Modifications in the Technique of LSD Therapy

By A. M. SPENCER

SANDISON, SPENCER AND WHITELAW (1954) gave a detailed account of the procedure they employed in the therapeutic use of LSD. Since that time the drug has evoked considerable interest but is only now beginning to gain acceptance by an appreciable number of practitioners. Its history as a psychiatric therapeutic agent has been the opposite of most such agents of recent years. In place of an enthusiastic beginning with considerable promotional advertising, LSD has been used by a comparatively small number of workers mainly in the USA and England and has had no promotional advertising. Most psychiatrists have rightly been sceptical of results claimed for it as it has never been the subject of a double blind clinical trial. There appears to be no theoretical reason why such trials should not be arranged, although the practical difficulties are considerable and will be dealt with later in this paper.

Largely because it has been used by relatively few therapists, little research has been done on the problems of the treatment situation under which the drug is given. This paper describes the author's method of treatment in the LSD Unit at Powick Hospital. This Unit was purpose-built for LSD therapy in 1958. Financial considerations severely limited the size and amenities of the Unit which consists essentially of five single rooms, opening off a relatively wide corridor with a nurses' bay and toilet facilities. The rooms are well lit with large windows fitted with venetian blinds. They are moderately soundproof with thickened doors having 22" x 12" glass panels. Each room has a divan bed, bedside table, chairs and wardrobe and is fitted with a bedside bell which the patient uses to call the nurse whenever he wishes. The wall on one side of the room has been entirely covered with green 'blackboard' paint for the patient to write or draw on with the chalks provided if he wishes to.

Literature on LSD

Buckman (1962) has collected a bibliography of over 3,000 items dealing with LSD since Stoll's (1947) first paper on the subject. Most of the items deal with experimental work and papers on therapeutic techniques are relatively few. In 1959 the Josiah Macy Jr. Foundation sponsored a conference on LSD at Princetown, N. J. This conference was attended by the leading workers wtih LSD in the USA, together with R. A. Sandison of England and C. H. Van Rhiyn of Holland. The proceeedings of the conference were published by the Foundation under the title "The Use of LSD in Psychotherapy" (1960). This publication should be consulted by anyone contemplating the use of LSD. It not only contains a wealth of experimental and clinical information, but shows that many of the participants in the conference had by 1959 modified their views as expressed in their previously published papers.

Techniques are still constantly changing as workers with the drug gain experience and develop their own methods of treatment. Few papers of importance on the therapeutic use of LSD have appeared since the issue of "The Use of LSD in Psychotherapy" but the following should be mentioned: Ling and Buckman (1960), Bierer and Browne (1960), Chandler and Hartman (1960).

Signs and Symptoms of the LSD Reaction

These have been described many times and will not be detailed again here. The therapeutic use of the drug depends upon its capacity to cause unconscious material to emerge into consciousness, i.e. it is an abreactive drug. Many other phenomena such as hallucinatory experiences in which everything in the room is tinged with certain colors, or in which the patient sees various images, especially eyes on the walls, distortions of the body image, etc., are *unwanted* effects of the drug. They are, however, as much a part of the effects of LSD as the recovery of childhood memories. Whatever the site and nature of the action of LSD, the drug can only be regarded as producing a blunderbuss result, some of its effects being therapeutically valuable, some of them however, being disturbing to the patient and of no value to the therapist.

That LSD causes the emergence of unconscious material accounts for its not having gained wider acceptance as a treatment for neurotic illness. Many therapists, perhaps because of their own unconscious fears, prefer to leave their patients' unconscious alone and to deal with neurotic symptoms by treatments of the opposite kind, such as tranquillizing drugs by which the containment of the unconscious is greatly increased. Further, many therapists, while not opposed to the direct release of unconscious material during therapy feel that the management of the unconscious material released by a drug such as LSD is beyond their competence. Such an attitude must be respected since, as will be discussed later, the management of the unconscious material released by LSD is often fraught with considerable difficulty if not danger. This is an aspect of LSD therapy which has not yet been fully worked through. It would seem to account for the number of therapists who, trying out the drug under unsuitable conditions, are surprised at the nature of the unconscious material produced and beat a hasty retreat from a treatment situation with which they cannot cope. It is understandable that such therapists later report that they found the drug of no value in treatment.

Since the therapeutic use of LSD depends upon its capacity to cause the emergence of unconscious material into consciousness, it can be used in either of two ways:

(a) as an adjuvant to analytical therapy

(b) primarily for its peculiar properties as an abreactive drug.

LSD as an Adjuvant to Analytical Therapy

This appears to be the chief use to which the drug has been put in the

USA, where psychiatry, particularly in private practice, is in many ways almost synonymous with psychodynamics of the Freudian School. Abramson (1955), (1956) and (1961) gives verbatim accounts of interviews with patients in whom the drug was used as an adjuvant to psychotherapy. Used in this way only small doses from 10 μg–75μg are usually necessary. Enough unconscious material is produced to last the analyst a considerable time, and this material he can interpret according to his own particular school. In addition, if the drug is given at weekly intervals for a few weeks most patients start dreaming intensively, thus producing more material for the analyst. LSD is also helpful in cases where an orthodox analysis has become 'blocked' as one or two doses of the drug often enable the patient to 'start' again. Patients under analysis say that the unconscious material produced under LSD is frequently far more vital and meaningful for them than is the material produced under normal analytical conditions.

As an adjuvant to analysis, however, LSD is not a very satisfactory drug. Its side effects can be disturbing for the patient, even with considerable reassurance. As will be seen, its action can be very uncertain; not only does it sometimes appear not to act, but at other times, even in small doses, its action may be too prolonged. Generally, for this purpose the shorter acting psilocybin seems to be the drug of choice—it gives the analyst everything that LSD does with fewer disadvantages.

LSD as an Abreactive Drug

The chief value of LSD lies in its use as an abreactive drug. Its properties in this respect appear to be unique. No other drug seems to equal it either in the vividness or feelings of reality with which repressed experiences are brought into consciounsness nor in the levels, natal and pre-natal at which these experiences are relived with the patient's body image diminishing to the size he was at the time of the original traumatic incident. One oral dose of the drug can enable the patient to relive repressed experiences for periods of up to eight hours duraion—this despite the fact that there are patients who are completely resistant to the drug or in whom LSD by itself cannot produce the adequate emergence of unconscious material. So far, it is the only abreactive drug which enables an ambulant patient to react without the unwanted encumbrances of face masks, continuing intravenous injections, etc., and to conduct himself in what may be termed a normal environment.

Few drugs have a single unified action under all circumstances. The effects of many drugs vary with the environment within which they are given. This is especially true of drugs which affect human behavior, in particular, the earliest and most widespread of all abreactive drugs—alcohol. It is also true, however, of drugs which do not primarily affect behavior. Pitressin for instance, acts as a diuretic in the anaesthetized hydrated animal; in the alert hydrated animal it acts as an antidiuretic, but in the alert, dehydrated animal it is again a diuretic. The same drug in the same dosage can cause a diametrically opposite physiological response if the experimental conditions are different (Fremont-Smith, 1960). It is, therefore, necessary in

discussing LSD therapy to describe the environment within which the drug is administered.

The environment in this connection consists of two main parts:

A. The attitude of the therapists towards the drug and the patient.

B. The physical conditions under which the drug is given.

The Attitude of the Therapists towards the Drug and the Patient

The author's view is that treatment with LSD is a form of individual and group therapy administered by a team of therapists, with the transference situation greatly enhanced by the LSD which causes the patient to regress to an infantile state corresponding frequently to the early months of life and sometimes to the pre-natal stage; that the patient needs father and mother surrogates during treatment and that the general therapeutic attitude should be one of acceptance of the patient as a person, in a non-critical, supportive treatment situation; that LSD reactivates in consciousness, patterns of neural activity (engrams) which in infancy had become associated with anxiety caused by frustration, rejection, etc. If this reactivation of the neural patterns takes place in an 'accepting' environment the engram readjusts itself to a more 'mature' pattern free from abnormal amounts of anxiety, and reconstruction of the personality of the patient follows. LSD therapy is therefore regarded primarily as a 'retraining' or 'reconditioning' therapy and not primarily as a 'psychological' form of treatment. Analytical concepts such as personal and racial unconscious, ego, id, superego, must have physical substrates if they are to have any validity, although the measure of identity between the psychological concept and its physical substrate is at present a matter of opinion. The author believes them to be one and the same even though, of course, very little is known, as yet, about the physical substrates of such psychological concepts. The term 'LSD' reaction' is therefore preferred to that of 'LSD experience' as belonging more properly to the discipline of pharmacology.

Because LSD is regarded primarily as a 'retraining' or 'reconditioning' treatment, much importance is attached to dealing with the re-experienced repressed traumatic memories in the light of the patient's present 'here and now' environment. In particular the patient's position within the family group is regarded as important and increasingly, the family rather than the individual patient is looked upon as the 'treatment unit.' This helps towards the solution of what is a recurring problem with patients having LSD, namely, that the spouse of a married patient, or the parents of a single patient are unable to adapt themselves to the increasing maturity of the patient as treatment proceeds. Sometimes wives ask if they may sit with their husbands while the latter are having treatment. Previously, the author allowed this, particularly as the husbands said it would be a great comfort if their wives could be with them. Generally, however, the experiments were unsuccessful if not positively harmful to the patient's recovery. Either the wife unconsciously used the treatment situation to continue her dominant role or her presence prevented the patient from abreacting traumatic material which he

regarded as potentially hurtful to his wife. This applied particularly to the initial solitary phase on the patient's treatment days. During the outgoing phase, 6–9 hours after ingestion of the drug, the position is slightly different but even here care has to be exercised if spouses are admitted to the group. LSD induces a considerable feeling of group cohesion and to introduce a spouse during the outgoing phase of the drug's action is rather like inviting a sober person to an alcoholic party which is well under way. The group cohesion tends to break down at the end of the day and it is better to assist the other members of the family to accept the maturing personality of the patient as they meet it outside the actual treatment situation rather than for them to participate in the treatment situation itself.

The Therapeutic Team

The author regards himself as the group leader of a therapeutic team which seeks to meet the patient's emotional needs in the 'here and now' of the active treatment situation and in the 'here and now' of the patient's home environment. Psychiatric nurses normally confine their activities to the hospital in which they work and do not usually visit patients in their own homes. It is therefore necessary to call on other workers to help the patient and his family adjust themselves to the changing conditions caused by the patient's maturing personality. This help may be given by:

(a) the doctor himself, in frequent interviews with the patient and his family on non-treatment days;
(b) psychiatric social workers, who either sit in with the patient during treatment and visit the patients' homes in between treatments;
(c) psychiatric social workers, probation officers and other suitable case workers who visit the patient's home between treatments although they cannot sit with the patient on treatment days because of other demands on their time.

This approach to the treatment situation recognizes that while he is undergoing treatment the patient can be in a transference relationship with more than one therapist. The arrangement has definite advantages over the patient having a transference relationship with only one therapist (Spencer (1963)) provided that the therapists work as a team and are able to deal with countertransference problems which inevitably arise. The doctor is the therapist only in so far as he is the group leader of a therapeutic team. Of equal importance are the other members of the team as outlined above and whose functions will now be described in greater detail under the headings of The 'Here and Now' Situation of Treatment Days and The 'Here and Now' Situation within the Family.

The 'Here and Now' Situation on Treatment Days.

Normally, the patient is looked after by a member of the nursing staff on treatment days. The staff/patient relationship in LSD therapy makes more demands upon the staff than is probably the case in most other treatments. During the height of the reaction patients are 'little children' making

their insistent, unsatisfied demands upon the staff who are their parent surrogates. If at all possible one nurse mother-surrogate should be allocated to each patient for the whole of the time the patient is under treatment. This may seem as unnecessarily high staff/patient ratio, but it is desirable on two grounds.

In the first place the re-living of frightening, traumatic scenes from early childhood or the re-experiencing of early negative relationships can in itself be a further traumatic experience for the patient if he has to go through such an experience on his own, apparently neglected and rejected by the staff with whom he is in a transference relationship. Unfortunately this high staff/patient ratio can rarely be attained, but it must be recognized that bells which the patient can ring for the nurse are an inadequate substitute for the presence of the nurse herself. Some patients fight against ringing the bell as they regard their doing so as a sign of weakness and dependence or of 'troubling' the nurse, whereas if the nurse is constantly present, the patient can slip into the therapeutic state of dependence instead of continuing in the unhelpful state of indecision as to whether he will ring the bell or not.

Secondly, some patients find that they can only regress into an infantile state with the emergence of repressed memories if a second, reassuring person is present. In the absence of such a person the patient feels only a vague sense of restlessness and fear, which passes immediately into some repressed memory of childhood when the nurse enters the room.

Ideally, members of the nursing staff of the LSD Unit should be trained psychiatric nurses. Until an adequate supply of such nurses is available, however, much help can be given, provided they have the necessary preliminary instruction by untrained, mature, married women who often have a flair for the personal relationship involved in the treatment.

Provided sufficient nurses are available, it will probably suffice for the doctor to see a patient for 20–30 minutes on the day of treatment. As in the case of the nurse his role will be an active, positive one. Through his general attitude of acceptance of the patient as a person and by definite repeated suggestions, he will seek to retrain the patient so that the conditioned rejection of the patient by himself because of his early unacceptable feelings of hostility towards the frustrating, rejecting adults around him, will be replaced by a condtioned acceptance of the patient by himself as he finds he is accepted, for all his negative feelings, by his therapists. It will thus be seen that the author encourages all members of his therapeutic team to make active, positive suggestions to the patient in the 'here and now' of the treatment situation. All treatment situations, even those in which physical treatments like ECT are given, have a factor of suggestion in them which either helps or retards the patient's recovery and it is the author's overt policy to use every possible positive suggestion as part of an active treatment programme to assist his LSD patients in this learning of adequate responses in place of the neurotic ones they were previously troubled with.

In a few cases, the services of the psychiatric social workers have been utilized on the day of treatment in place of members of the nursing staff,

but generally they have been more frequently used in helping the patient/family adjustment on the days in between treatments.

Unfortunately the physical structure of the LSD Unit at Powick Hospital does not lend itself to anything more than simple group therapy during the outgoing phase of the day's treatment, and there is considerable scope for more active group discussions, psychodrama, etc. during this phase.

The 'Here and Now' Situation between Treatment Days

Because the family is regarded as the functional treatment unit, the author considers that the ideal LSD therapeutic team should include case workers who can visit the patient's home in between the treatment days. Not only do some patients find they can discuss their LSD reactions more freely on the day after treatment than on the day itself, without feeling any need for acting out, but case workers can assist materially in the adjustment of the patient/family relationships which develop as a result of the patient's treatment. The maturing of the patient's personality under treatment brings with it problems for the other members of the family, who themselves need help if they are to accept the by no means always welcome changes in the patient's attitudes. This is particularly so for the spouses of patients. Not infrequently both patient and spouse have married for predominantly neurotic reasons and the emotionally maturing LSD patient may find his basically neurotic partner inadequate for him. It has been possible on occasion for the case worker to convince the spouse of his or her own need of treatment and husband and wife have then continued treatment together.

The author has had assistance from members of the hospital psychiatric social workers department as case workers and although one psychiatric social worker probably cannot have a case load of more than four patients if time is to be allowed for non-LSD case work, the results more than justify the time-consuming nature of the treatment for highly trained personnel.

The author has also had the help as case workers of the probation officers who initially referred the patients from the Courts for psychiatric treatment. The probation officers have not been able, because of exigencies of time, to sit in with the patient during treatment, but their case work in between treatments has been invaluable. Occasionally a patient's family doctor has seen the patient regularly between treatments but again other demands usually prevent general practitioners from actively assisting in the treatment.

A final example of the need for ensuring that the patient's 'home' environment is fully taken account of may be cited. A nun from an enclosed convent was admitted to hospital because of her aggressive behavior towards the other nuns. She was a deeply disturbed hysteric with many sexual fantasies. Her early parental home has always been unstable and finally broke up on the death of her mother when the patient was eight years of age. She had then gone to a Convent Orphanage and from there had passed as a lay sister at the age of 18 directly into the enclosed convent, in which she had spent 30 years and from which she was admitted to the hospital. She

was intensely rebellious against all forms of authority and it was feared that under LSD and in the non-religious atmosphere of the hospital she would reject the form of living she was accustomed to in view of its marked authoritarian nature. Had she done so her rehabilitation would have been extremely difficult if not impossible. Fortunately one of the 'extern' sisters of the Convent was medically qualified and arrangements were made for her to sit with the patient on her treatment days. She was able to reassure the patient that her deep-seated feelings of aggression and sexuality did not make her the less acceptable to her Church. Treatment lasted some twelve months at twice weekly intervals, but the patient was able to return to the Convent as a fully participating member of the community, a result which could hardly have been achieved without the 'extern' sister's help and guidance.

Physical Conditions under which LSD Treatment is Given

In the light of his experience, the author now regards LSD treatment as a combination of individual and group psychotherapy in which the drug is used to enable the patient to regress to an early infantile level. Before the LSD Unit at Powick Hospital was built a number of patients were given LSD in single rooms in the wards with a minimum of nursing and individual care, but the results of this treatment, as might be expected, were so poor that this form of treatment was abandoned and the present therapeutic approach substituted for it. This point is empasized as the author considers it important that in any controlled trial of the effectivness of LSD (Robinson et al., 1963) the conditions under which the drug is given should be described in adequate detail. As mentioned earlier the present LSD Unit at Powick Hospital suffered from being subject to considerable financial stringency and from the fact that although it was completed in 1958 it was designed in 1953 when experience of LSD was still relatively limited. Since that time, the following principles of treatment have become relatively important:

A specifically designed focus point for treatment appears to be essential. Many patients come either from broken homes or are illegitimate so that they have never had a continuing physical habitation in childhood. If they have had such a habitation it has become associated in their minds with the negative feelings of rejection and hostility aroused by quarrelling and rejecting parents. The physical form of the building in which LSD is given can help to provide such patients with a feeling of security denied them by their earlier rootlessness. This is particularly true of outpatients who find it difficult to become identified with an inpatient ward. This is not merely a function of ward staffs and inpatient/outpatient relationships. Most psychiatric wards are too big and anonymous for LSD therapy. Inpatients having LSD can sometimes identify themselves with the ward as a whole although more frequently they tend to form a sub-group within the ward, a situation of which the phrase 'LSD' patients' is probably a recognition. Sometimes inpatients treated in their own wards will make their way to the LSD Unit during the later outgoing phase of the day's treatment and the author has not found it

practicable to treat more than a few outpatients in an inpatient ward as their gravitating to the LSD Unit towards the end of the day induces ward/LSD Unit tensions. The physical setting for LSD treatment therefore needs to be as 'homely' as possible and nursing procedures necessary to such activities as preparing injections should be made as inconspicuous as possible.

Any building used for LSD therapy needs to cater to:

a) the early withdrawal phase when patients usually like to be in single rooms on their own.

b) the later outgoing phase when group activities are possible.

The rooms require to be moderately soundproof so as to exclude extraneous noises to which patients under LSD are susceptible. The door of each room should have a fairly large glass panel in it so that the patient can feel in touch with what is going on in the Unit. The individual rooms for the patients need to be arranged around the centre for group activities and the author regards the layout shown in figure 1 as being suitable for utilizing the LSD treatment situation to the best advantage. All the individual rooms open directly on to the group activity centre which is adequately lit by lantern lights in the roof. Ten patients would seem to be the optimum number for such a group.

Disadvantages of LSD

Within any treatment centre including that outlined above, LSD has a number of disadvantages. The usefulness of the drug in suitable cases is so considerable that a proper understanding of the difficulties associated with its use is essential if the drug is not to fall undeservedly into disrepute. These difficulties are chiefly the unpleasantness of thereaction, including the non-specific anxiety produced by the drug and the need of some patients for 'acting out' when under its influence; the uncertainty of the drug's reaction including its inability to produce a break-through of unconscious material in all cases and finally, the fact that no effective antidote to LSD has yet been found, so that termination of the drug's action is sometimes difficult if not impossible.

The Unpleasantness of the Reaction

(a) *Non-Specific Anxiety.* A great deal of non-specific anxiety is released by LSD before the emergence of unconscious material takes place. It is uncertain how far the production of this non-specific anxiety is an essential preliminary to the emergence of unconscious material. It may be an increase in the patient's normal free-floating anxiety or perhaps the first effect of the LSD on the neural patterns which form the physical substrate for the repressed memories. Only later, after the reactivation of the neural patterns has continued for some time, does the memory trace itself rise into consciousness. The non-specific anxiety can be neutralized to some extent by giving 10 mgm. of methyl-amphetamine hydrochloride orally (Ling and Buckman, 1960). It is not known whether methyl-amphetamine given in this way prevents the emergence of unconscious material. If its effect is to prevent the

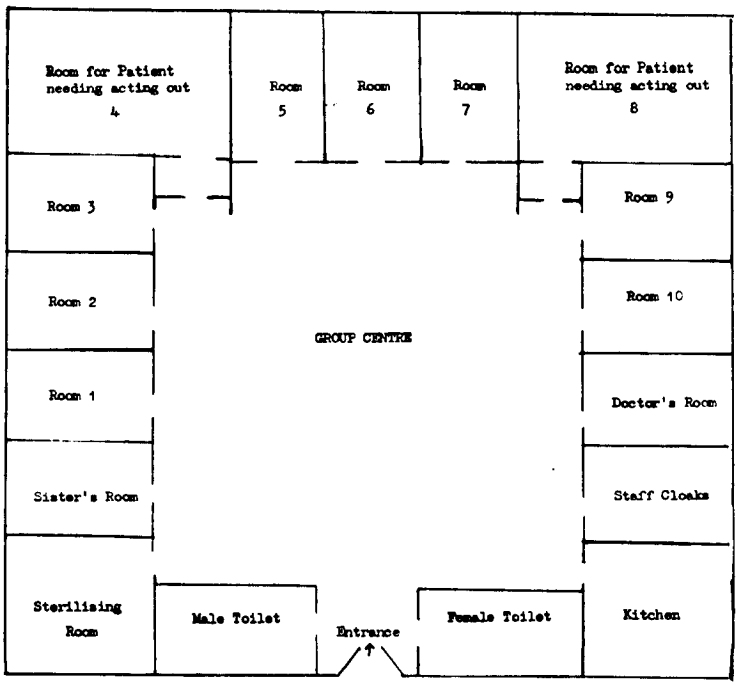

Fig. 1.—Suggested LSD Therapy Centre.

LSD from acting on the neural synapse, then the reduction of anxiety must be obtained at the cost of reduced abreactive effect on the part of the LSD. If, however, the methyl-amphetamine reduces the anxiety by neutralizing the chemical substances producing it, after they have themselves been formed by the action of the LSD, the anxiety may be diminished without the continuing reactivation for the memory trace being reduced in any way. Abramson and Sklarobsky (1960) found that predisone 40–165 mgm., an adrenergic drug, administered for 3–7 days before LSD in a dosage of 25μg–50μg either reduced or eliminated anxiety in 4 out of 5 subjects without changing the symptomatology of the LSD reaction in any other way. Certainly methyl-amphetamine reduces anxiety when given without LSD, but which of the above explanations is correct must await further research.

The non-specific fear may also be controlled to some extent by the administration of a short-acting barbiturate such as 100 mgm. or 200 mgm. of pentobarbitone about one hour before the LSD is given. Another drug which may be used is a Sandoz research product—No. UK 738. This is a parasympatholytic drug which, given in a dose of 2 mgm., not only partially allays the non-specific anxiety but also prevents the vomiting which follows the addministration of LSD in a number of patients. This vomiting can be severe and extremely distressing to the patient. Patients of an obsessive-compulsive temperament seem particularly prone to it and the use of UK 738 has enabled some patients to continue with LSD therapy who would otherwise have had to abandon it because of the vomiting induced.

(b) *The Need for 'Acting Out'*. One of the characteristics of LSD is the vivid nature of the experiences through which the patient goes as his repressed memories emerge into consciousness. He not only remembers that he once struggled and fought against his mother as she frustrated him, but he becomes in the present, the struggling, frightened, frustrated child—only now he has the physical equipment of an adult. It is one thing for a child of two to say to his father "I'll hit you, if you don't give it to me" and quite another for an adult man, regressed under LSD to the age of two, to say to the therapist, "I'll hit you" and then to do so. Such a situation epitomizes a difficulty at the heart of LSD therapy, namely, that we are ill-equipped to cope with the contents of the unconscious when they emerge.

The degree to which patients find it necessary to act out their recovered memories varies considerably. Many patients particularly those above average intelligence and with good ego structure find it unnecessary to do any acting out at all. In general, it may be said that the need for acting-out is in inverse ratio to the amount of ego structure the patient has been able to develop. One of the benefits of LSD therapy is that it enables patients to increase very considerably the amount of ego-formation. It is one of the few treatments which can do this and it would appear to be a serious limitation to the treatment's usefulness, if it has to be confined to patients who find it unnecessary to do any acting out.

Acting out usually has a large aggressive component. The patient has an irresistible urge to smash the windows of his room, break the furniture or crockery, tear the bedclothes and assault the members of the staff or other patients. Some patients' aggression is directed internally and they make suicidal gestures, not usually of a serious kind. Others find their treatment room too claustrophobic and rush out, returning on their own after a time. Such patients are difficult to treat in urban clinics, because of the dangers they become exposed to in present-day traffic conditions.

It is important that this question of acting out should be seen in its correct perspective as more than anything else it is likely to bring LSD into disrepute. A number of considerations are relevant.

In the first place, psychiatrists' training inclines them to dislike overt aggressive behavior and to adopt repressive methods when it occurs. The psychiatrist working in a general hospital tends to transfer to the psychiatric hospital patients who are 'difficult' while in some psychiatric hospitals padded rooms are still in use and even as regards the operation of the 'open-door' system, Spencer (1960) found that only 14 psychiatric hospitals in England were 'open' and that of these 14 hospitals, 10 locked one or more wards as 'occasion required.' The first requirement, therefore, in dealing with 'acting out' under LSD is an acceptance of its naturalness by the psychiatric and nursing staffs. It is part of the therapeutic process which not only relieves the patient's feelings but also enables him to test the therapist's 'love' for him.

Secondly, once acting out is regarded as part of the therapeutic situation necessary for a small but definite number of patients, the physical conditions under which the treatment is given can be arranged accordingly. LSD

therapy involves specialized techniques demanding certain physical conditions. It is not a treatment which happens to be available. Unfortunately, 'acting out' does upset and frighten other patients under LSD, who do not find a need for this regressive behavior. The ideal LSD unit should be divided into two communicating but sound-insulated parts; a larger section for patients who do not need to do any 'acting out' and a smaller section (about one quarter of the size of the larger section) for those patients who do. This is a much more satisfactory arrangement than that adopted in some clinics where patients are transferred to a "breaking up room" when they start acting out.

Thirdly, it should be emphasized that the size of the problem of 'acting out' should not be exaggerated. The proportion of patients affected is less than 3 out of 10, but because of their poor ego structure, they require longer courses of treatment than those who have no need to express themselves in this way. Usually the pattern of a patient's reaction under LSD is apparent by the end of the fourth week of treatment ad patients who are going to need 'acting out' will have given evidence of their need by that time. The staff of LSD units where, for any reason 'acting out' cannot be coped with, would be well advised to take patients on for a definite four weeks preliminary treatment first and at the end of that time exclude those to whom 'acting out' will obviously be an essential part of their treatment.

The Uncertainty of the Reaction

Generally it may be said that therapists have been content to use amounts of LSD which are too small to ensure a regular reaction and a steady flow of unconscious material. If doses of not more than 200 μg. are used, it seems inevitable that, particularly if the patient is receiving treatment at twice weekly intervals, there will be days when, for no apparent reason, the patient will get no reaction or what he describes as a 'dead day.' In this connection it is essential that the drug be taken on an empty stomach. The author's rule is 'no breakfast' for patients (the majority) who start their treatment at 9 a.m. and 'no food for 5 hours before' for patients (the decreasing few) who start at 2 p.m.

Patients Who Are Resistant to LSD

There is undoubtedly a small number of patients who for some biochemical reason are completely resistant to LSD. The author has had three patients who have produced no symptoms of any kind on doses of 1,500 μg. Individual patients' responses to the drug appear to form a continuum for a more than adequate response at 25 μg to a nil response at 1,500 μg beyond which it is not worthwhile increasing the dose. If the initial dose in a course of treatment is 25 μg and the dose is doubled at each treatment until a satisfactory response is achieved, 1,600 μg is reached at the 7th treatment. If the patient shows no reaction at 1,600 μg the dose is reduced to 500 μg and additional drugs like ritalin (methylphenidate) and insulin are used as described in the next section. Some patients are resistant to a combination of LSD,

intravenous ritalin, and insulin and for these some other form of therapy must be tried.

Producing the 'Break-through' of Unconscious Material

Occasionally patients who only reach the stage of non-specific fears improve considerably on LSD therapy, but generally speaking, the more unconscious material of a personal kind the patient can produce, the better is the outcome of the treatment. Patients who produce much in the way of atavistic symbols such as monsters, snakes, etc., usually have insufficient ego-formation to be able to cope with the contents of the unconscious and their response to treatment is generally poor.

It is rare to find that a single re-experience of a repressed memory is sufficient to enable the patient to deal with the remembered experience and for it to become emotionally dead. One patient receiving treatment at weekly intervals relived a repressed beating he had received as a boy from his mother on fourteen consecutive treatment days before it died away and troubled him no more. This indicates what a lengthy treatment LSD can frequently be and some therapists have given up using the treatment because their early cases have not responded quickly enough.

Although LSD seems to be the most efficient drug available for bringing unconscious material into consciousness, it is by no means entirely satisfactory for this purpose. Some patients feel that there is a 'something beyond' which LSD does not enable them to experience, others get 'stuck' at certain levels of experience, which they continually repeat, while others as mentioned above, produce little or no unconscious material. For such patients auxillary measures are available which frequently allow a 'break through' to the unconscious.

Intravenous Methylphenidate (Ritalin)

In 1959 the author, following his experience with intravenous methylamphetamine (methedrine) as an abreactive drug, decided to give it to patients already under the influence of LSD but in whom the LSD had produced little or no unconscious material. The methylamphetamine was given intravenously about 1½ hours after the LSD, but it gave rise to such severe headache, nausea and hypertension followed by reactive hypotension that its use was discontinued. Intravenous methylphenidate was then used as its effect on the cardiovascular system and especially on the blood pressure was insignificant compared with those of methylamphetamine. Doses range from 20–60 mgm. intravenously about 1½ hours after the LSD has been taken. The methylphenidate often promotes the emergence of unconscious material within a matter of seconds or minutes, and patients frequently comment on the enhanced qualitive nature of the experience under methylphenidate compared with what they experience under LSD alone. Not infrequently, it causes an increase in the fear experienced by the patient and yet at the same time it paradoxically makes the fear more bearable. About 50 per cent

of the author's patients now receive intravenous methylphenidate as part of their treatment.

Insulin Hypoglycaemia

Sandison, Spencer and Whitelaw (1954) drew attention to the similarity between the content of the LSD experience and that of the hypoglycaemic states found during recovery from deep insulin coma. In 1961, the present author gave 25 μg of LSD to a patient who had been without food for 4 days. The LSD produced a most profound reaction, far more profound than would normally have been expected from such a dose. For social reasons the patient was admitted to the hospital where his more than ample appetite was noted by other patients. A second LSD treatment, dose 50 μg, was given 7 days after the first, but despite the drug being given on an empty stomach the patient showed no reaction at all. The dose had to be increased to 200 μg before the drug began to have any effect. It was felt, therefore, that the patient had probably become hypoglycaemic during the 4 days he had spent without food prior to his first dose of LSD and it was decided to try the effect of insulin in some patients who were proving resistant to LSD and methylphenidate. The insulin is given one hour before the LSD and in increasing doses short of those required to produce 'sopor.' In practice the dose varies between 10 units and 140 units, intravenous methylphenidate is given 1½–2 hours after the LSD and this triple combination of drugs often enables a 'break through' to the unconscious to be achieved. It is particularly valuable in cases of obsessional neurosis and occasional cases where sexual feelings are so deeply repressed that they are only minimally integrated if at all into the ego.

Termination of Each Day's Treatment

The chief difficulty at the end of the day's treatment is that of cutting short the action of LSD to which there is no known antagonist. It helps if patients are accepted only for a full day's treatment with the LSD being given at 9 a.m. The author no longer gives half-day treatments as experience has shown that in order to achieve a continuing break-through of unconscious material, it is necessary to give LSD in sufficiently large doses that the patient is rarely ready to go home until 8–9 hours after the ingestion of the LSD.

At present no certain method of cutting short the LSD reaction is known. In whatever way the LSD reaction is produced it seems unlikely that the LSD itself is responsible for it as the drug is completely eliminated from the body in from 1–2 hours after ingestion (Cerletti and Rothlin, 1955) whereas the LSD reaction may last 9–12 hours or even longer. It is inferred, therefore, that the LSD reaction is probably due to breakdown metabolites of the LSD rather than to the LSD itself (Rinkel 1957).

As the absence of any adequate means of cutting short the LSD reaction is one of the major difficulties of the treatment, it is considered worthwhile to summarize the literature on this part of the subject fairly completely. Most

of the work summarized was undertaken, not in an attempt to find an antidote which would cut the LSD reaction short, but to discover whether the drugs used were likely to be of benefit in the treatment of schizophrenia. At the time it was thought that LSD produced a 'model' schizophrenic toxic psychosis and that drugs which could inhibit the development of this psychosis might be of value in the treatment of schizophrenia itself.

The substances selected appear to have been chosen according to one or another of the various theories which have been put forward to explain the action of LSD and which have been summarized by Isbell, Logan and Miner (1959). The theories fall into three groups as follows:

1. There is inhibition at the dendritic synapses of the brain because of competition with one or other of the neurohumoral substances or on the contrary to accentuation of the activity of the neurohumoral substances by the LSD. Usually, LSD is a serotonin antagonist. It has such an action on isolated smooth muscle preparations, unless it is in low concentration when serotonin contractions are increased.

2. There may be derangement of the central adrenergic or cholinergic mechanisms.

3. There may be derangement in the breakdown metabolism of adrenaline, the LSD inhibiting an enzyne responsible for the conversion of adrenochrome into dehydroxyindoles. (Hodder et al. 1959).

Unfortunately, it is not possible to classify biochemically, the various substances detailed below which have been used in an attempt to find an antidote to LSD under the above theories as the action of many of the substances are not fully understood. They are given as a guide to workers with LSD since an antidote to LSD is unlikely to be found unless the problem of finding such an antidote can be approached from a completely new angle.

Serotonin and its precursor *hydroxtryoptophane* have no effect either in preventing the LSD reaction from occurring or in neutralizing it once it has commenced.

A number of the substances which have been used to prevent the LSD reaction from occurring are closely related clinically to LSD and their effect may be due as much to cross tolerance with LSD as to any blocking effect they may have. Abramson et al. (1959) found that *l-methyl-d-lysergic acid diethylamide (MDL–41)* prevented the LSD reaction from appearing if the drug was given for five days before the LSD. Turner et al. (1959), and Clark and Bliss (1957) following Ginzel and Mayer Gross (1956) found the same was true of *2-brom-lysergic acid diethylamide (BOL-148)*, but neither drug had any effect if given after the LSD. The effect of the intramuscular injection of 0.5 gm of *mono-ethylamide of lysergic acid* was studied in 13 schizophrenic patients by Callieri and Ravetta (1957). The effect of the subsequent LSD was sometimes enhanced and sometimes diminished, but the experiment does not appear to have been adequately controlled.

Isbell et al. (1959) found that a pre-treatment serotonin antagonist, *1-benzyl-2-methyl-5-methoxytryptamine (BAS)* and also *scopolamine* did not attenuate or accentuate the action of LSD in man. The authors conclude that their work neither supports nor disproves hypotheses attributing the LSD

reaction to increased inhibition or facilitation at the site of the central synopsis.

Fabing (1955a) found that a number of patients and experimental subjects failed to develop an LSD reaction after having been given *azocyclonal* in doses of 50 mgm. The author (1955b) found that 10 mgm of azocyclonal cut short reaction induced daily for seven days but Isbell and Logan (1957) could not confirm this nor could other workers and azocyclonal is now regarded as having no anti-LSD action.

Phenoxybenzamine (dibenzylene) was used by Bertino et al. (1960) as a sympathetic blocking agent in normal human subjects who were then given LSD. The phenoxybenzamine did not block any of the effects of the LSD except mydriasis and other sympathetic signs, but it did appear to diminish the subjective amxiety associated with the LSD. This work confirms the findings of Isbell et al. (1959) and is confirmed by the later work of Muphree (1962). Glon (1959) used *benzactyzene* as a parasympatholytic drug and found that 20 mgm/kg gave measurable protection against LSD-25 hypothermia, but that it reduced the intensity of the LSD reaction rather than altered the fundamental time relation in respect to onset, duration and recovery.

Atropine was used by Clark and Bliss (1957) as a possible blocking agent against the symptoms of the LSD reaction due to parasympathetic discharge but was found to be ineffective.

Agnew and Hoffer (1955) gave 200 mgm. of *nicotinic acid* to 5 subjects at the height of the LSD reaction and found that it had marked normalizing effect. The administration of nicotinic acid for some days prior to the LSD had little effect except to produce a nicotinic acid-induced toxic state. The authors undertook this work following the partly supported assumption by Mayer Gross et al. (1953) that LSD interferes with carbohydrate intermediate metabolism. The results appear to be somewhat equivical. No controls were used and the same symptoms appear to be influenced to very varying degrees in different subjects. Certainly no overall reduction of the LSD reaction, let alone its abolition seems to have been obtained.

Abramson and Skarofsky (1960) found that between 40–260 mgm. of *prednisone* either reduced or eliminated anxiety in 4 out of 5 subjects given 25–50 μg of LSD without changing the usual LSD symptomatology as measured by a standardized questionnaire.

Friedhoff and Abrams (1960) found that i.v. injections of *L-glutamine* or *L-glutamic acid* followed by i.v. LSD five minutes later inhibited elevation of rectal temperature in rabbits, particularly in the case of L-glutamine.

Fabing (1955b) also used the *gamma isomer of pipradol (meretran)* as a blocking agent against LSD reaction. It was effective if given for seven days before the LSD but there is no indication of its effect when given at the height of LSD reaction.

Clark and Bliss (1957) found that *chlorpromazine* in a dose of 50 mgm. did not antagonize the stimulating effect of LSD-25. The time when the chlorpromazine was given in relation to the LSD is not stated.

Murphree (1962) found that 25 mgm. chlorpromazine blocked the recogni-

tion of 15 μg of LSD if given 30 minutes before the LSD but facilitated the recognition if it were given at the same time as the LSD or 30 minutes afterwards. It blocked the papillary dilation associated with LSD when given at all these times. These findings are in agreement with Isbell and Logan (1957).

Sogliani and Sagripanti (1957) found that contrary to other worker's results, the action of LSD was not neutralized by subsequent administration of *chlorpromazine* but enhanced.

Clark and Bliss (1957) found that doses of *amylobarbitone* did not antagonize the stimulating effects of LSD-25. The time when the amylobarbitone was given in relation to the LSD is not stated.

Apter (1958) found that LSD in solution effectively and safely overcame cortical and respiratory inhibition in cats induced by lethal doses of *pentobarbitone*. It was more effective than picrotoxin in this respect.

Dobkins and Harland (1959) were unable to conclude on statistical grounds that LSD had adequate analeptic effects as far as *thiopentone* was concerned.

Hoffer and Callbeck (1960) state that LSD elevates plasma adrenochrome as it inhibits an enzyme responsible for the conversion of adrenochrome into dehydroxyindoles. The sulphydril compound penicillamine can, in vitro, convert adrenochrome predominantly into 5, 6-dehydroxy-N-methyl indole which is not psychotomimetic. It would appear therefore that if penicillamine were given with LSD the LSD reaction would be reduced because the adrenochrome level would not rise as it usually does. A subject was therefore given 2 Gm of *penicillamine* over 2 days followed by 100 mgm. LSD. As a result the subject was (1) unable to relate adequately to others (2) unable to use affect-laden words (3) unable to respond to the emotional tempo of a group situation (4) completely without drive. Five months later the subject had not fully recovered from this condition which was similar to that of another subject who had taken adrenolatin. The authors postulate that penicillamine and LSD together 'deplete the sympathomimetic amine content of the peripheral and central stores, thus producing the disorder of affect as well as that of antonomic reversal.'

Practical Applications of Above Research Work

The author has given the following drugs without success in an attempt to cut short the LSD reaction: benactazine hydrochloride, ascorbic acid, nicotinic acid, nicotinamide, azocyclone, prednisoline, succinic acid, glutamic acid and hydroxyzine.

In practice, only drugs belonging to the phenothiazine and baribturate acid groups are found to be effective in reducing the effects of LSD. Normally towards the end of treatment a patient is given either chlorpromazine (100 mgms.) orally, and/or pentobarbitone (200 mgms.) also orally. The chlorpromazine has the disadvantage of being uncertain in its action and this is true even if it is given intramuscularly, while pentobarbitone, because it is a quick acting barbiturate will not infrequently cause such an increase in tension that the patient may be forced to seek an outlet in some kind of

impulsive behavior. Many patients find that soon after ingestion, pentobarbitone produces still more unconscious material, i.e. it facilitates the abreactive action of the LSD, but that it has a generally calming effect.

Sometimes a more slowly acting barbiturate than pentobarbitone is found to be suitable. Sodium amylobarbitone, 200 mgm.–400 mgm. suits many patients especially if it is combined with 100 mgm. of chlorpromazine.

Intramuscular phenobarbitone (200 mgm.) is worth trying if oral sodium amylobarbitone has proved unsatisfactory. Sodium amylobarbitone intravenously in doses short of those required to produce anaesthesia induces a pleasant trance-like state which may last long enought for the LSD experience to die away.

Chlorpromazine (100 mgm.–200 mgm.) intravenously is much more effective than the same dose intramuscularly and can generally be relied upon to counteract the LSD effectively. In emergencies, however, and at times when it is essential to cut short the LSD intramuscular sodium amylobarbitone (200 mgm.) and intravenous chlorpromazine (100 mgm–200 mgm.) appear to be the drugs of choice.

From this it will be seen that there is no one drug which is the most suitable for stopping LSD reaction in all cases. Only by trial and error can the most useful drug or combination of drugs be found for a particular patient.

Many patients complain that they cannot sleep during the night following the LSD treatment and that the LSD experiences recur during the days in between their treatments. For these patients sodium amylobarbitone (200 mgm.) and/or chlorpromazine (100 mgm.) at night usually enable the patient to sleep without excessive dreaming and sodium amylobarbitone (50 mgm.) four times daily is sufficient to keep the LSD experiences in abeyance in the intervals between treatments.

Controlled Studies of the Effectiveness of LSD Treatment

Abramson et al. (1955) found a marked placebo response in subjects who were expecting to be given LSD and who received tap water as placebo instead. The subjects knew the nature of the LSD reaction although they had never actually been given the drug. The placebo reaction included moist palms, headaches, fatigue, drowsiness, anxiety, dream-like feelings, unsteadiness, etc. but no subject experienced hallucinations or the recovery of repressed childhood memories. In view of the nature of the placebo-response and the almost universal occurence of hallucinations among patients given LSD, it is difficult to see how a statistically controlled double blind trial can be set up since as the trial proceeded, the therapist in charge of the patient would be likely to know whether the patient was being given LSD or placebo. It would probably also be difficult for patients to be maintained on a placebo for a sufficiently long time for trial purposes as they would fairly quickly appreciate that they were not recovering repressed childhood memories in the way the patients on LSD were doing. If these difficulties can be overcome, there seems to be no reason why the drug should not be subject to

a double blind control trial. Occasionally the author has given tap water in place of the patient's usual dose of LSD but invariably the patient has complained of the lack of effect of the LSD on these days.

Robinson et al.(1963) have adopted a different approach to this question. They have considered one factor—the abreaction produced by LSD and compared the results of the treatment in cases in which LSD abreaction occurs with the results obtained by 'standard' psychotherapy and abreaction produced by a mixture of cyclonal and methedrine. The authors conclude that "abreaction was not an essential factor in the recovery of the patient. There were indications that LSD may be a useful therapeutic agent in anxious patients as opposed to passive and in those with a diagnosis of free floating anxiety."

If confirmed, these results are, of course, of the greatest importance if only becaue abreaction has been used from time immemorial for the relief of neurotic conflicts. A few queries may be raised regarding the paper, as from the details given, it is difficult to visualize the circumstances under which the LSD was given. In particular it would be helpful to know how many of the patients on LSD were given treatment at the same time, as the authors do not give the distribution throughout the week of 33 patients who were given LSD. They do not say whether the rooms in which the patients were treated were grouped together or scattered throughout the Hospital. It would also be desirable to know how much time the therapists were able to spend with the LSD patients on the actual day of treatment. This is particularly important because of the tight schedule of work which the therapists describe for themselves in the paper. From the details given in the paper it can be calculated that each therapist devoted 46 hours a week at the beginning of the trial reducing to 37 at the end of the trial to patients receiving standard and cyclonal/methedrine treatments and individual therapeutic sessions. This excludes the time spent on LSD patients on day of treatment, weekly meetings and all other medical duties of the therapists at the Hospital. In the absence, therefore, of further information it would seem unlikely that the therapists would be able to spend much time with the patients while the latter were actually under the influence of LSD. Precise information on these points is required, because if the patients are left alone for any length of time while under LSD, this can, as mentioned earlier in this paper, be itself a traumatic experience. A push-bell for the patients use is helpful but no adequate substitute for the personal presence of the doctor/nurse therapists. More information about the role of the nurse would be helpful, particularly in view of the doses of LSD used. Starting with 50 μg and increasing weekly by 25 μg gives a dose of 225 μg for the final week. Doses of this order are high for many patients and the present author finds it difficult to believe that 75 mgm. of chlorpromazine orally repeated one hour later would effect an adequate cut-off of the LSD reaction in the majority of patients on these doses. It would seem likely that such patients would be a good deal more disturbed emotionally on returning to

their ward from the treatment unit than would patients who had just completed a session of 'standard' psychotherapy. Robinson and his co-authors mention that only those patients receiving LSD recovered any repressed memories of childhood and information as to how these re-experienced incidents were dealt with at the time of re-experience would be helpful particularly as the authors state that no suggestions were offered to the patients while they were under the influence of LSD. This is contrary to the present author's practice and in fact represents a form of LSD therapy which he has abandoned because of the poor results obtained with it. He regards actual, positive, repeated suggestions as an essential part of the reconditioning, relearning process under LSD. Conditions under which different therapists use LSD vary so much that the circumstances under which it is used in any comparative trial need to be described in the greatest detail.

Summary

This paper gives an account of the author's technique in giving treatment with LSD. The use of methylphenidate and insulin hypoglycaemia to potentiate the abreactive properties of LSD are described. The roles of the members of the therapeutic team concerned in LSD treatment are considered as are the difficulties found in terminating the LSD reaction. Finally, consideration is given to some of the problems posed by a recent controlled study of the value of LSD reaction.

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