

**REALMS OF THE HUMAN  
UNCONSCIOUS**

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**REALMS OF  
THE HUMAN  
UNCONSCIOUS**

**Observations from LSD Research**

**STANISLAV GROF**



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To Joan and my parents

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## PREFACE

This volume is the first of a series of books in which I plan to summarize and condense in a systematic and comprehensive way my observations and experiences during seventeen years of research with LSD and other psychedelic drugs. Exploration of the potential of these substances for the study of schizophrenia, for didactic purposes, for a deeper understanding of art and religion, for personality diagnostics and the therapy of emotional disorders, and for altering the experience of dying has been my major professional interest throughout these years and has consumed most of the time I have spent in psychiatric research.

In 1965, I was invited to participate in an international conference on LSD psychotherapy in Amityville, Long Island, and gave a paper on the experiences I had gathered during almost a decade of LSD research in Prague, Czechoslovakia. During a lecture-journey in the United States after this conference, I was offered an invitation to come to the West on a one-year fellowship from the Foundations' Fund for Research in Psychiatry in New Haven, Connecticut. After my return to Prague, I received a letter from Dr Joel Elkes, Chairman of the Department of Psychiatry and Behavioral Sciences at the Johns Hopkins University in Baltimore, inviting me to come to Baltimore and continue my LSD work as a clinical and research fellow at the Henry Phipps Clinic and in the Research Unit of Spring Grove State Hospital.

When this unusual opportunity occurred, I was deeply involved in my research activities in Prague. I had accumulated detailed

records from many hundreds of LSD sessions and was in the process of analyzing the data, trying to formulate a theoretical framework for understanding the striking observations that I had encountered during my work. By then I had completed the first outline of a conceptual model that seemed to account for most of the findings in my LSD research; this model allowed for the creation of several partial hypotheses that could be put to a more rigorous test. In addition, I became intrigued by the possibilities that LSD psychotherapy seemed to offer for the alleviation of the emotional suffering of cancer patients facing the prospect of imminent death. On the basis of some preliminary observations, I was preparing a special project to explore this new area in a more systematic way.

Dr Elkes' generous offer was too tempting to refuse; I decided to pursue this possibility and ask the Czech authorities for a one-year leave of absence and permission to go to the United States. After many administrative difficulties, this permission was finally granted. When I arrived at Kennedy Airport in March 1967, more than half of my forty pounds of luggage consisted of the records from LSD research that I had conducted at the Psychiatric Research Institute in Prague. My intention, at that time, was to complete the analysis of my data and to perform a controlled clinical study of the efficacy of the technique of LSD psychotherapy that I had developed during many years of therapeutic experimentation. My secret hope was that, in addition, I might be able to carry out at least one of the more theoretical studies testing some aspects of my new conceptual framework.

After my arrival in the United States, it soon became obvious that my plans were highly unrealistic, to say the least. I was astounded by the situation regarding psychedelic drugs that had developed in this country since my first visit in 1965. In Czechoslovakia at the time of my departure, LSD was being legally manufactured by the leading pharmaceutical company sponsored by the government. It was listed in the official medical pharmacopoeia as a therapeutic agent with specific indications and contraindications, together with such

reputable drugs as penicillin, insulin and digitalis. LSD was freely available to qualified professionals as an experimental and therapeutic agent, and its distribution was subject to special regulations. The training required for each LSD therapist more or less followed the psychoanalytic model; it involved a minimum of five training LSD sessions for the applicant and his conducting at least thirty sessions with selected patients under the supervision of an experienced LSD therapist. The general public knew almost nothing about psychedelic drugs, since the reports concerning research with such substances were published almost exclusively in scientific journals. At the time of my departure, there was no black-market traffic in psychedelics and no nonmedical use of them. Anyone interested in self-experimentation could have an LSD session provided it was conducted by an approved professional and in a medical facility.

The situation I found in the United States contrasted sharply with the one described above. Psychedelics had become an issue of general interest. Black-market LSD seemed to be readily available in all parts of the country and for all age groups. Self-experimentation with psychedelics flourished on university campuses, and many large cities had their hippie districts with distinct drug subcultures. The casualties from the psychedelic scene were making newspaper headlines; almost every day one could read sensationalist reports about psychotic breakdowns, self-mutilations, suicides and murders attributed to the use of LSD. At the same time, the psychedelic movement was profoundly influencing contemporary culture – music, painting, poetry, design, interior decorating, fashion, movies, theater and television plays.

The legislative measures undertaken with the intention of suppressing dangerous self-experimentation proved rather ineffective in curbing nonmedical use of LSD but had adverse direct and indirect consequences for scientific research. Only a handful of projects survived under these complicated circumstances. As a result, LSD research was reduced to a minimum and, paradoxically, very little new scientific information was being generated at a time when it

was most needed. LSD and other psychedelics had become a serious national problem; it was difficult to imagine how effective measures could be undertaken without a real understanding of the nature of this problem.

The information about psychedelic drugs spread by the mass media and various agencies was mostly superficial, inaccurate and one-sided. This situation can be attributed, in part, to ignorance and emotional bias and to a desire to discourage and deter the lay experimentation that was flourishing in spite of all of the repressive legislative measures. Such distorted information, since it was unbalanced, disproportional and frequently obviously incorrect, was regarded with suspicion by young people, many of whom found it easy to laugh it off, reject it totally, and ignore the real dangers associated with psychedelics.

Under these circumstances, the prestige of mental-health professionals started deteriorating, especially among members of the younger generation and counterculture. Many psychiatrists and psychologists found themselves in situations in which they were called on as experts to handle various emergencies related to psychedelic-drug use; they were expected to intervene with authority in crisis situations and treat casualties from the psychedelic scene. At the same time, they did not have adequate training and experience in this area, nor was the opportunity available for them to increase their theoretical understanding of psychedelics because of the critical dearth of scientific research.

The situation I encountered in 1967 has not changed substantially in the following years. Hundreds of thousands of people in the United States alone have been experimenting with LSD and other psychedelic drugs; many of them have had frequent, multiple exposures. This self-experimentation has been accompanied by many extraordinary experiences and has often resulted in profound changes in the personality structure, hierarchy of values and world view of the experimenter. The phenomena observed in psychedelic sessions are manifestations of deep areas of the unconscious

unknown to and unacknowledged by contemporary science. The application of existing theoretical concepts and practical procedures to the problems related to psychedelic-drug use has been, therefore, inappropriate, inadequate and ineffective.

Since my arrival, I have been lecturing in various parts of the United States, Canada and Europe for universities, psychiatric hospitals, research institutes, growth centers, colleges and church communities. During these lecture tours, I have found that heterogeneous audiences consistently manifested a deep, vivid interest in the data I was presenting. On many occasions, I was approached by people who wanted more detailed information and asked for book references and reprints of papers from which they could learn more about the problems related to serial LSD sessions. A considerable number of these people were psychiatrists, psychologists, psychiatric nurses and social workers concerned about patients who had problems related to psychedelic-drug use. They wanted to know more about LSD in order to understand the world of these patients, establish better rapport with them, and help them more effectively. I encountered, however, an equal demand for more honest information in many desperate parents, who felt the need to bridge the ever-widening generation gap and gain more insight into the problems of their children. Similarly, a number of teachers and guidance counselors, puzzled by and alienated from their pupils and clients, have expressed interest in unbiased information about LSD. Clerics have also shown a sincere need to fathom the nature of religious and mystical experiences triggered by psychedelic drugs. They hoped that such an understanding, in addition to its philosophical and spiritual relevance, would also help them to be more sensitive counselors for their communities, which are so often vexed by drug problems. On occasion, I have also been approached by lawyers who harbored serious doubts about the adequacy and efficacy of the existing drug laws and wanted to have a clearer understanding of the problems involved. Specialists from various disciplines have asked me for specific details of my observations, because they felt

that these data may have important implications for such diverse areas as personality theory, psychology of religion, psychotherapy, genetics, psychology and psychopathology of art, anthropology, the study of mythology, education, psychosomatic medicine and obstetric practice. Last but not least, most requests for more systematic and comprehensive information have come from people who have had LSD experiences and were looking for clarification of problems they encountered. I have found an unusually vivid and serious interest among members of the younger generation, especially among students.

As I mentioned earlier, my original plan at the time of my arrival in the United States was to complete the analyses of the LSD research data from Prague and to conduct controlled studies that would test some of the new concepts I had developed. I considered the ten years of LSD research in Prague to be a continuing pilot study. This period of time might seem excessively long for orientation in a new field; it has to be taken into consideration, however, that the task involved was nothing less than to draw the first maps of new, unknown and uncharted territories of the human mind.

My decision to write a series of books at this stage of research was brought about by several sets of circumstances. I soon realized that it would be difficult to replicate my European study under better-controlled circumstances at a time when the existing hysteria concerning psychedelic drugs was growing rapidly and was further aggravated by the alarming reports of possible genetic damage related to LSD use. Another important factor was the increasing number of people suffering from serious complications associated with LSD self-experimentation. It seemed that more clinical information about LSD and better understanding of its effects were urgently needed for a more effective approach to such problems. Moreover, the intensity of interest expressed by mental-health professionals as well as by a cross-section of the general public indicated that there was a critical demand for honest and objective information in the area of psychedelic drugs. In addition, some of

the unusual experiences that typically occur in psychedelic sessions have been observed and described with increasing frequency in the context of the new psychotherapeutic techniques and experimental laboratory procedures, among them bioenergetics, marathon sessions, encounter groups, Gestalt therapy, biofeedback, sensory isolation and sensory overload. It seemed that the maps of consciousness developed with the help of a powerful facilitating agent such as LSD could prove useful for organizing and integrating the data from these related areas. My final reason for writing this series of books is based on the conviction that the material from serial LSD sessions even in its present form is of crucial theoretical significance and represents a serious challenge to the existing concepts of contemporary science. I feel that these data should be made available for consideration and evaluation to researchers from various scientific disciplines. For this purpose, I have tried to present the material with much emphasis on actual clinical observations and on illustrative case histories. In this form, it can, I hope, provide an incentive and basis for speculations even for those readers who will not accept the theoretical framework I have suggested for the conceptualization of the observed phenomena.

After much consideration, I have decided to present the findings from my LSD research in five separate volumes. In this book, which is the first part of the intended series, I have summarized the basic information about LSD, briefly outlined various stages of my own psychedelic research, and focused primarily on the 'cartography of inner space' or a phenomenological description of the various levels and types of experiences manifested in psychedelic sessions. The second volume of this series, to be called *The Human Encounter with Death* and co-authored by my wife, Dr Joan Halifax-Grof, and myself, will describe the use of psychedelic therapy in terminal cancer patients and discuss the problem of dying and death from historical, cross-cultural, clinical, philosophical and spiritual perspectives. The third volume will focus on the practical aspects of LSD psychotherapy, such as the preparation of the patient,

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techniques of conducting the sessions, indications and contraindications, the therapeutic results and the problem of side effects and complications. The fourth book will cover some of the heuristic aspects of LSD research and its implications for personality theory, the etiology of emotional disorders, the practice of psychotherapy and the understanding of human culture. The last volume of the series will focus on the philosophical and spiritual dimensions of the LSD experience, with special emphasis on ontological and cosmological issues. It will describe in detail the surprisingly consistent metaphysical system that seems to be emerging from the experimentation with psychedelic substances.



## GENERAL INTRODUCTION

### **The LSD Controversy**

More than a quarter of a century has elapsed since the Swiss chemist Albert Hofmann accidentally discovered the potent psychoactive properties of diethylamide of d-lysergic acid, better known as LSD-25.<sup>17\*</sup> Shortly afterward, this substance became the subject of considerable controversy, which over the years has reached unprecedented dimensions. It seems pertinent to start the discussion of LSD by a brief review of its stormy history.

The discovery of the properties of LSD became a sensation in scientific circles and had a stimulating effect on researchers from many different disciplines. Many of the early papers emphasized the similarities between the LSD-induced 'experimental' or 'model psychosis' and naturally occurring psychoses, especially schizophrenia. The possibility of simulating schizophrenic symptoms in normal volunteers under laboratory conditions and of conducting complex laboratory tests and investigations before, during and after this transient 'model psychosis' seemed to offer a promising key to the understanding of the most enigmatic disease in psychiatry. As a drug that could provide a short, reversible journey into the world of the schizophrenic, LSD was also recommended as an unrivaled tool for the training of psychiatrists, psychologists, medical students and psychiatric nurses. It was repeatedly reported in this context that a single LSD experience could considerably increase the subject's

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\* Superior numbers refer to the Bibliography, pp. 272-3.

ability to understand psychotic patients, approach them with more sensitivity, and treat them more effectively.

The LSD controversy started when the concept of the LSD state as 'model schizophrenia' was seriously attacked by many phenomenologically and psychoanalytically oriented psychiatrists and was eventually rejected by most clinical researchers. It became obvious that, in spite of certain superficial similarities, there were also very fundamental differences between the two conditions. The hope that research with LSD would result in a simple test-tube solution of the mystery of schizophrenia gradually faded and was finally given up entirely.

The 'psychotomimetic' (psychosis-simulating) emphasis in LSD research was soon overshadowed by an increasing number of enthusiastic papers indicating that LSD might have undreamed-of therapeutic potential. According to many clinical researchers, LSD-assisted psychotherapy seemed to allow a considerable shortening of the time required for treatment. In addition, therapeutic success was repeatedly reported in various categories of psychiatric patients who were considered to be poor prognostic prospects or were unresponsive to conventional treatment; these included chronic alcoholics, narcotic-drug addicts, criminal psychopaths, sexual deviants and severe character neurotics. These claims did not remain unchallenged. Many clinicians, knowing how difficult it is to change deep-rooted psychopathological symptoms, not to mention the personality structure, were incredulous of the dramatic effects achieved in a matter of days or weeks. Critics of these reports pointed to the lack of controlled studies demonstrating the usefulness of LSD psychotherapy; however, similar objections were raised at that time in regard to psychoanalysis and other types of widely accepted and practiced drug-free psychotherapy. Most of the criticisms were mainly of a methodological nature, and none of the skeptics seriously questioned the safety of this approach. In this regard, Sidney Cohen's paper published in 1960 demonstrated that the risks associated with the responsible and professional use

of LSD in normal volunteers were minimal.<sup>2</sup> They were slightly higher when LSD was used in psychiatric patients but, in general, LSD psychotherapy appeared to be much safer than many other procedures commonly used in psychiatric therapy, such as electric shock therapy, insulin coma treatment and psychosurgery. By and large, in the early 1960s, LSD seemed to have a firm position in psychiatry as a valuable tool for basic research, psychiatric training and therapeutic experimentation.

In addition, there were at least two other areas in which the use of LSD opened exciting new perspectives and interesting possibilities. Many LSD subjects reported in their sessions unusual aesthetic experiences and insights into the nature of the creative process; they frequently developed a new understanding of art, in particular modern art movements. Painters, sculptors and musicians were able to produce under the influence of LSD most interesting and unconventional pieces of art which differed considerably from their usual modes of expression. It became obvious that experimentation with LSD had important implications for the psychology and psychopathology of art.

Another area in which the use of LSD appeared to be rather revolutionary was the psychology of religion. It had been observed that some LSD sessions had the form of profound religious and mystical experiences quite similar to those described in the holy scriptures of the great religions of the world and reported by saints, prophets and religious teachers of all ages. The possibility of triggering such experiences by means of a chemical instigated an interesting and highly controversial discussion around the issue of 'chemical' or 'instant mysticism' and the validity and spiritual genuineness of these phenomena. The debates carried on by behavioral scientists, philosophers and theologians oscillated among three extreme points of view. Many experimenters felt that the observations from psychedelic sessions made it possible to take religious phenomena from the realm of the sacred, produce them at will in the laboratory, study them, and eventually explain them in

scientific terms. Ultimately, there would be nothing mysterious and holy about religion, and it would be explained in terms of brain physiology and biochemistry. Some theologians tended to view LSD and other psychedelic substances as sacred and the sessions as sacraments, because they could bring the individual in touch with transcendental realities. The opposite trend was to deny that the LSD experiences were genuine religious phenomena comparable to those that come as 'God's grace' or are the result of discipline, abnegation, devotion or austere practices; in this framework, the apparent easiness with which these experiences could be triggered by a chemical entirely disqualified their spiritual value.

In the mid-1960s, when LSD became widely available on the black market and 'street acid' was used by masses of young people as a tool for uncontrolled lay experimentation, new dimensions were added to the LSD controversy. The situation that arose was much different from the rather passionate but basically scientific and academic atmosphere of the discourses of preceding years. Sober and rational arguments almost completely disappeared from the scene, and it was dominated by an emotionally charged hostile encounter between two irreconcilable groups. On one hand, LSD proselytes announced the era of a new religion whose messiah had the form of a chemical. For them, LSD was a panacea for desperately sick mankind, offering the only reasonable alternative to mass suicide in a nuclear holocaust. It was recommended that everybody without exception should take LSD as frequently as possible and under any circumstances; the risks were denied or underestimated and, if admitted, were considered worth taking in view of the final goal. On the other hand, an atmosphere close to mass hysteria was created in the public, which was frightened by this new movement and violently opposed to it. Almost every day sensation-hungry journalists would bring new reports about the horrors and disasters due to unsupervised self-experimentation: people walking out of windows of high-rise buildings into the setting sun, killed while trying to stop automobiles with their bodies, blinded by staring

into the sun for hours, wounded by cutting fat from their bodies with kitchen knives, murdering their lovers and mothers-in-law, or ending up in locked wards of state mental hospitals in a permanently psychotic state. These reports created an image of LSD as a diabolic drug and provided sufficient background for a witch-hunting response from parents, teachers, ministers, police authorities and legislators. Unfortunately, many mental-health professionals participated to some extent in this irrational approach; although the reports of two decades of scientific experimentation with LSD were available in the psychiatric and psychological literature, they allowed their image of this drug to be formed by newspaper headlines.

The association of the drug scene with the 'hippie' movement and the revolt in the counterculture added an important sociopolitical dimension to the already existing problems. The issue was further exacerbated by the conflicting reports about the possible association of LSD with chromosomal and genetic damage, leukemia and cancer. The view of LSD has thus covered a wide range, from a spiritual, emotional and social panacea for mankind and a powerful therapeutic tool for individuals suffering from serious mental and psychosomatic disorders to a vicious enemy causing organic brain impairment and serious physical and mental damage to the individual and endangering the well-being of future generations. To complete the controversial picture of LSD, it should be mentioned that this drug had been seriously considered as an effective adjunct to brainwashing techniques and a powerful means of chemical warfare.

The atmosphere of hysteria, together with the lack of serious research, has made it very difficult to realize the scientific importance of many of the phenomena involved in this controversy. Lay self-experimenters with LSD frequently enter realms of experience that totally bewilder and puzzle practicing psychiatrists and psychologists who are called in to handle emergency situations related to that drug. On one hand, the LSD experiences do not fit any existing theoretical system; on the other hand, many sensitive

clinicians realize that it is inaccurate and inappropriate to label LSD experiences simply as psychotic. In addition, as a result of such experimentation, many people have undergone dramatic personality changes, involving the hierarchy of values and religious and philosophical beliefs, as well as general lifestyle. Lacking a theoretical framework to explain the mechanisms involved, professionals who occasionally have had the opportunity to witness these transformations have found them incomprehensible. Even some of the negative occurrences following the ingestion of LSD, such as psychotic breakdowns or attempts at suicide, could provide important data about the dynamics of these phenomena if approached scientifically rather than emotionally.

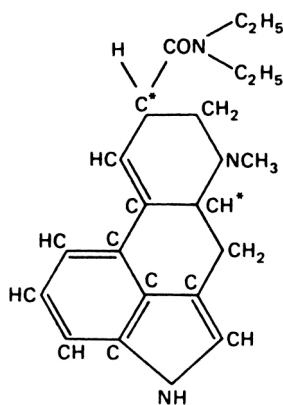
If we consider the nature and scope of the LSD controversy, it seems obvious that it reflects something much more fundamental than the pharmacological effects of a single chemical agent. Although all the discussions appear to be about LSD, other issues implicit in such exchanges give them their emotional charge. Several decades of LSD research have uncovered much evidence concerning the nature of the common denominator responsible for this situation. As will be illustrated in the following chapters, careful analysis of the LSD data strongly indicates that this substance is an unspecific amplifier of mental processes that brings to the surface various elements from the depth of the unconscious. What we see in the LSD experiences and in various situations surrounding them appears to be basically an exteriorization and magnification of the conflicts intrinsic to human nature and civilization. If approached from this point of view, LSD phenomena are extremely interesting material for a deeper understanding of the mind, the nature of man, and human society.

### **LSD and Its Effects in Human Beings**

In recent years, LSD has become increasingly well known. Information has been fed to the general public through the daily press,

articles in various magazines, books, antidrug propaganda pamphlets, radio broadcasts, television programs and movies, as well as hearsay. Most adults and young people have been exposed to the LSD lore. However, most of this information has not been very systematic, to say the least, and much of it has been biased and distorted by commercial and political interests. For this reason, I will give a brief synoptic review of the basic data on LSD as a general descriptive background for further discussions. Such an introduction should be useful for a better understanding of some of the more specific, dynamic aspects of the LSD experience, which constitutes the major contribution of this study.

LSD-25, or diethylamide of d-lysergic acid, is a semisynthetic chemical compound; its natural component is lysergic acid, which is the basis of all major ergot alkaloids, and the diethylamide group is added in the laboratory. According to Stoll, Hofmann and Troxler,<sup>18</sup> it has the following chemical formula:



LSD, as such, has not been identified in any known organic substances although the natural production of LSD has been suspected to occur in the brains of animals infected by toxoplasmosis.<sup>19</sup> The synthesis of various other amides of lysergic acid has been demonstrated in submerged cultures of the fungus *Claviceps paspali*.<sup>1</sup>

Similar amides have also been found in morning-glory seeds (*Rivea corymbosa*), which, for centuries, have been used in Mexico for ritual purposes in the form of ointments and potions called *ololiuqui*.<sup>3</sup>

It is interesting to recall that LSD was first synthesized in 1938 in the Sandoz laboratories in Switzerland by Stoll and Hofmann as a drug possibly useful for obstetrics and gynecology and in the treatment of migraine headache. It was subjected to routine laboratory testing in animals and found to be uninteresting, and its study was discontinued. The hallucinogenic properties of LSD were discovered by Albert Hofmann approximately five years later, in April 1943.<sup>17</sup> Reviewing the results of the early research with this substance, Hofmann concluded that the data suggested the possibility of an interesting stimulating effect on the central nervous system. While synthesizing a new sample of LSD for further studies, he accidentally intoxicated himself during the purification of the condensation products and experienced very dramatic psychological changes. He was able to make the hypothetical link between his abnormal mental condition and the drug he was working with; later, he intentionally ingested 250 micrograms of LSD to put his suspicion to a solid scientific test. His reaction to this dose was very similar to his first experience but much more intense and dramatic. A minute quantity of LSD drastically changed Hofmann's mental functioning for a period of several hours; he spent this time in a fantastic world of intense emotions, brilliant colors and undulating forms. Hofmann then described his unusual experiment to Stoll, of the psychiatric clinic in Zurich, who was sufficiently interested to run the first scientific study of LSD in normal volunteers and mental patients.<sup>17</sup> His observations of the LSD effects in these two categories of subjects were published in 1947; this communication evoked enormous interest and stimulated further research in many countries of the world. Subsequent studies confirmed Stoll's findings that LSD was the most powerful psychoactive drug ever known. In incredibly minute dosages, starting from 10 to 20 micrograms (1 microgram or gamma = one millionth of a gram), it could produce



very profound and variegated mental changes lasting several hours. Thus, LSD was approximately five thousand times more effective than the already-known mescaline and one hundred and fifty times more effective than the later-discovered psilocybin.

It was established by further research that LSD can be administered by any of the common routes. It can be taken orally and injected intramuscularly, intravenously, intraperitoneally or directly into the cerebrospinal fluid in the vertebral canal. There seems to be an unusually wide range within which LSD can be used safely. Acute and chronic toxicity studies of animals indicated that LSD has a low toxicity level and a large safety range; in clinical experiments, the dosages administered without any detectable biological side effects ranged between 10 and 2000 micrograms.

The onset of the LSD reaction follows a latency period, the duration of which can vary in the extremes between ten minutes and three hours, depending on the individual, mode of administration, dose, degree of psychological resistance and other variables. This latency period does not exist when LSD is administered directly into the cerebrospinal fluid. In this case, its action is almost immediate. An uncomplicated LSD session can last between four and twelve hours; the most important factors determining its duration are the personality of the subject, the nature and dynamics of the unconscious material activated during the experience, and the dosage used. Prolonged reactions, which occasionally occur during LSD work, can last for days or weeks. The intensity of the LSD experience can be mitigated by opening the eyes and moving around and can be deepened by staying in a reclining position, using eyeshades and listening to stereophonic music. The LSD phenomena cover an extremely wide range and occur in almost all areas of mental and physical functioning. They will be only briefly outlined here.

*Physical symptoms* are a typical, standard aspect of the LSD reaction; most of them can be understood in terms of the stimulation of the vegetative (autonomic), motor and sensitive nerves. Vegetative manifestations can be of a sympathetic nature, a parasympathetic

nature, or both. Sympathetic effects involve acceleration of the pulse rate; increase in blood pressure; dilation of the pupils; blurring of vision and problems in focusing; secretion of thick saliva; profuse sweating; constriction of arteries in the periphery, resulting in coldness and blue color of hands and feet; and erection of body hair. Parasympathetic effects are retardation of the pulse rate, lowering of the blood pressure, hypersalivation, secretion of tears, diarrhea, nausea and vomiting. Also frequent are symptoms of a more general nature, such as malaise, flu feelings, fatigue and alternating chills and hot flushes. The most common motor phenomena include increased muscular tension; a variety of tremors, twitches and jerks; or complex twisting movements. Although the above phenomena are more common, some subjects can also experience a total and complete relaxation of all muscles in the body. Besides the vegetative and motor manifestations, a number of different changes in neurological reflexes have been described in LSD subjects. Symptoms associated with the activation of sensitive nerves are headache, pains in various other parts of the body, feelings of heaviness in the extremities, a variety of strange sensations, and sexual feelings.

*Perceptual changes* are the most frequent and constant part of the LSD reaction. Although they can occur in any sensory area, there seems to be a definite predominance of visual phenomena. They range from elementary visions of flashing lights, geometrical figures and illusory transformations of the environment to complex images involving groups of persons, various animals and specific scenery. Less frequent are perceptual changes in the acoustic area. Typical are hypersensitivity to sounds, difficulty in differentiating among various auditory stimuli, acoustic illusions and pseudohallucinations. Olfactory and gustatory changes are rather common in normal subjects and psychiatric patients; they can dominate the sessions of people with congenital blindness, who usually do not experience optical phenomena after the administration of LSD. Typically, smell and taste are inhibited during the