5 | 19 |
| b. Political & internat'l affairs | 29 | 10 | 26 | 28 | 18 | 16 | 19 | 10 | 23 |
| c. Anthropological | 40 | 20 | 28 | 22 | 28 | 16 | 19 | 19 | 18 |
| d. Moral & ethical | 61 | 30 | 50 | 32 | 30 | 24 | 20 | 19 | 23 |
| e. Universal concept | 65 | 47 | 61 | 53 | 40 | 32 | 44 | 24 | 36 |
| 4. Pos. change noted by person closest to you | 61 | 37 | 61 | 55 | 37 | 20 | 53 | 28 | 24 |
| 5. Value changes; money, status, human relationships, etc. | 77 | 43 | 53 | 44 | 39 | 28 | 31 | 19 | 38 |
| 6. Descr. of LSD experience | | | | | | | | | |
| a. Pleasant | 67 | 59 | 68 | 71 | 61 | 57 | 81 | 55 | 59 |
| b. Unpleasant | 33 | 38 | 21 | 27 | 41 | 24 | 19 | 38 | 27 |
| c. Would like to repeat | 92 | 76 | 79 | 84 | 63 | 66 | 93 | 67 | 59 |
| d. Religious | 26 | 20 | 21 | 34 | 20 | 18 | 25 | 19 | 18 |
| e. Understanding of self and others | 80 | 67 | 58 | 75 | 50 | 32 | 69 | 57 | 18 |
| f. Lasting benefit | 71 | 59 | 58 | 78 | 38 | 42 | 75 | 38 | 50 |
| 7. How LSD should be used | | | | | | | | | |
| a. Becoming aware of self | 92 | 73 | 83 | 94 | 63 | 53 | 88 | 67 | 64 |
| b. Gaining new meanings to life | 84 | 55 | 63 | 78 | 43 | 34 | 81 | 43 | 32 |
| c. Getting people to understand each other | 68 | 18 | 44 | 50 | 35 | 21 | 31 | 33 | 18 |
| No. subjects | 24 | 23 | 19 | 32 | 40 | 38 | 17 | 23 | 22 |
| Avg total score | 9.7 | 6.2 | 7.7 | 7.9 | 5.5 | 4.3 | 7.0 | 5.0 | 4.8 |
| Avg time since LSD (days) | 37 | 180 | 583 | 47 | 223 | 637 | 50 | 226 | 615 |
| Avg no. sessions | 4.8 | 2.7 | 2.8 | 1.7 | 1.9 | 1.4 | 2.0 | 2.1 | 1.6 |
| Avg max. dosage (µg) | 189 | 165 | 188 | 168 | 170 | 160 | 167 | 174 | 162 |

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