THE PSYCHEDELIC STATE, THE HYPNOTIC TRANCE, AND THE CREATIVE ACT

STANLEY KRIPPNER

Maimonides Medical Center

SERGEI RACHMANINOFF, the gifted Russian conductor, pianist, and composer, plunged into morbid brooding at the age of 21 because of the unfavorable reception accorded his first piano concerto. No amount of success as a conductor or pianist could revive his morale. Extremes of emotion were characteristic of Russian composers and depression was especially fashionable at the turn of the century, but Rachmaninoff's misery was so relentless that his friends became alarmed. They eventually persuaded him to visit Dr. Nikolai Dahl, who specialized in hypnotic treatments.

During their first session together, the spare, gothic Rachmaninoff recoiled in distaste as he eased his slender frame into the doctor's chair. Following some preliminary instructions, Dahl repeated — over and over — such statements as, "You will begin to write another concerto; you will work with great facility." Rachmaninoff continued in treatment for three months, visiting Dr. Dahl daily for half-hour sessions.

In this instance, hypnotic suggestion was remarkably effective. Rachmaninoff's gloom evaporated and he began composing again, working with speed and inspiration. Musical ideas flowed from his pen, were expanded, and became unforgettable melodies. The finished work, Rachmaninoff's Concerto Number Two in C minor for Piano and Orchestra, was first performed in 1901 by the Moscow Philharmonic. Rachmaninoff openly acknowledged his debt to Dr. Dahl and dedicated the concerto to him; the composition was a critical success and is still a favorite with concert audiences.

Psychedelic ("mind-manifesting") drugs have also been used for creative purposes. In 1966, Navy Captain John Busby reported using LSD to solve an elusive problem in pattern recognition while developing equipment for a Navy research project. He stated, "With LSD, the normal limiting mechanisms of the brain are released and entirely new patterns of perception emerge" (*Life*, March 25, 1965).

In 1965, psychiatrist Humphry Osmond and architect Kyo Izumi announced that they had utilized psychedelic drugs in the designing of a mental hospital. Izumi took LSD during visits to traditionally-designed mental hospitals to determine their effect upon persons in altered conscious states. He found the long corridors and pale colors

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frightening and bizarre. The result of the Osmond–Izumi collaboration was a decentralized series of unimposing buildings with pleasant colors and no corridors; Izumi recalled that under LSD the corridor had "seemed infinite, and it seemed as if I would never get to the end of it" (Izumi, 1968; *Progressive Architecture*, August, 1966).

Altered states of consciousness, such as those induced by hypnosis and psychedelic chemicals, may assist in fostering the creative act because creativity is basically preverbal and unconscious in origin. Torrance (1962) has recognized the preverbal origins of creativity, defining it as the process of sensing gaps or missing elements, forming ideas or hypotheses about them, testing the hypotheses, and communicating the results. Freud (1938) has associated curiosity with unconscious drives, noting that "in the case of a creative mind . . . the intellect has withdrawn its watchers from the gate, and ideas rush pell-mell. . . ." Vinacke (1952) has stressed the necessity of intellectual freedom for creation to occur; to him, "there must be . . . an ability to reorganize experience with relative independence of external restraints."

Hypnosis appears to focus consciousness so intensely that subthreshold stimuli are perceived; in fact, hypnosis is frequently defined in terms of a heightened responsiveness to suggestion. Psychedelic substances (e.g., LSD, psilocybin, mescaline, marijuana, peyote) seem to affect consciousness in such a way that the nervous system is flooded with external and internal stimuli (Masters & Houston, 1968).

It may be that both hypnosis and the psychedelics can assist breakthroughs into the preverbal realm where creative inspiration has its origins. Many artists and scientists claim that their efforts at innovation exist as moods and feelings before they are expressed in words and other symbols. For Robert Frost, a poem began as "a lump in the throat, a sense of wrong, a homesickness, a lovesickness"; it was "never a thought to begin with." Richard Wagner is reported to have heard music spontaneously; Johannes Brahms once disclosed that he heard fragments of his themes as "inner harmony." Aaron Copeland has stated that a musical theme comes to him almost like automatic writing. The German chemist August Kekule produced a conceptualization of the benzene ring which was inspired by a dream of a snake holding its tail in its mouth.

Some individuals, especially religious mystics, attempt to foster this type of phenomenon. Ben-Avi (1959), while discussing Zen Buddhism, has counseled that "change, illumination, or growth must be rooted in the immediate, the concrete experience of the individual" rather than being based on conscious abstractions and intellectual formulations. Zen Buddhism, with its emphasis on concentration, is often regarded as a modification of autohypnosis. In autohypnosis, as in Zen, meditation can lead to increased concentration, a focusing of attention, and an increased receptivity to creative ideas.

Concentration is often quite intense during relaxation. When an

individual is most relaxed, his conditioned reactions to stimuli are characteristically "off guard" and flashes of creative insight may occur. It is as though a series of closed doors barred off a passageway of dark antechambers which ranged from the deep unconscious through several preconscious rooms, into the light of conscious awareness. We forget our unsolved problem, sleep on it, let go, and relax. A. E. Housman found that lines of poetry would flow into his mind during afternoon walks. Mozart stated that he composed most easily while riding or walking. Charles Darwin gathered specific biological data during many years of conscious struggle; however, his theory of evolution came to him while taking a carriage ride.

Henri Poincaré, the French mathematician, spent months at a work table but got nowhere in his attempts to investigate Fuchsian functions (a type of differential equation). Further insights developed over the next few weeks while Poincaré was vacationing and walking on the bluffs near the seaside — but not during his periods of conscious effort (1955).

Hypnotherapy and Creative Productions

A number of psychoanalysts have combined hypnosis with attempts to stimulate creative activity with their patients. Raginsky (1963) encouraged his hypnotized patients to construct images from clay. Not only was Raginsky able to utilize in therapy his patients' descriptions and associations of the clay models, he also found that the patients' reactions to the clay's texture, color, and odor could play a part in the therapeutic process.

Stating that the creative act may be an attempt to organize and integrate past emotional experiences with one's entire life pattern, Margaretta Bowers (1966) presented a provocative psychiatric case history of a patient, "Walter," a musician who was 24 years of age when hospitalized. Suffering from tension and anxiety, Walter was unable to work. He was diagnosed as schizophrenic, emotionally withdrawn, and as having little interest in his environment.

Because Walter was a poor hypnotic subject, it took 50 hours to secure a valid age regression. When this point was reached, the patient could be sent back into his past to relive traumatic experiences. It soon became apparent that one aspect of Walter's personality was childlike, while another resembled an angry parent. The patient referred to these two aspects of himself as "Walter Positive" and "Walter Negative." Day after day, the psychiatrist and her assistants gave their complete support to Walter Positive while attempting to "exorcize" Walter Negative.

The paintings which Walter did in occupational therapy seemed to have no psychological significance at first glance. One, for example, was essentially nondescript; it depicted the left hand with fingers extended upward. The back of the hand was showing, there was a

ring on the little finger, and the pink fingernails contrasted with the flesh-colored hand and the green sleeve.

One day the patient was hypnotized by Bowers and taken back to the day and hour when he painted the picture of the hand. Walter was asked to open his eyes and look at the picture, then told that he could see it in a mirror. Staring in the mirror, Walter drew the picture again. At this point, Bowers asked him several questions about his production :

Walter : The wrist and hand is Walter Positive. The fingers look stronger, the nails are longer. Hand is strong. He's got to be strong.

Bowers : What else do you see?

Walter : The pinkie is Walter Positive. The pinkie feels stronger because of the ring. Ring means positive, sureness, success.

Bowers : When did the ring get on the pinkie?

Walter : Just now.

Bowers : What does it mean?

Walter : It means it's strong. It's a success. . . . I see myself in front of an audience. I'm singing and everybody is enjoying it. . . . I can see myself in a tuxedo, wearing the ring. I'm in a group of people sitting at a table in a night club. I'm friendly with them and having a good time. They're laughing and I'm laughing. . . . I've found myself. . . .

Bowers : Is that what the painting means?

Walter : Yes.

The session lasted for nearly four hours; within this period of time the patient gave a more complete picture of himself than he had during the previous four months. Besides discussing his magic ring, he told about his father's masturbation of him as a child, of his seductive and possessive mother, and of his frequent witnessing of his parents in the act of sexual intercourse. He was so preoccupied with these sexual concerns that he did poorly in school and in musical auditions.

As Walter's therapy proceeded, his anxiety lessened, he went back to work, he made several successful appearances as a singer, and began to take an interest in other people. Bowers concluded that the method used successfully with Walter could be utilized with other patients who could not be reached by traditional therapeutic techniques.

Hypnosis and Academic Proficiency

McCord (1961) reported a provocative experiment with a mathematics professor, a university colleague of his. After assisting the mathematician in entering a hypnotic trance, McCord suggested that when awakened he would be given some calculus problems and would

be able to do them with high accuracy and at a faster rate than he had ever done such work before. The subject was then roused from his trance, provided with the calculus problems, and asked to solve as many of them as possible in 20 minutes.

The subject completed in 20 minutes a task that normally would have taken him two hours. This gain was accomplished by the skipping of steps in the mathematical process, performing "in his head" some of the calculations that he would normally have written out, and by writing down necessary calculations at a rapid rate of speed. There was no loss of accuracy despite the increased speed.

The mathematician reported that he enjoyed doing the calculus and that he felt his unconscious mind had participated in the calculations to a greater extent than usual.

Despite these frequently reported clinical instances of improved performance under hypnosis, Barber (1965) and Uhr (1958) in two thorough reviews of the psychological literature found the results "inconclusive" because so few well-designed studies had been done to measure the effect of hypnosis on problem-solving.

Hypnotic Susceptibility and Creativity in Children

Several experimental studies assume significance in tracing the association between the hypnotic trance and the creative act. For example, children appear to become less susceptible to hypnosis as they grow older as well as less creative.

London (1962) reported, after studying 57 boys and girls aged five and older, that children are significantly more susceptible to hypnosis than are adults. In standardizing the Children's Hypnotic Susceptibility Scale, he also found that the older children could "simulate" hypnosis with a great deal of effectiveness. Furthermore, susceptibility and age had a curvilinear relationship.

London's study bears a striking resemblance to the findings of Torrance (1962, pp. 97-98). His subjects showed drops in originality — as measured by objective tests — upon entering kindergarten, fourth grade, and junior high school. Torrance's data suggest that each time the child leaves one cultural setting (the home, the primary grades, elementary school) for another setting (kindergarten, the intermediate grades, junior high school), more attention is paid to the newly encountered problems in adaptation and less attention is devoted to creative activity.

It may follow that stereotyped thinking is an inevitable result of cultural indoctrination. As the growing child learns to see the world through the eyes of his culture, he surrenders his individualistic outlook, becoming less original, less open to new experiences, and less imaginative. Not only is it the more imaginative individual who is less likely to give up his interest in creative activity, it is also the imaginative person rather than the unimaginative one who reacts more quickly to hypnotic suggestion.

Cognitive Activity Without Awareness

Another piece of research which bears on the association between creativity and hypnosis was reported by Tinnin (1963), who recalled how common it is for an individual to put a difficult problem out of his mind and then, suddenly, to experience a spontaneous flash of insight or even a sudden solution. Tinnin attempted to bring about this phenomenon through hypnosis. He used three male college students who were able to attain post-hypnotic suggestibility and who reported complete amnesia for the hypnotic experience.

Tinnin's subjects entered a hypnotic trance and were told that upon awakening they would be asked a specific algebraic question such as, "How much is Y^2 plus Z^2?" The subjects were told that the correct values of Y and Z would be indirectly supplied in the waking state before the question would be asked.

The value of Y, for one subject, was the second digit in the left-hand column of a card shown immediately after awakening. The value of Z was the fifth digit in the right-hand column. This particular subject was told, while in a hypnotic trance, that he would be able to select the correct numbers unconsciously when he saw the card. He would then compute the correct answer unconsciously, whereupon that answer would enter his conscious mind.

None of the subjects claimed to be able to remember their instructions. Nevertheless, they almost invariably gave the right answers to the questions posed. None of the subjects gave indications of remembering the clues but all three of them did well in stating the correct answers.

One of the subjects saw the answer as a momentary visual hallucination. The other two experienced it as a sudden flash of certain knowledge; "It just popped into my mind," was a typical report. Tinnin concluded that cognitive activity could utilize clues without full awareness and that this activity could run parallel to, without intruding upon, concurrent conscious activity.

Murphy (1958, pp. 129-130) has incorporated the "flash of insight" into his delineation of stages in the creative process. First there is the long immersion of the sensitive mind in a fulfilling medium with the world of color, of images, of social relationships, of contemplation, etc. Secondly, experiences are acquired in "great storehouses" by this immersion and consolidate themselves into structured patterns. From these great storehouses of experience comes an inspiration or illumination such as Archimedes leaping from the bathtub shouting "I have it!" upon conceptualizing the law of specific gravity. Finally, the creative act is sifted, tested, "hammered out," and integrated into the individual's other experiences with which it combines to produce the new poem, painting, invention, or other creative product.

Creativity and Defensiveness

An experiment with 80 female college students, susceptible to hyp-

notic induction, has been reported by Patricia Bowers (1965). Previous research had suggested to Bowers that creative persons have greater access to fluid, undeveloped realms of ideas than non-creative persons and that creative individuals are less defensive than others. However, Bowers noted that data were lacking on whether or not the lack of defensiveness plays a *causative* role in creative expression.

Surmising that hypnotic trance induction would lower defenses temporarily, Bowers told a hypnotized group of students that they had the ability to be creative if they would allow themselves to make use of all their relevant experiences.

The group also was told to perceive in unconventional ways, to notice aspects of problems overlooked previously, to ignore the possibility of criticism, to recall past moments of insight and the emotional feelings associated with these moments, and to feel confident about their ability to do well on creativity tests. The same set of instructions was given to the non-hypnotized group; these subjects had participated in a program of relaxation which had lasted as long as the hypnotic induction period for the other group.

Each of the two groups was administered a number of creativity tests devised by Guilford before the instructional period. A comparable series of tests was administered following the instructions. There were no significant differences between the two groups' test scores attained in the pre-instructional period. Following the instructional period, the differences between the hypnotized group's scores and those of the non-hypnotized group were highly significant, with the hypnosis group doing significantly better. The hypnotized subjects also raised their scores above those obtained during the first test administration, while the non-hypnotized subjects did not. Bowers concluded that the greater originality displayed by the hypnotized subjects indicated that instructions administered under hypnotic conditions can increase creative thinking, at least insofar as it can be objectively measured.

Bowers attempted to control many more factors than had most previous research workers. She equated the instructions for each group as well as the time spent by the experimenter with each group and the experimenter's attempts to motivate the subjects. Both groups had been given clerical ability tests which were non-creative in nature. The fact that hypnotized subjects did not raise their scores on the clerical ability tests to a significant degree indicated to Bowers that a general heightening of motivation under hypnosis was not the main factor accounting for the superiority of her hypnotized subjects.

Bowers (1965) also selected two additional groups and administered a different set of instructions encouraging the subjects to be clever, original, flexible, and fluent, but not mentioning attitudes which would reduce defensiveness. Although the resulting data were not as dramatic as the results obtained when defense reduction suggestions were given, there was still a statistically significant difference favoring the hypnotized subjects. This finding indicates that reduced defensiveness is not

the only factor involved in creativity.

Bowers (1966) later conducted an experiment with a group of subjects who pretended to be hypnotized. This group did about as well on the creativity tests as did the hypnosis subjects, suggesting that the lack of personal defense is more important than formal hypnotic trance induction in fostering creativity. Bowers stated that the subjects who pretended to be hypnotized may have abandoned responsibilty for their typical personal behavior patterns while responding to the creativity test items, thereby increasing their powers of originality.

Attention and Distractibility

The work of As (1962) involved the hypnotized subject's ability to pay more attention to the hypnotist's suggestions than to other stimuli. There are, As suggested, two ways of explaining this process of selective inattentiveness to signals which do not emanate from the hypnotist. Perhaps the subject withstands distractions and irrelevant stimuli by making a conscious effort to do so, thus leaving his field of attention open for the hypnotist to manipulate. On the other hand, the subject may occupy himself with the cues and suggestions presented by the hypnotist; as a result, other stimuli become the objects of less attention. The first proposition emphasized the ability to actively block out distracting stimuli while the second proposition emphasized the ability to become absorbed in relevant material.

As prepared a list of 60 questions designed to investigate these two propositions. This list was administered to 152 subjects whose hypnotizability was subsequently measured by two standardized scales. The items in the list which tested the first proposition included such questions as, "When there are sounds that you do not want to listen to, can you block them from your mind so that they are no longer important to you?" and "Are you able to change easily from one task to another, excluding ideas, associations, and actions of the former task?" The subjects' responses to these questions were not positively related to the subjects' degree of hypnotic susceptibility as measured by the standardized scales.

The second proposition was tested by questions which inquired as to the subjects' experiences of involvement in nature, art, literature, music, or dance to such an extent that they forgot about their surroundings: "Have you ever been completely immersed in nature or in art (e.g., in the mountains, at the ocean, viewing sculpture, painting, etc.) and had a feeling of awe, inspiration, and grandeur sweep over you so that you felt as if your whole state of consciousness was somehow temporarily changed?" "Have you ever acted in a play and found that you really felt the emotions of the character and 'become' him (or her) for the time being, forgetting both yourself and the audience?" "Have you ever focused on something so hard that you went into a kind of benumbed state of consciousness or a state of extraordinary

calm and serenity?" These items and the subjects' hypnotizability were related to a highly significant degree.

As concluded that it is the positive focusing of attention that is important in hypnosis rather than the negative warding off of distractions. It is the absorption of the individual in the cues provided by the hypnotist that enables the subject to become oblivious or inattentive to irrelevant stimuli. This phenomenon resembles the fusion of subject and object reported by many creative artists. This fading of boundaries between the self on the one hand and the outer environment on the other hand facilitates hypnotic experience as well as creative activity.

Creativity and Time Distortion

The pioneer work on time distortion by Cooper & Erickson (1954) is pertinent to the cultivation of creativity. Hypnotic techniques were used to slow the subjective perception of time by 14 subjects. Time distortion was defined as occurring when there was a marked difference between the expected duration of a given interval and the clock reading of the interval. Suggestions were given to imagine oneself performing a certain activity. It was mentioned that a termination signal would be given when the time had expired, but that sufficient time would be available for the completion of the activity.

Work with the individual began by scheduling training sessions several times per week. The ability to lengthen time required from three to twenty hours of training, depending on the subject. Cooper & Erickson found that time distortion ability was associated with a high degree of immersion, by the subject, in the world which was suggested by the hypnotist — and by an accompanying inattentiveness to his actual surroundings. This state of detachment, in which the individual became completely involved in the imaginary experience, constituted the basic goal for the training sessions.

One of Cooper & Erickson's subjects was a college student who exhibited talent in dress designing. She reported that she would customarily work for several hours at a time on from four to ten occasions to design a dress. Under hypnosis, a dress designing task was assigned six times. The subject was awakened immediately after the completion of each trance and asked to draw a picture of the dress and to describe it briefly. For example, one report went as follows:

Experimenter: Where were you?

Subject: I was at home.

Experimenter: How long did you seem to be working at it?

Subject: Oh, about an hour. I was sitting at a table, looking out out of the window and thinking.

Experimenter: Did you do some drawing?

Subject: Yes, after I had thought it all through.

Although the subject experienced the session as an hour in length, the actual time of the trance was 10 seconds. Cooper & Erickson suggested that distorted time could be utilized for creative mental activity in the field in which a subject is adept. The experimenters also called for additional research, noting that their investigation was a pilot study and quite exploratory in nature.

Barber & Calverley (1964) repeated these experiments and did not feel that their results supported the assertions made by Cooper & Erickson. However, the actual technique utilized by Barber & Calverley for inducing the effect was somewhat different from that used in the original study.

Wollman (1965), in an attempt to follow the Cooper & Erickson approach, made use of time distortion with an actor who was offered the lead in a Broadway play one week before opening night. The actor was seen twice a day; time distortion reportedly enabled him to compress a great deal of learning into a short period of time. Practice sessions continued at home after the actor's wife had been trained to serve as a substitute for the hypnotist. The actor was successful in mastering his part and received favorable reviews from the critics on opening night.

Masters (1966) has reported a number of successful attempts to repeat the time distortion phenomenon for creative purposes. In one instance, 125 micrograms of LSD rather than hypnosis was used and the subject, a male psychologist, was informed, without warning, that he would be given a minute of clock time to create a story. He was also told that this minute would be all the time he would need for the task as his subjective experience of time would be slowed down and lengthened. Almost at once, the subject laughed. At the end of a minute, the subject produced a well-constructed short story complete with character delineation and descriptive material:

> By God, it was strange. I have never had an experience like that. Well, it seemed to be the beginning of a novel. It was an English country estate and there was a car. It had a woman sitting in it, a rather middle-aged, attractive but not beautiful woman, and a little dog, and the chauffeur came up to her and — but this is why I laughed. Talk about a writer "getting inside" his characters! First I was inside of this woman, then I was inside the chauffeur, and then I was inside of the dog, and I really could feel my body and my personality change in each case as I became first one and then the other. I tell you, I was really getting into those characters in a very literal sense, but it would take forever, in that way, to do a novel. I recognized this and kind of pulled back and the rest of the time I just observed what was happening, as if I were watching a film. But it wasn't a novel, it was kind of a little, strange vignette, very poignant, and very curious. This woman, you see, was going down to the pier where the body of her husband was being returned to her from some place where he had died. He had been in the diplomatic service. All of the time she is driving down to pick up the body, this little dog is sitting there with her in the back

seat of the big old touring car and is looking from side to side. Both the woman and the dog have perfectly inscrutable faces, so one has no idea at all what she is thinking or feeling. And she meets the ship where her husband's body is being brought off, and a lot of dignitaries are on hand to posthumously give him medals, and there are salutes being fired, and evidently he has performed some great act that this country is honoring him for. She attends the ceremony. Through it all she just stands there, and it isn't possible at all to guess what she is thinking or feeling, and when it is over she gets back into her car. The chauffeur is driving her back to the estate, the little dog is sitting there as before, looking from side to side impassively, not very interested in anything. But then suddenly a rabbit jumps alongside the road. The dog gets very, very excited and causes this woman to notice the rabbit. And then, in an instant, this same woman seems to display a kind of murderous fury and she reaches down and picks up a gun and shoots the rabbit right through the head — and everything freezes for a minute right there — the excited expression on the face of the dog, the curious look of fury on the face of the woman, the rabbit just as its brains are blasted out, only the chauffeur as he was before. This scene just hangs together for a strange, terrible few moments, and then time and movement go back to their normal pace, the face of the woman is entirely inscrutable again, the dog looks from side to side impassively. They turn up into her driveway and the car stops at her house. But you have this strange, frightening sense of that one instant when she and the dog came to life and she blew the rabbit's brains out — that just for a moment something awful had been revealed about this woman and possibly about her relationship to her husband. Although what was revealed is left undefined, you know that there is something latent in her and the inscrutable face and the utterly conventional manner cover something that has the possibility of breaking through.

Island, the last novel written by Aldous Huxley (1962), describes a Utopian realm in which the educational system develops intuitive and problem-solving ability among children by utilizing time distortion. The educators assess each child's ability at an early age and ask:

. . . how suggestible is he going to be when he grows up? All children are good hypnotic subjects — so good that four out of five of them can be talked into somnambulism. In adults the proportion is reversed. Four out of five of them can never be talked into somnambulism. Out of any hundred children, which are the twenty who will grow up to be suggestible to the pitch of somnambulism . . . ? The potential somnambulists are the twenty per cent who can go into very deep trance. And it's in very deep trance — and only in very deep trance — that a person can be taught how to distort time. . . . One starts by learning how to experience twenty seconds as ten minutes, a minute as half an hour. In deep trance it's really very easy. You listen to the teacher's suggestions and you sit there quietly for a long, long time. Two full hours — you'd be ready to take your oath on it. When you've been brought back, you look at your watch. Your experience of two hours was telescoped into exactly four minutes of clock time. . . . For example . . . here's a mathematical problem. In your normal state it

might take you the best part of half an hour to solve. But now you distort time to the point where one minute is subjectively the equivalent of thirty minutes. Then you set to work on the problem. Thirty subjective minutes later it's solved. But thirty subjective minutes are one clock minute. . . . You can imagine what happens when somebody with a genius IQ is also capable of time distortion. The results are fantastic.

Most investigators regard Aldous Huxley's enthusiasm as premature. However, his biologist brother, Julian Huxley (1963), has stated that the use of hypnosis to maximize creativity "is in harmony with the future evolution of man."

Mescaline, Psilocybin, and Creative Artists

A number of creative people claim to have benefited from psychotherapy which utilized psychedelic drugs. Actor Cary Grant attributed "a new assessment of life" to LSD. Blues singer Ronnie Gilbert, in 1964, was mired in a deep depressive state from which she found it impossible to break free. In desperation, she entered LSD therapy and, during the following six months, went through 20 psychedelic sessions. Frequently, Miss Gilbert and her psychiatrist went for walks in the park or visited art galleries and churches.

During one stroll through the park, Miss Gilbert felt a "sense of life all around me; I looked at trees for the first time, really looked at them." She recalled that "everything seemed so rich and so intense." This spontaneous experience (which was not chemically induced) hastened her progress and therapy soon terminated. Several years later she remarked, "I've been turned on to life and have never been so happy."

Miss Gilbert's psychiatrist commented, "Ronnie was lucky. She was one of the people who have been able to work through lifelong problems in a few sessions, and there is no reason why the good results shouldn't stick. Not everybody gets as much out of the experience. She was also lucky because she came into therapy before federal restrictions clamped down on it" (*Cosmopolitan*, August, 1963).

Only five major research projects in the area of psychedelic drugs and creative performance have been reported and most of these have been described by the experimenters as "pilot studies" rather than full-scale experiments with conclusive results. L. M. Berlin (1955) investigated the effects of mescaline and LSD upon four graphic artists of national prominence. There was an impairment of finger-tapping efficiency and muscular steadiness among the four artists, but all were able to complete paintings. A panel of art critics judged the paintings as having "greater aesthetic value" than the artists' usual work, noting that the lines were bolder and that the use of color was more vivid. However, the technical execution was somewhat impaired.

The artists themselves spoke of an increased richness of imagery and of pleasurable sensory experiences. One said, "I looked out of the window into the infinitely splendid universe of a tiny mauve leaf per-

forming a cosmic ballet." Another spoke of "light falling on light."

Frank Barron (1963) administered psilocybin to a number of highly creative individuals and recorded their impressions. One of Barron's subjects stated, "I felt a communion with all things." A composer wrote, "Every corner is alive in a silent intimacy." Barron concluded, "What psilocybin does is to . . . dissolve many definitions and . . . melt many boundaries, permit greater intensities or more extreme values of experience to occur in many dimensions."

Some of Barron's artists, however, were wildly enthusiastic about their apparently increased sensitivity during the drug experience only to discover, once the effects wore off, that the production was without artistic merit. One painter recalled, "I have seldom known such absolute identification with what I was doing — nor such a lack of concern with it afterwards." This statement indicates that an artist is not necessarily able to judge the value of his psychedelically-inspired work while he is under drug influence.

LSD and its Long-Lasting Effects

McGlothlin, Cohen, & McGlothlin (1967) made an intensive study of 72 volunteer graduate students following a preliminary study (1964) which involved 15 subjects. (In the preliminary study, no significant changes in creativity were noted following a 200 microgram LSD session; a number of creativity tests were given before the session and one week after the session. However, some significant changes were reported on anxiety and attitude tests.)

A large battery of psychological tests was administered prior to a series of three 200 microgram LSD sessions, and again at intervals of two weeks and six months following the third session. Among the tests in the battery were three art scales, a measure of artistic performance, a test of imaginativeness, a test of originality, four tests of divergent thinking, and a test of remote associations.

Three groups were created: an experimental group receiving 200 micrograms of LSD per session, a control group receiving 25 micrograms of LSD per session, and another control group receiving 20 milligrams of an amphetamine per session. As there were no systematic differences between the two control groups at the end of the study, they were combined for purposes of comparison with the experimental group.

The most frequently reported change in the experimental group on a questionnaire filled out after six months was "a greater appreciation of music"; 62% of the subjects made this assertion. The increase in number of records bought, time spent in museums, and number of musical events attended in the post-drug period was significantly greater for the experimental group. However, the subjects' scores on the art tests did not show a significant increase; the authors concluded that the data "do not indicate that the increase in aesthetic appreciation and activities is accompanied by an increase in sensitivity and per-

formance."

On the questionnaire filled out after six months, 25% of experimental subjects felt that LSD experience had resulted in enhanced creativity in their work. However, the creativity tests showed no evidence to substantiate this subjective report for the experimental group as a whole or for those claiming greater creative ability.

The other tests in the battery produced provocative results in regard to personality variables and the taking of LSD. The authors reported that "persons who place strong emphasis on structure and control generally have no taste for the experience and tend to respond minimally if exposed. Those who respond intensely tend to prefer a more unstructured, spontaneous, inward-turning (though not socially introverted) life, and score somewhat higher on tests of aesthetic sensitivity and imaginativeness. They also tend to be less aggressive, competitive, and conforming."

On the one measure of artistic performance used (the Draw-A-Person Test), the LSD subjects showed a significant decrease after six months. This may relate to changes in body image.

LSD and Creativity Test Scores

Zegans, Pollard, & Brown (1967) investigated the effects of LSD upon creativity test scores of 30 male subjects chosen from a group of volunteer graduate students. Upon arrival, the first battery of tests was given and certain physiological measures (blood pressure and pulse rate) were taken. A dose of LSD equal to 0.5 micrograms per kilogram body weight was added to the water of 19 subjects randomly selected to receive the drug; the other 11 subjects did not receive LSD. After ingestion, the subject was escorted to a lounge where he relaxed for two hours. Immediately prior to the second half of the test battery (which consisted of alternate forms of the same tests previously given), the physiological measures were repeated. The battery of tests included a measure of remote association, a test of originality for word associations, a test for ability to create an original design from tiles, a free association test, and a measure involving the ability to perceive hidden figures in a complicated line drawing. A tachistoscopic stimulation task was also included to determine speed of visual perception.

When the creativity test data were investigated, it was discovered that the LSD group did significantly better than the control group on the re-test for originality of word associations (a modified form of the Rapaport Word Association Test). Although most other comparisons favored the LSD group, no other results were statistically significant. The authors concluded that "the administration of LSD-25 to a relatively unselected group of people for the purpose of enhancing their creative ability is *not* likely to be successful."

A further analysis of the data demonstrated that the authors were able to predict physiological reactions to a significant degree of accuracy on the basis of previously-administered personality tests. It

was also noted that the LSD subjects (although doing significantly better than control subjects on the word association test) made their poorest showing on those tests requiring visual attention (e.g., the tachistoscopic task, the tile design test, the hidden figures test). It was suggested that LSD "may increase the accessibility of remote or unique ideas and associations" while making it difficult for a subject to narrow his attention upon a delimited perceptual field. As a result "greater openness to remote or unique ideas and associations would only be likely to enhance creative thought in those individuals who were meaningfully engaged in some specific interest or problem."

Mescaline and the Creative Process

The Institute of Psychedelic Research of San Francisco State College employed mescaline in an attempt to facilitate the creative process (Fadiman *et al.*, 1965; Harman *et al.*, 1966). The subjects included professional workers in architecture, engineering, commercial art, furniture design, mathematics, and physics. They were asked to bring to their sessions a problem of professional interest which required a creative solution. A number of subjects had worked for weeks or months on their chosen problems without obtaining a satisfactory solution. It was decided to evaluate the creative output of each subject by means of psychological tests, subjective reports, and the eventual industrial or commercial validation and acceptance of the finished product or final solution.

Following a pilot study in which both LSD and mescaline were used, a formal study was inaugurated. The sessions were individual in nature, each subject working in silence by himself, but with two or three other subjects working in different parts of the room. Dosage for these sessions was 200 milligrams of mescaline, administered in the morning and combined with a psychic energizer. An additional energizer was administered at mid-day. The Purdue Creativity Test, the Miller Object Visualization Test, and the Witkin Embedded Figures Test were administered while the subjects were free from the influence of mescaline and again during the psychedelic session.

The Purdue Creativity Test requests the subject to find as many uses as possible for each of a variety of picture objects. The test is scored for fluency of ideas and range of solutions. The subjects showed an increase for both abilities under mescaline but only in the instance of fluency of ideas was the increase (which averaged 30 percentile points) statistically significant.

The Miller Object Visualization Test asks the subject to envision a two-dimensional outline figure folded into a solid. Most subjects solved these problems by attempting to visualize the figure "in the mind's eye." All of these subjects improved under mescaline. One subject used an analytical approach rather than a visualization approach; his score declined. The other subjects used both visual and analytic approaches; in general their scores improved and they tended to shift to a more

direct visualization under mescaline. The improvement for the group as a whole was statistically significant.

The Witkin Embedded Figures Test involves the distinguishing of a simple geometric figure embedded in a complex colored figure. Every subject but one improved on this measure, some of them as much as 200%; the results were highly significant. There was a shift, on this test, from "field dependence" to "field independence," a shift that previous research has found to be related to creativity.

Questionnaires and subjective reports were analyzed. About half the subjects reported that they had accomplished a great deal more during the session than would have characterized their usual workday. About 20% were not able to concentrate on their project because they were diverted by other psychedelic effects such as personal memories and insights. About 30% fell in between the two groups. All subjects reported positive overall reactions to mescaline.

The subjective reports yielded 11 factors when analyzed: a reduction of inhibition and anxiety under mescaline, the capacity to restructure a problem in a larger context, an enhanced fluency of ideas, a heightened capacity for visual imagery, an increased ability to concentrate, a greater empathy with external processes and objects, a heightened empathy with people, a greater accessibility of unconscious material, an increased motivation to obtain a solution, an ability to associate dissimilar ideas, and a visualization of the completed solution.

The last factor was illustrated by an architect's visualization of a shopping center he was to design:

> I looked at the paper I was to draw on. It was completely blank. I knew that I would work with a property 300 feet square. . . . Suddenly I saw the finished product. I did some quick calculations. It would fit the property and . . . would meet the cost and income requirements. . . . It was contemporary architecture with the richness of a cultural heritage. It used history and experience but did not copy it. . . . I visualized the result I wanted and subsequently brought the variables into play which could bring that result about. . . . I could imagine what was wanted, needed, or not possible with almost no effort. In what seemed like ten minutes, I had completed the problem, having what I considered (and still consider) a classic solution.

Two of the five cited studies suggest that unselected graduate students can not expect an increase in creative ability as a result of their participation in an LSD experiment. On the other hand, creative workers in three studies utilizing psychedelic drugs showed an enhancement of creative functioning. The results must be regarded as tentative until additional work has been done in this field and until a greater control is exerted over the many variables present.*

* An additional study (Janinger, 1967) is being evaluated at the present time. Thirty prominent artists painted a picture of a standard object (an American Indian doll) before ingesting LSD. During their psychedelic sessions, they again painted the doll. The 60 paintings are being evaluated on the basis of several artistic criteria in an attempt to determine what type of change took place as well as the artistic merit (or lack of merit) reflected by the change.

Cohen (1964) summarized the research data on creativity and the psychedelics by stating, "Whether LSD does or does not increase creativity remains an open question. No systematic research is available to help in finding an answer. All that can be said at this time about the effect of LSD on the creative process is that a strong subjective feeling of creativeness accompanies many of the experiences."

Conclusion

A great deal of evidence exists at the anecdotal and clinical level which suggests that the psychedelic state and the hypnotic trance can facilitate the creative act. Much less evidence exists at the experimental level. Three tentative conclusions can be drawn but each demands further data before its validity can be established.

In the first place, alterations in consciousness resulting from hypnosis and the psychedelics share certain characteristics with those mental states associated with creativity. Hypnosis and the psychedelics, for example, often permit access to preverbal impressions, to unconscious material, and to intuitive processes.

Secondly, the therapeutic use of hypnosis and the psychedelics seems to have been especially successful with artists. Perhaps the therapist, in producing an altered state of awareness on the part of his artist patients, not only appeals to their sense of the dramatic but brings about a mental state similar to that in which they have previously functioned at a mature, creative level.*

Finally, it should be noted that the transcendence of culturally-imposed imprints and of societal conditioning always has been a goal for creative persons. Hypnosis and the psychedelics, when used properly, enable artists to stand apart from their culture, at least for a brief period of time. In so doing, they sometimes make an artistic statement that encompasses all cultures, a statement which in time may become a classic painting or poem. For all these reasons, the hypnotic trance, the psychedelic state, and other forms of altered consciousness are worthy of serious study if the act of human creation is to be better understood, guided, and encouraged.

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* Levine, Ludwig and Lyle (1963) have combined psychotherapy, hypnosis and LSD producing a "hypnodelic state" which they have found to be more beneficial to patients than any of the approaches tried alone.

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