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# CONDITIONED AVERSION APPLIED TO THE TREATMENT OF HOMOSEXUALITY AND COMPULSIVE RUMINATIONS

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## DECLARATION

I hereby declare that this thesis is entirely my own work and that it has not been submitted to any other university.



## SUMMARY

The aim of this research project was to test the efficacy of aversion therapy in the treatment of homosexuality and compulsive ruminations respectively. A review of the literature indicated that the most suitable paradigm for aversion therapy was response contingent aversive stimulation, used with high intensity shock and one hundred per cent reinforcement. 'Holistic' aversion therapy, i.e. therapy directed at behavioural, cognitive and motivational components of homosexuality, was distinguished from 'monistic' aversion therapy, i.e. therapy directed mainly at behavioural components. It was submitted that therapy based on the holistic model was more effective than therapy based on the monistic model. Subjects consisted of 80 homosexuals and 60 compulsive ruminators. Homosexuals were divided into a no-contact control group, a psychotherapy group, a monistic aversion therapy group and an holistic therapy group. Subjects in the three experimental groups were encouraged to make heterosexual contact, to avoid homosexual contact, to use heterosexual masturbation fantasies and were counselled as regards the elimination of heterosexual fears. In addition, subjects in the monistic group were treated by monistic aversion therapy and clients on the holistic group were given aversion therapy based on the holistic model. Compulsives were divided into a minimal-contact control group, a psychotherapy group and an aversion therapy group. Subjects on the two experimental groups were treated by thought-stopping, logotherapy and relaxation. Subjects in the aversion therapy group were in addition given aversion therapy. The results showed that holistic aversion therapy was significantly more effective, in eliminating homosexual behaviour than no-treatment, psychotherapy and monistic aversion therapy. Monistic aversion therapy was not significantly more effective than psychotherapy. It was concluded that holistic

aversion therapy was a most effective method of eliminating homosexual behaviour, but that the use of monistic aversion therapy could not be justified. The results were also taken to show that the treatment of underlying drive was required in the treatment of homosexuality. It was suggested that aversion therapy be used only as part of a total treatment program, since the suppression of homosexual responsiveness did not lead to a concomitant increase in heterosexual responsiveness. Aversion therapy, on its own, was found to be an insufficient treatment and various other methods were suggested for the establishment of heterosexual responses.

In regard to the treatment of compulsive ruminations, it was found that although both psychotherapy and aversion therapy were both effective in eliminating compulsive ruminations, aversion therapy was not significantly more effective than psychotherapy.

Outcome of treatment, for both homosexuals and compulsives, did not relate to such variables as age, neuroticism, extroversion, conditionability, prior exposure to treatment and durution of the homosexual or compulsive behaviour. No relationship was found between outcome and the primary/secondary classification of homosexuals. But pre-treatment Kinsey ratings of homosexuality related significantly to outcome of treatment.

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I would also like to thank Professor L A. Hurst for his assistance in arranging the referral of suitable subjects for treatment in the research project.

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# INTRODUCTION

The introduction will be divided into a number of sections. A brief review of the development of aversion therapy (AT) will be followed by sections dealing with theoretical and experimental topics, namely; the unconditioned stimulus (UCS), the conditioned stimulus (CS), the relationship between CS and UCS, interval between conditioning trials and between treatment sessions, aversion conditioning paradigms, the role of motivation in AT, the effects of AT and an 'holistic' approach to AT. The above will be followed by a brief discussion of some of the problems inherent in outcome research. The penultimate sections of the introduction will consist of brief reviews of the treatment of homosexuality and obsessive-compulsive ruminations (OCR's) respectively. Finally, the introduction ends with a statement of the aims of the study.

## Aspects of the development of aversion therapy

Rachman and Teasdale (1969a) defined AT as:

> an attempt to associate an undesirable behaviour pattern with unpleasant stimulation or to make the unpleasant stimulation a consequence of the undesirable behaviour. In either case it is hoped that an acquired connection between the behaviour and the unpleasantness will develop. There is a further hope that the development of such a connection will be followed by the cessation of the target behaviour.

Two broad stages in the development of AT can be delineated. The first, mainly in the 1940's, was distinguished primarily by the use of emetics as the UCS and the application of AT to the treatment of alcoholism. The second, from about the early 1960's until the present, has been largely characterized by the use of electric shock as the UCS and the application of AT to the treatment of sexual disorders.

A very considerable amount of work on the treatment of alcoholism, by chemically based AT, was carried out (see Franks, 1960; Miller, Dvorak and Turner, 1964). Particularly prominent were the studies carried out by Voegtlin and his associates (Lemere and Voegtlin, 1950; Lemere, Voegtlin, Broz, O'Halleren and Tupper, 1942).

Although the need for strict adherence to Pavlovian conditioning procedures, in the application of AT to the treatment of alcoholism, was stressed (Diethelm, 1955; Voegtlin and Lemere, 1942), much of the chemical AT of alcoholism, with the exception of the studies of Voegtlin and his associates, was of poor quality and did not conform to Pavlovian principles (Franks, 1960). Thus although some researchers claimed to have based their procedures on that of Voegtlin, the methods used contained variations 'so serious' and counter to the laws of learning theory that 'positive results would have been astonishing' (Eysenck and Rachman, 1965).

Some workers claimed success in treating alcoholism by chemical AT (Ash and Mahoney, 1951; Lemere and Voegtlin, 1950; Thimann, 1949), but the results obtained were generally equivocal and hich post-treatment relapse rates were encountered (Eysenck and Rachman, 1965; Franks, 1960, 1963; Rachman and Teasdale, 1969a). Thus in spite of the large body of work, the efficacy of chemical AT as a treatment of alcoholism has been left undecided (Franks, 1960; Rachman and Teasdale, 1969b).

The resurgence of interest in AT in the late 1950's may have been due to the emergence of behaviour therapy, and the publication of a paper by Raymond (1956) on the treatment of fetishism by chemical AT. The procedure used by Raymond was used as a model in other studies (Clark, 1963; Cooper, 1963). However these reports, like the report of Raymond, were single case studies from which 'conclusions are notoriously difficult to be drawn' (Feldman, 1966). Further, the AT technique used by Raymond has

been criticized as characterized more by 'punitiveness than by any requirement of learning theory' (Lublin, 1969).

In 1960 an important contribution was made by Freund in his paper on the treatment of homosexuality by AT (Freund, 1960). The study was important insofar as Freund used a large sample of subjects, had long follow-ups and took account of motivational factors. The treatment procedure employed an emetic as the UCS. When the emetic mixtures became effective slides of dressed and undressed males were shown to the clients. Freund concluded that AT offered no advantages as regards 'the quality or degree of therapeutic success' as compared to other psycho-therapies for treatment of homosexuality. Freund also found that clients tended to relapse after 'successful' treatment.

Thorpe, Schmidt, Brown and Castell (1964) developed the technique of 'aversion relief' in an attempt to contemporaneously condition an approach response to heterosexual stimuli as well as aversion to homosexual stimuli. Aversion relief has been used in a number of studies (e.g. Gaupp, Stern and Ratliff, 1971; Larson, 1970; Solyom and Miller, 1965) but the efficacy of aversion relief has not been demonstrated (Barlow, 1973).

In an influential paper Feldman (1966) extensively reviewed the literature on AT as applied to sexual disorders and concluded that 'it cannot yet be said that there is an overwhelming case for the efficacy of any single aversion technique in the treatment of any single deviation'.

The present status of AT remains as described by Rachman and Teasdale (1969a):

> Our evaluation of the available evidence is that aversion therapy is probably effective, but we have been unable to satisfy ourselves beyond all doubt. The evidence is scanty and rarely meets the strict standards which must be applied in assessing therapeutic effects with most types of disorders.

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Rachman and Teasdale (1969b) in another review wrote:

> The surprising thing about aversion therapy is not that its effects are uncertain, but rather that it works at all. The connections among aversion therapy and psychological theory and verified experimental data are tenuous.

The following sections will deal with theoretical aspects of AT.

## The unconditioned stimulus

This section will consist mainly of a review of various kinds of UCS used in AT and of the requirements to be met by UCS in AT.

Chemical emetics and electric shock have been most frequently used as the UCS in AT. It is curious that electric shock was, until fairly recently largely ignored, since the use of electric shock in AT was described in two early reports in the literature (Kantorovich, 1935; Max, 1935). It is all the more curious in view of the patent advantages of electric shock over chemically produced nausea and vomiting (Azrin and Holz, 1966; Rachman, 1965; Rachman and Teasdale, 1969a, 1969b).

The use of chemical emetics as the UCS has a number of severe disadvantages. Firstly, it is extremely difficult to obtain the correct critical time sequence between CS-UCS, since the exact prediction of time onset of nausea or vomiting, after ingestion of the emetic, is impossible (Franks, 1960). Furthermore, individual differences in reactivity to emetic drugs cannot be calculated. In view of the importance of the CS-UCS interval for successful conditioning (Kimble, 1961), lack of exact control over CS-UCS interval is a major disadvantage.

Secondly, chemical aversion is arduous and unpleasant. This precludes frequent pairings between CS and UCS. Since the strength of conditioning increases as a function of the number of reinforcements (Hull, 1943; Razran, 1949; Skinner, 1938), infrequent pairings are another disadvantage.

Thirdly, emetics have undesirable side effects. Most are cortical depressants and therefore probably inhibit the formation of conditioned responses (Rachman, 1965; Trouton and Eysenck, 1961). Psychological side effects are that emetics tend to cause hostility in the client, which may interfere with the treatment program (Rachman, 1965).

Fourthly, emetics do not allow for simple and exact variation in the strength of the aversive stimulus. Easy variation in intensity of UCS, is important in view of evidence indicating that individual pain threshholds differ (Becker and Matteson, 1961; (Lynn and Eysenck, 1961).

Electrical shock as the UCS does not suffer from the same disadvantages as emetics. Unlike emetics the onset, termination and intensity of electric shock can be precisely controlled and shock allows for frequent pairings of CS-UCS.

As regards electric shock, the following requirements should be met. Brief or moderate electrical stimulation should be avoided since the greater the intensity of the UCS the greater the amount of response suppression (Appel, 1963; Azrin, 1960; Azrin and Holz, 1966; Azrin, Holz and Hake, 1963; Boe and Church, 1968; Hake and Azrin, 1965; Logon, 1969; Solomon, 1964; Tanner, 1973). However, care should be taken not to make the UCS intolerable, as too high UCS intensity may adversely affect aversion conditioning (Kimble, 1961). If a mild UCS is used a response may not be weakened and the UCS may even serve as an additional stimulus for the response and thereby facilitate it (Church, 1963). Further, a mild UCS may allow for recovery from the effects of aversion conditioning (Azrin, 1960; Azrin and Holz, 1966; Hake and Azrin, 1965). Animals given a brief and/or moderate shock have developed a resistance to the shock (Azrin, 1960; Miller, 1960).

Further, shock should not be gradually increased in intensity to maximum strength, but rather administered immediately at

maximum strength (Azrin, Holz and Hake, 1963; Miller, 1960). Also, the sudden increase in prevailing UCS intensity accentuates degree of response suppression (Azrin, 1960). But there is indirect experimental evidence that variation in the intensity of the shock increases resistance to extinction (McClelland and McGown, 1953). The intensity of shock should thus be randomly varied, but kept at high levels.

Variation in intensity of UCS may be a factor in preventing adaptation to UCS. Repeated exposure to shock, in human subjects, has been reported to lead to decreased reaction to shock as ndicated by psychological measures and subjective reports of painfulness (MacDonald, 1946; Schneider and Baker, 1958; Seward and Seward, 1934). Further, using animal subjects it has been shown that response to shock diminishes with successive sessions unless amplitude of UCS is increased (Overmeier and Seligman, 1967). It thus appears advisable not to continue each conditioning session 'too long', in order to prevent adaptation.

It has been demonstrated that response suppression is a positive function of the duration of the UCS (Boroczi, Storms and Broen, 1964; Church Raymond and Beauchamp, 1967). The effects of increasing the duration of the UCS are possibly similar to increasing UCS intensity, as both procedures led to increased suppression of bar-pressing in rats (Church, Raymond and Beauchamp, 1967).

Gold and Neufeld (1965) rejected both electrical and chemical stimulation as both ethically and aesthetically, unacceptable. UCS's other than shock or emetics have been used. An extremely severe UCS used, was chemically induced paralysis of the respiratory system, producing total cessation of breathing for 60 to 90 secs and a state of extreme terror in the client (Sanderson, Campbell and Laverty, 1964). But subsequent research has cast serious doubt on the effectiveness and value of respiratory inhibition (Farrar, Powell, and Martin, 1968; Holzinger, Mortimer and Van

Dusen, 1967; Madill, Campbell, Laverty, Sanderson and Vanderwater, 1966).

A feature of respiratory paralysis as well as other AT methods used is the traumatic element. When traumatic conditioning occurs a response may totally disappear (Solomon and Wynne, 1954). Examples of total suppression of behaviour after traumatic conditioning are the experiments of Masserman (1943) and Klee (1944).

Other workers have employed aversive mental images as an UCS (Cautela, 1967; Cautela and Wisocki, 1969). Cautela and Wisocki (1969) described the use of aversive imagery in treating a case of homosexuality as:

> an aversion conditioning method in which the client, in imagination, pairs the pleasurable object (a sexually attractive male) within a noxious setting (e.g. a cesspool or dungeon) with the image of vomiting all over himself, the homosexual contact, and every aspect of the situation.

Cautela (1967) claimed great success in using aversive images to establish avoidance responses. Other researchers have applied the method to treat conditions such as alcoholism (Anant, 1967), compulsive eating (Stuart, 1967), sexual compulsions (Davison, 1968) and smoking (Sacks, Bean and Morrow, 1970).

In spite of the reported efficacy of aversive imagery and the practical advantages the method has over both chemical and electrical aversion, e.g. its simplicity and non-painful nature, it suffers from two disadvantages. Firstly, not all persons have the ability to visualise clearly or with a strong sense of reality. Secondly, since the aversive images reside in the imagination, no objective quantitative measures of the UCS, its intensity or time of occurrence, can be made. Nor under the circumstances, can the UCS be controlled as regards intensity, onset and duration. Such difficulties make aversive images unsuitable as the UCS in a controlled study attempting to assess the efficacy of AT.

It has been suggested that electrical shock may give rise to

negativistic and aggressive behaviour on the part of the client (Rachman and Teasdale, 1969a; Ulrich, Hutchinson and Azrin, 1965). It has further been suggested that AT may arouse fear and anxiety in the client and will therefore be unpopular (Rachman, 1965). Rachman also submitted that high levels of anxiety may interfere with the development of the CR. But such a view is in conflict with findings that anxious subjects condition better than non-anxious subjects (Eysenck, 1957; Spence and Taylor, 1951). Highly anxious subjects also manifest greater stimulus generalisation than normal subjects (Mednick and Freedman, 1960). The view of Rachman also conflicts with evidence regarding the necessity of the UCS to create a strong emotional response in the subject (Kamin and Schaub, 1963; Lovibond, 1968). In fact, it has been demonstrated that the effect of relaxing a subject receiving shock is to reduce the aversive effects of the shock (Miller, 1926).

Finally, it is often difficult to isolate the UCS used in AT. Thus Cooper (1963) deprived a fetishist client of food and sleep for six days and nights during AT treatment. Not only was AT carried out every two hours, but after each treatment a tape recording was played to lecture the patient about his 'disgusting perversion'. The client was also not allowed to discard his female clothes, but instructed to look at his reflection in the mirror and re-enact every detail of his fetish. The technique, apart from being reminiscent of brainwashing, as described by Sargant (1959), is noteworthy for the multitude of possible aversive agents and the lack of an attempt to separate them.

The conditioned stimulus

Aspects of the CS to be discussed in this section are intensity of CS, CS constancy and kinds of CS available.

The strength of a conditioned response (CR) is influenced by the relative intensity of the CS in relation to competing stimulation of the background in which the CS occurs (Bragiel and

Perkins, 1954; Johnsgard, 1957). The stronger the intensity of the CS in relation to the other stimuli in the background, the stronger the amplitude of the CR. Therefore, during conditioning the intensity of background stimuli should be kept to a minimum in relation to the intensity of the CS. In addition, the greater the intensity of the CS the greater the amplitude of the CR (Barnes, 1956; Kesson, 1953).

Another relevant variable is that of CS constancy. The more exactly the CS is duplicated from trial to trial, the more rapid the conditioning (Voeks, 1954). But CS variability and the use of a wide range of CS's during conditioning lead to conditioning more resistant to extinction than conditioning established under conditions of CS constancy (Crum, Brown and Bitterman, 1951; Mackintosh, 1955; McClelland and McGown, 1953, McNamara and Wike, 1958).

Therefore, what seems to be required as regards the CS in AT is that the CS be intense in relation to the background stimuli, itself intense, that the CS be variable and a wide range of CS's used.

It has been argued that in the treatment of homosexuality by AT, the CS should be presented in hierarchical fashion (Feldman and MacCulloch, 1971). Feldman and MacCulloch partly based their argument on the work of Wolpe (1958). But Wolpe was treating phobias and conditioning an approach response to phobic stimuli, not conditioning an avoidance response to desirable stimuli. In addition, even in the treatment of phobias, it is not always necessary to present the CS in a hierarchical fashion (Jacobs, 1972; Stampfl and Levis, 1967).

As regards the kind of CS, possibilities include pictorial material, fantasy and real-life situations. Various writers have advocated, in the treatment of sexual disorders by AT, the use of sexual fantasy as the CS rather than static pictures. (McGuire and Vallance, 1964; McGuire, Carlisle and Young, 1965;

Mees, 1966). Erotic sexual fantasies may be more real-life and more effective than static visual stimuli in producing sexual arousal (Bancroft and Matthews, 1971; Bolles, 1967). Client produced images have been used in several studies (Jacobs, 1969, 1972; Kushner and Sandler, 1966; Mees, 1966; Thorpe, Schmidt, Brown and Castell, 1964). It has been submitted that the greater the similarity of the CS used in AT to the real life situation, the greater the transfer of learning from therapy to the real life situation (Goldstein, Heller and Sechrest, 1966).

An animal experiment, relevant to the discussion of the CS, was carried out by Lichtenstein (1950). One group of dogs was punished by shock as soon as they began eating, whereas a second group of dogs was shocked on presentation of food, but before they began eating. The first group showed an inhibition of eating, but the second group of dogs failed to show an eating inhibition following the conditioning. The experiment of Lichtenstein indicates a serious deficiency in those AT treatments of homosexuality where the CS's have consisted only of pictures of nude men. It is conceivable that an aversion may be conditioned to naked men but not to homosexual activities. It is suggested that visualizations or pictures of actual homosexual behaviour should be used as the CS in the treatment of homosexuality. A further study which has bearing on the CS is that of Quinn and Henbest (1967). Ten alcoholic clients treated by AT to the sight, smell and taste of whisky developed a persistent aversion to whisky. However, although the clients avoided whisky from four to eight years following treatment they continued drinking other kinds of alcohol. The results can be interpreted as indicating the need, in AT, for a wide variety of CS's and the suppression of drive motivating the undesirable behaviour.

Relationship between CS and UCS

To be discussed in this section are the CS-UCS interval and schedules of reinforcement.

Reviewers have been particularly critical of the disregard paid to correct CS-UCS sequences in AT (Franks, 196C, 1963; Rachman and Teasdale, 1969a, 1969b). Rachman and Teasdale (1969a) pointed out that:

> in any conditioning situation, the time intervals which elapse between presentation of the various stimuli and the response are of considerable importance, and some aversion therapists appear to have been ignorant of this fact or tended to ignore it.

For example, Spencer Patterson (1950) discussed the treatment of alcoholism by chemical AT and wrote that the alcohol (CS) should be administered to the client after onset of nausea (UCS). Spencer Patterson thus advocated backward conditioning, which also seems to have been used in the study of Freund (1960). Yet it is clear that backward conditioning, of all the conditioning paradigms, is least easily obtained and if obtainable, most easily extinguished (Fitzwater and Reisman, 1952; Kimble, 1961). Franks (1963) has pointed out that much of the AT attempted, has involved backward conditioning.

As regards the CS-UCS interval, the optimum period for establishing the CR is about 0.5 sec (Barnes, 1956; Fitzwater and Thrush, 1956). Conditioning has been shown to decrease with increasing CS-UCS interval (Church, 1963; Kamin, 1957). Magnitude of response repression in aversion conditioning has also been shown to decrease as CS-UCS interval is increased (Azrin, 1956; Camp, Raymond and Church, 1967; Church, 1969). The UCS must follow sufficiently closely after the response to be suppressed so that the punishment is perceived as a consequence of that response (Azrin and Holz, 1966; Church, 1969). Azrin and Holz (1966) concluded that the UCS should be delivered immediately after the response (CS). In addition, the application of an aversive UCS at the beginning of an approach response, has been shown to be more effective in suppressing that response than aversive stimulation once the response has been initiated or

completed (Aronfreed and Reber, 1965; Solomon, 1964). And it may be noted that CS-UCS intervals of up to a minute or more have been effective in producing response suppression (Bolles, 1967).

The work of Kamin (1957) was a particularly clear demonstration of the importance of CS-UCS temporal contiguity. But in later experiments Kamin (1965) found that when the UCS was administered without delay the response rapidly extinguished. If the UCS was delayed for long periods (up to 30 secs or more), then the CR tended to better resist extinction, although it would take longer to establish. Other work has also demonstrated that varied delay of punishment leads to greater resistance to extinction than immediate punishment (Crum, Brown and Bitterman, 1951). But the point is not clear as there is also evidence that immediate punishment leads to conditioning more resistant to extinction than delayed punishment (Church, 1969). It may be that shock administered in on irregular series is felt by the subjects to be more noxious than regular, anticipated shock (Lovibond, 1968). Lovibond described the aversive nature of uncertainty and demonstrated that aversive conditioning is enhanced if the subject is unable to predict onset of the noxious UCS.

Therefore, in view of the conflicting evidence, it seems advisable that in some conditioning trials the CS-UCS interval should be contiguous, whilst in others there should be a delay between presentation of CS and UCS, to ensure both rapidity of conditioning and resistance to extinction.

Finally, termination of the UCS before response suppression may cause subject to develop a resistance to the UCS (Azrin, 1960; Miller, 1960). Therefore as regards offset of UCS it is suggested that the UCS is applied until the response to be suppressed, is in fact suppressed.

As regards reinforcement schedules, partial reinforcement (particularly of a variable kind) leads to conditioning more resistant to extinction than conditioning obtained using one

hundred percent reinforcement (Ferster and Skinner, 1957; Lewis, 1960) and should therefore be used in AT. Yet, partial reinforcement has most often not been used in AT (Feldman, 1966; Kanfer and Phillips, 1970).

However there appears to be an important exception to the use of partial reinforcement. When the conditioning is based on response contingent aversive stimulation (RCAS)[1] response suppression is delayed by partial reinforcement (Azrin, Holz and Hake, 1963; Logan, 1969). Azrin and Holz (1966) in fact advocated one hundred per cent reinforcement with RCAS. When RCAS is used with very high UCS intensities, continuous reinforcement appears to produce complete suppression of responses, with no subsequent recovery (Azrin, 1960; Azrin and Holz, 1966). But when the RCAS is used with lower levels of UCS intensity, continuous reinforcement appears to make for more rapid recovery of responses than partial reinforcement (Azrin and Holz, 1966; Lovibond, 1963). Finally, it has been claimed that RCAS used with continuous reinforcement was less effective than intermittent reinforcement in suppressing a motor response (Lebow, Gelfand and Dobson, 1970) But the study was inconclusive and not necessarily applicable to the suppression of an appetitively motivated approach response.

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1. The term RCAS is used, in this work, to delineate a specific AT procedure where the aversive UCS is contingent upon performance of the response to be suppressed (Azrin and Holz, 1966; Lovibond, 1970). RCAS is distinguished from operant avoidance conditioning in that in RCAS the subject is only shocked if he makes the undesirable response, whereas in avoidance conditioning the subject is shocked if he does not make an avoidance response to the undesirable behaviour. RCAS is also distinguished from classical conditioning in that in RCAS shock is dependent on subject's behaviour and only follows if subject makes a response, whereas in classical conditioning the shock is paired with the CS regardless of the subject's behaviour.

Interval between conditioning trials and between treatment sessions

The time interval between conditioning trials is relevant. It has already been mentioned that the strength of conditioning is a function of frequency of UCS-CS pairings. But the work of Pavlov (1927) on inhibition of reinforcement and of Hull (1943) on inhibitory potential sugrests that there should be some time interval between conditioning trials. It has been shown that as the time interval between CS-UCS trials is increased, conditioning becomes more rapid (Spence and Norris, 1950). Feldman and MacCulloch (1971) claimed that variation of time interval between conditioning trials increased resistance to extinction but offered no experimental basis for their view.

Sufficient time between each conditioning session should also be allowed in order to avoid adaptation to UCS (Overmeier and Seligman, 1967). Thus Overmeier and Seligman found that dogs failed to jump a hurdle in response to shock if they had been exposed to shock the day before. But if exposure to shock had taken place 2, 3 or 6 days earlier, hurdle jumping did occur in response to shock.

Aversion conditioning paradigms

Avoidance conditioning and RCAS will be discussed in detail in this section. Both methods have been widely used in AT, and considerable experimental and clinical data is available concerning the two methods.

A number of AT paradigms have been described (Solomon and Brush, 1956; Bucher and Lovaas, 1968, Estes, 1969). The issue of a choice of a learning paradigm for AT has remained a vexed issue. There have been protagonists for avoidance conditioning (Feldman and MacCulloch, 1971; Morgenstern, Pearce and Rees, 1965) and protagonists for RCAS (Lovibond, 1970; MacDonough, 1972; Eysenck and Rachman, 1965; Rachman and Teasdale, 1969a).

Before discussing avoidance conditioning and RCAS, it may be noted that it has been claimed that voluntary responses mediated by the central nervous system (CNS) condition best under operant conditioning, whereas involuntary autonomic nervous system (ANS) responses are subject to classical conditioning (Mowrer, 1950, 1953). Such two-factor theories have been severely criticized (Miller and Weiss, 1969; Bandura, 1969). In spite of considerable controversy it has not been established that CNS and ANS responses are subject to different conditioning (Bandura, 1969; Kimble, 1961). Moreover, recent work has shown that instrumental conditioning of autonomic responses is possible (Miller and Weiss, 1969; Shapiro, Tursky, Gershon and Stern, 1969; but see Katkin and Murray, 1968 for an opposing view).

Avoidance conditioning

Feldman and MacCulloch (1965) adapted the technique of avoidance conditioning, for use in AT, and labelled their technique 'anticipatory avoidance conditioning' (AAC)[1]. The technique of AAC is important for several reasons. Firstly, much of AT carried out has been done with insufficient regard to experimentally derived principles of learning (Eysenck and Rachman, 1965). The development of AAC was an attempt to base AT on learning theory (Feldman and MacCulloch, 1965). Further, Feldman and his colleagues (Feldman, 1966, 1968; Feldman and MacCulloch, 1965,

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1. The term AAC will be used to refer specifically to the procedure developed by Feldman and MacCulloch, to distinguish it from avoidance conditioning in general. AAC appears to be an amalgam of operant, classical and aversion relief procedures (MacDonough, 1972; Rachman and Teasdale, 1969a). A brief description of AAC can be found in Appendix 1. A detailed description of AAC is available in Feldman and MacCulloch (1971).

1971; MacCulloch and Feldman, 1967; MacCulloch, Birtles and Feldman, 1971; MacCulloch, Feldman and Pinschoff, 1965) applied AAC with considerable and long term success to the treatment of homosexuality, although without success to the treatment of alcoholism (MacCulloch, Feldman, Orford and MacCulloch, 1966).

However, AAC has been severely criticized (MacDonough, 1972; but see Feldman and MacCulloch (1972) for a rejoinder to MacDonough). Although Feldman and MacCulloch (1965) rejected classical conditioning as a basis for AT, an examination of AAC reveals that the separate effects of classical and operant conditioning were not separated in the AAC method[1] (Barlow, 1972; Lovibond, 1970; Thorpe, 1972). Thus MacDonough (1972) criticised the AAC procedure used by Feldman and MacCulloch as 'theoretical smorgasbord'. The results obtained by Feldman and MacCulloch could be interpreted as being due to classical conditioning on trials when subjects were not allowed to avoid shock, rather than to operantly conditioned avoidance on trials where the subject was allowed to avoid (Bucher and Lovaas, 1968; Rachman and Teasdale, 1969a). Moreover, comparative studies have not shown that AT based on AAC was significantly more effective than AT based on classical conditioning (Feldman and MacCulloch, 1971; Jacobs, 1969).

Further, the rejection by Feldman and his co-workers of classical conditioning may have been based on a number of theoretical inaccuracies. An example of such an inaccuracy is the work of Estes (1944) who generalised that:

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1. A two-stage explanation of avoidance conditioning which involves classical conditioning as one aspect of avoidance conditioning has been propounded (Amsel and Cole, 1953; Kalish, 1954). Such theories are open to various criticisms (Hallam and Rachman, 1972).

> a response cannot be eliminated from an organism's repertoire more rapidly with the aid of punishment than without it ... it is not correlation of punishment with the response per se that is important, but the contiguity of the punishment with the stimuli which formerly aroused the response.[1]

But more recent work has shown these generalizations to be incorrect (Azrin, 1960; Boe and Church, 1968).

In addition, Feldman and MacCulloch appeared to have misinterpreted the work of Solomon and Brush (1956), which was concerned with the suppression of conditioned motor responses, not the suppression of positively rewarded instrumental behaviour (or appetitive and consummatory behaviour) as encountered in those conditions usually treated by AT. In fact, Solomon and Brush (1956), explicitly concluded that although avoidance conditioning effectively suppressed motor behaviour, classical conditioning was more effective for establishing conditioned anxiety responses. However, Feldman and his co-workers have recently, on the basis of their own research findings, retracted their earlier claims of the greater therapeutic efficacy of instrumental over classical conditioning in AT (Feldman and MacCulloch, 1972; MacCulloch, Birtles and Feldman, 1971).

It has also been pointed out that AAC is not analogous to instrumental avoidance as carried out in laboratory experiments (Lovibond, 1970). A further criticism of AAC is that on non-reinforced trials an avoidance response to male slides is punished, thus the acquisition of avoidance responses is impaired (MacDonough, 1972). Finally, a feature of AAC is the incorporation of aversion relief into the procedure in order to reduce heterosexual anxiety.

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1. In fact Estes found that bar pressing in rats was suppressed by punishment, although there was partial recovery from the effects of punishment. However, the present position of Estes appears to be that a response may be permanently suppressed by punishment (Estes, 1969).

However, there appears to be no evidence to support the contention that aversion relief reduces heterosexual anxiety (Barlow, 1973).

Response contingent aversive stimulation

The use of RCAS has been illustrated in a report where a compulsive masturbator was given a strong electric shock to his forearm, whenever a desire to masturbate was aroused by the sight of young girls (Jacobs, 1967). The procedure employed by Marks and Gelder (1967) is also illustrative of RCAS. A transvestite was asked to imagine that he was putting on some of his favourite deviant clothing. When he reported a clear image he was given a shock. Later the patient was asked to put on female clothing and shocked when actually doing so. Rachman and Teasdale (1969a) commented:

> Of all the electri. l techniques currently in use, those described by Marks and Gelder would seem to be the most satisfactory. It appears to be clinically effective and, except on some points, would seem to be entirely reasonable and justified in terms of experimental information.

Other reviewers have also favoured RCAS as the most suitable paradigm on which to base AT (Eysenck and Rachman, 1965; Lovibond, 1970).

RCAS has been relatively neglected in aversion conditioning (Bolles, 1967; Solomon, 1964). A factor contributing to the neglect of RCAS was probably the rejection by Thorndike (1932) of the hypothesis that punishment can weaken a learned response. But, Thorndike (1932) used punishment (verbal, not physically noxious) in an attempt to produce new learning and it is hardly similar to the situation in which punishment is used to suppress previously required appetitively motivated behaviour. In fact, RCAS has been shown to be effective in suppression of appetitively motivated consummatory behaviour (Azrin and Holz, 1966; Church 1969; Lovibond, 1970; Marks and Gelder, 1967; Rachman and

Teasdale, 1969a; Solomon, 1964). But, RCAS appears to be ineffective in suppressing escape/avoidance responses and even appears to facilitate such responses (Black and Morse, 1961).

There are also numerous reports describing the effectiveness of RCAS, based on painful electric shock, in suppressing various behaviours in psychotic children (Bucher and Lovaas, 1968).

RCAS has been shown to be most effective when escape from UCS is prevented (Azrin, 1960; Leitenberg, 1967). The availability of an escape reduces the suppressive effects of punishment and facilitates response recovery. In fact the effects of RCAS can be nullified by the availability of an escape response (Azrin, Hake, Holz and Hutchinson, 1965).

The decision to base AT, in the present research, on RCAS was determined by the simplicity of the method, in comparison to AAC and also by the fact that the weight of experimental evidence seemed to lean in favour of RCAS.

Azrin and Holz (1966) and Church (1969) have summarized the most important RCAS requirements and variables, which are listed in Appendix 2.

The role of motivation in aversion therapy

The work of Freund (1960) underlined the importance of positive motivation in determining the successful outcome of AT. Another example of the role of motivation is provided by Hammersly (1957) who described an alcoholic treated by AT. After discharge from hospital the client persisted in drinking for four hours, despite constant vomiting, until he had successfully broken the conditioning. Persons undergoing treatment as a result of external pressure can be expected to do badly in treatment (Hallam and Rachman, 1972). Thus it has been reported that homosexuals arriving for treatment under duress or as a result of running foul of the law have responded poorly to treatment (Curran and Parr, 1957; Feldman and MacCulloch, 1971). Persons seeking treatment

under duress are hardly likely to be well motivated. Other evidence indicates that attitudinal factors can facilitate conditioning (Dawson and Reardon, 1969; Kimble, 1967).

The degree of suppression of a positively reinforced behaviour by a noxious stimulus has been shown to be an inverse function of the motivation for that behaviour (Hoffman, 1969). Punishment of a response has been rendered almost ineffective, by increasing motivation, in the subjects to emit the punished response (Azrin, Holz and Hake, 1963). However, after complete suppression of response an increase in motivation does not appear to be effective in restoring the suppressed response (Klee, 1944; Masserman, 1943; Storms, Boroczi and Broen, 1962). The principle can be stated, then, that the higher the motivation of a subject to emit a response, the higher the intensity of the noxious UCS required in order to suppress that response (Boe and Church, 1968; Church, 1963).

The conditions treated by AT usually consist of undesirable consummatory behaviours, the performance of which leads to immediate positive reinforcement. But suppression of a positively reinforced response may be affected by amount of 'reinforcement loss' (Sidman, 1960). Sidman, using monkeys, found that if conditioned suppression (of a positively reinforced bar pressing response) resulted in more than about 10 per cent reinforcement loss, the conditioned suppression disappeared. The above suggests that if homosexual behaviour is to be permanently suppressed, the cost of such suppression should not be loss of all sexual release. Alternate heterosexual behaviour leading to sexual release should be encouraged in order to reduce motivation for homosexual release. Further, Dinsmoor (1952) tested the effects of punishment on a food response, under conditions of greater food deprivation the responses were suppressed to a lesser extent than under conditions of lesser food deprivation.

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The effects of aversion therapy

Considerable uncertainty exists as regards the effects of AT (Bandura, 1969; Rachman and Teasdale, 1969a). At present it does not seem possible to explain the effects of AT in terms of any single theory e.g. in terms of cognitive, behavioural or physiological change (Hallam and Rachman, 1972; Hallam, Rachman and Falkowski, 1972). Hallam and Rachman (1972) discussed various theoretical possibilities as regards the effects of AT.

Such evidence as is available suggests that AT leads to a loss of interest in, a devaluation of, indifferences towards and suppression of drive as regards the previously attractive deviant behaviour, rather than leading to conditioned anxiety or avoidance (Bandura, 1969; Hallam and Rachman, 1972; Hallam, Rachman and Falkowski, 1972; Lovibond, 1968; Rachman and Teasdale, 1969a). Thus alcoholics treated by AT have tended to develop repulsion or indifference, rather than conditioned anxiety, towards alcohol (Hallam, Rachman and Falkowski, 1972). Various authors have postulated that AT acts by 'suppression' (Azrin, 1960; Appel, 1963; Azrin and Holz, 1966; Church, 1969; Church, Raymond and Beauchamp, 1967). The above may be referred to as a cognitive and/or drive explanation of the effects of AT. Estes (1969) postulated that AT involves the suppression of positive drive by negative drive. The term 'negative incentive motivation' would seem to neatly describe the effects of AT (Logan, 1969).

There is some evidence that, following aversion conditioning, conditioned avoidance behaviour persists after the disappearance of conditioned autonomic response (Bandura, 1969). Various writers have claimed that in aversion conditioning conditioned autonomic responses extinguish rapidly after withdrawal of the UCS (Bandura, 1969; Chatterjee and Erikser 1962; Grings and Lockhart, 1963; Spence, 1966). For example, Solyom and Miller (1965) gave homosexuals electric shocks whilst pictures of male nudes were projected onto a screen. It was found that although clinical

observation indicated an abstention of homosexual behaviour after treatment, there were nevertheless no changes as indicated by plethysmograph and GSR reactions to pictures of nude males.

On the other hand, there is also evidence that strongly persistent conditioned autonomic responses, which persist after the disappearance of avoidance behaviour, are established by aversion conditioning (Gantt, 1953, 1964; Hammersley, 1957; Sanderson, Campbell and Laverty, 1964). Thus, Bancroft (1970) showed that although homosexuals treated by AT displayed a decreased erection response to homosexual stimuli after treatment, there was no significant correlation between reduction in erection response and reduction in homosexual behaviour. Clients who displayed no reduction in homosexual behaviour after AT displayed virtually as much erection suppression as those clients who responded to the treatment (Bancroft, 1970). More recently, it has been suggested that AT may produce a specific psychophysiological reaction such as cardiac acceleration (Hallam and Rachman, 1972).

Marks and Gelder (1967), described in detail the physiological, behavioural and attitudinal changes which took place during AT. It was found that with repeated exposure to the UCS clients experienced increasing difficulty in visualizing the deviant images. Marks and Gelder were able to show that the effect was not due to habituation to the image but rather to the effects of the UCS. The increased time latency for obtaining the deviant sexual images corresponded to an increase in time taken for the clients to achieve an erection in response to the deviant sexual stimuli. It may be noted that AT has been shown to be effective in eliminating deviant sexual fantasies (Marks, Gelder and Bancroft, 1970).

Marks and Gelder (1967) also found that AT had a remarkably specific effect. Thus in the treatment of a transvestite, when the first item treated was 'panties', erections to 'panties' were fully eliminated after a few sessions of treatment. But, erections to other transvestite stimuli remained present until they were

each in turn treated. Other work has also demonstrated specificity of the effect of AT (Birnbauer, 1968; Risley, 1968). The above results may indicate that the effect of the AT was a peripheral suppression of behaviour rather than a central motivational change. However, other workers have found that the effects of AT generalized to a marked extent in the treatment of compulsive behaviour (Kenney, Solyom and Solyom, 1973).

An 'holistic' approach to aversion therapy

The writer has in an earlier publication described in detail a 'three-factor' or holistic approach to behaviour modification and has analysed a case of homosexuality in terms of the holistic approach (Jacobs, 1972). In brief, the holistic approach views behaviour as having motor, cognitive and autonomic components and stresses the need for simultaneous treatment of all three components. Thus homosexuality can be described as consisting of homosexual behaviour, homosexual cognitions and fantasies and mediational homosexual drive, desire or arousal. The above can be paraphrased as the way a homosexual acts, thinks and feels. The following section will attempt to show that AT which does not include treatment of all three components, described above, is incomplete treatment.

In the treatment of homosexuality, homosexual drive or arousal should not be ignored as a CS, especially in view of the fact that such arousal is far more 'real-life' than are static photographs. A danger involved in ignoring drive is that an aversion or avoidance might be conditioned to particular acts or stimuli, but leave drive untouched, so that different elicitors may evoke different homosexual behaviour. Thus, in Quinn and Henbest's (1967) research, aversion was conditioned only to a particular kind of alcohol (whisky) whereas the 'alcoholic drive' was left untouched and the clients tended to simply switch their drinking to a different kind of alcohol. It might have been better to have

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conditioned aversion, not to particular types of alcohol, but rather to the desire to drink, i.e. the motivating core of behaviour. Similarly, it is postulated that in the treatment of homosexuality, AT should be directed at homosexual drive rather than pictures of particular men (Jacobs, 1972; McConaghy, 1970; Marks and Gelder, 1967).

It has been suggested that punishment of consummatory responses is effective by virtue of drive reducing effects rather than by peripheral suppression of behaviour or the conditioning of competing anxiety responses (Lovibond, 1970; Solomon, 1964). The work of Lichtenstein (1950) and Quinn and Henbest (1967) already described, supports the contention that the punishment of underlying drive is required when the suppression of a consummatory habit is desired.

Mowrer (1950) attacked that point of view which regarded 'symptoms' as direct conditioned responses or reflexes to conditioned stimuli in the external environment, rather than 'habits' which serve to eliminate an inner state of anxiety. According to the point of view espoused by Mowrer, homosexual behaviour can be viewed as a habit associated with particular stimuli, learned because it reduces an inner drive. Thus to merely condition aversion to homosexual behaviour and cues without dealing with underlying drive, is analogous to forgetting that Pavlov's dogs, in the conditioned salivation experiments, were hungry or that food serves as a reinforcer, precisely because a subject is hungry.

Eysenck (1960) distinguished between autonomic and motor conditioned reactions (see also Lazarus, 1965). Eysenck went on to write that motor reactions are frequently motivated by their drive reducing properties vis-a-vis the historically earlier conditioned autonomic responses. In addition, Eysenck (1960) attacked treatment which led to the extinction of motor responses without simultaneous extinction of the conditioned autonomic

response os . of 'very partial use'. Sexual deviation, compulsive behaviour and alcoholism can be viewed in terms of both behaviour and motivating drive. If so, therapists employing AT have been dealing largely with the former aspect. It is also postulated that partial conditioning of this kind is a factor in the high rate of relapse frequently encountered using AT. Some evidence has been provided for theories that AT acts on a drive level (Estes, 1969; Logan, 1969).

The 'holistic' approach, derived by the writer, attempts to contemporaneously suppress the undesirable behaviour, the internal motivating drive and the cognitions and fantasies associated with the undesirable behaviour (Jacobs, 1972). 'Holistic aversion therapy' (HAT) may be distinguished from 'monistic aversion therapy' (MAT) which deals only with behaviour and ignores drive and cognitive factors. The holistic approach may, for the sake of clarity, be juxtaposed with a monistic approach as used by Feldman and MacCulloch (1971). Feldman and MacCulloch stated that homosexual behaviour could be described as having both an 'intrinsic mediational component' and an 'extrinsic behavioural component'. However, they made clear that in AAC the former component was ignored and that the aim of AAC was to 'suppress the usual response of looking in reality or phantasy at an attractive, but socially inappropriate stimulus' (Feldman and MacCulloch, 1971).

Having dealt with variables relating specifically to AT in the preceding sections, the remaining parts of the Introduction will deal in general with problems of outcome research and reviews of the treatment of homosexuality and OCR's.

## Some problems of outcome research

The minimum requirements for outcome research in therapy are the use of control and experimental groups, the use of pre- and post-treatment evaluation procedures and an adequate follow-up period (see also Goldstein, Heller and Sechrest, 1966; McNamara and MacDonogh, 1972).

Frank(1959a) reviewed the problems of control is psychotherapy. In particular, he discussed definition of the sample of subjects, the division of sample into treatment and control groups, the need to control the situational variables, the control of the placebo effect, the need for acceptable empirical outcome criteria and follow-up studies. Relatively few of the studies reviewed thus far have met the requirements of adequate controls (Eysenck, 1960). Further, some reviewers have concluded that most behaviour therapy researches have not been adequately designed (Gelfand and Hartman, 1968; Pawlicki, 1970).

There is considerable evidence (Goldstein, 1962) that the expectations held by clients, concerning outcome of psychotherapy, play a part in determining the outcome of treatment. It is therefore necessary to ensure that all subjects in the various experimental and control groups have similar expectations.

Coates (1964), has argued, in opposition to Wolpe (1962), that in all conditioning techniques the client-therapist relationship has played a major if not always recognised part (see also Meyer and Gelder, 1963). Therefore, the effects of the specific treatment methods must be distinguished from the non-specific effects of the client-therapist relationship.

It may be noted that the term 'control group' may be largely misleading, since, it may be impossible to have a completely untreated control group (Goldstein and Dean, 1966). Subjects placed in no treatment control groups may obtain all kinds of advice from friends, family and doctors.

Of considerable relevance in outcome studies is the placebo effect (Rosenthal and Frank, 1958). It is necessary that changes due to the non-specific effects of the therapist's personality, the client-therapist relationship, the attention and understanding given to the client, his faith in the therapist, client's desire to please the therapist and the client's belief that he will be helped, be distinguished from the effects of the specific

treatment procedures. In fact, Frank (1959b) suggested that the placebo effect may be the major determinant of change in the client. It has been argued that clients selected for no-treatment control groups should have minimal contact with the therapist as the placebo effect may be brought into operation merely through interviewing and testing of clients (Goldstein, 1960; Goldstein, Heller and Sechrest, 1966).

A further problem in outcome research is that of 'regression' (Cambell and Stanley, 1963). Regression refers to changes in behaviour which are not due to the effects of treatment but rather to the fact that clients usually enter the treatment at the point at which severity of the presenting problem is at its maximum. Therefore, there is no change that can occur except improvement.

It is possible that the subjects themselves may serve as their own controls, by comparing pre-treatment and post-treatment behaviour. Such a comparison will show change but not whether the change is due to the passage of time, the placebo effect, or the actual treatment.

The definition of outcome criteria presents a major difficulty in outcome studies. Unless outcome criteria are very strictly defined the results obtained in research will lose their meaning in a dispute as to the meaning of improvement (Bergin, 1963). Zax and Klein (1960) were of the opinion that few criteria used by the researchers, up to that time were adequate. The problem is compounded by the vagueness and unreliability of psychiatric diagnostic categories (Hunt, Wittson and Hunt, 1953; Schmidt and Fonda, 1963). The latter not only makes duplication of the sample difficult, but there is no clear definition of the problem to be treated.

A practical solution of the problem of outcome criteria appears to be the suggestion of describing the clients in terms of 'target behaviour' (Frank, 1959a; Goldfried and Pomeranz, 1968).

The aim of therapy being to modify or eliminate these specific target behaviours. Such an approach is particularly appropriate to a behaviour therapy technique such as AT, since the behaviour therapy standpoint views neurosis as 'persistent unadaptive habits' and its task as the modification of such habits (Eysenck, 1960; Wolpe, 1958). Wolpe and Lazarus (1966) wrote:

> the most appropriate way of measuring success would be to clarify and enumerate the unadaptive habits before therapy, and then, after therapy, to assess to what extent each habit has been eliminated.

Finally, division of subjects into the various treatment and control groups presents a problem (Goldstein and Dean, 1966). Although it is desirable to match groups as closely as possible, it is clearly impossible to match them perfectly in terms of all the variables. The next best may be to match the groups on many major variables as possible, but this approach is limited by the fact that each additional variable used increases the size of the groups. Another method is to randomly assign clients the various treatment and control groups. But random allocation may not lead to groups comparable on major variables. Groups may also be matched by stratified sampling of major categories without matching individuals.

## The treatment of homosexuality

A review of the literature concerning psychotherapeutic and physical means of therapy tends to indicate the failure of these methods as effective methods of treatment (Feldman and MacCulloch, 1971). In fact writers have expressed doubts about the very curability of homosexuality (Curran, 1947; Curran and Parr, 1957). Curran (1947) compared 25 homosexuals who had received intensive psychotherapeutic treatment, with an equal number of homosexuals who had received no treatment at all. He found no significant difference in the intensity of homosexual feeling between the two

groups after a careful and lengthy follow-up. Harris (1948) found no psychotherapeutic treatment of any use and felt that therapy was only of value in cases of bisexuality.

As regards AT, the position may be summed up by saying that the efficacy of AT in the treatment of homosexuality has not yet been proved (Feldman, 1966; Feldman and MacCulloch, 1971; Freund, 1960; Rachman and Teasdale, 1969a; Wilson and Davison, 1974). However, there have been reports of modification of homosexual behaviour by AT (Birk, Huddleston, Miller and Cohler, 1971; Feldman and MacCulloch, 1971; Jacobs, 1969; MacCulloch, Birtles and Feldman, 1971; McConaghy, 1971).

Certain psychoanalytic writers have claimed to have treated homosexuality with some success (Allen, 1958; Bieber, Bieber, Dain, Dince, Drellich, Grand, Grundlach, Kremer, Malvina, Wilber, Cornelia and Bieber, 1963; Ellis, 1956; Ovesey, Gaylin and Hendin, 1963). Other writers reported poor results using psychoanalysis to treat homosexuality (Coates, 1964; Curran and Parr, 1957; Hadfield, 1958; Rubenstein, 1958; Woodward, 1958). A major difficulty in evaluating many studies is the nebulousness of outcome criteria. It would seem that the chief benefit obtainable from psychoanalysis is that it might enable the homosexual to achieve greater acceptance of his problem, rather than a change in sexuality (Freud, 1935).

Various physical treatments used, and proved ineffective, included such drastic measures as castration and vasectomy (Ellis, 1942) and the injection of male hormones (Lurie, 1944). But hormones influence the strength of the sexual drive but not its direction (West, 1968). Further there is evidence that the direction of sexual interest is largely influenced by psychological and environmental conditioning and not by sexual hormones.

Various writers have emphasized the importance of masturbation fantasies in maintaining and reinforcing sexual behaviour (Evans, 1968; McGuire, Carlisle and Young, 1965). Thus the suggestion

has been made that homosexuals undergoing treatment should be encouraged to alter their masturbation fantasies from homo- to heterosexual images (Bancroft, 1969; Jacobs, 1972; Rachman and Teasdale, 1969b).

Moll (1933) developed 'associations-therapy' which aimed at redirecting the patients' 'inclinations' from male to female 'love-objects'. Attraction to boys was used as the basis for developing an attraction to boyish-looking females. The clients' imagination was directed by means of persuasion, erotic literature and pictorial matter in order to encourage the 'normal' associations. A clear formulation of the technique was not given and insufficient research was done to allow it to be evaluated.

Freund (1960) wrote: 'There has been no proof of the efficacy of any form of treatment as applied to homosexuality'. He concluded that no qualitative difference as regards efficacy in outcome could be shown, whether the psychotherapy applied was of psychoanalytic, non-verbal or non-interpretive kind. The significant factor, Freund claimed, in any therapeutic success appeared to be based on the principle of discouragement of homosexual activities and the encouragement of heterosexual activities.

## The description and treatment of obsessive-compulsive ruminations (OCR's)

OCR's present special nosological problems due to their private, internal and subjective nature. OCR's involve preoccupation with and the inability to exclude persistent trains of thought, phrases or even single words from consciousness. OCR's are anxiety inducing and fall within the category of 'anxiety elevating' obsessions (Wolpe, 1958), often involving guilt about past actions, harming others, carrying out of distasteful sexual acts, blaspheming, etc. and are thus a cause of extreme stress. Nemiah (1967) gave the following as the main features of obsessive-compulsive neuroses;

(1) An idea or impulse intrudes itself insistently, persistently and impellingly into the individual's conscious awareness.

(2) A feeling of anxious dread accompanies the central manifestations and frequently leads the individual to take counter measures against idea or impulse.

(3) The obsession or compulsion is ego alien - it is expressed as being foreign to and not a usual part of one's experience of oneself as a psychological being, it is undesired, unacceptable and uncontrollable.

(4) No matter how vivid and compelling the obsession or compulsion, the individual recognises it as absurd and irrational, he retains his insight.

(5) The person suffering from these manifestations feels a strong need to resist them.

Metzner (1963) described the compulsive thoughts as

> prolonged spells of brooding, doubting and speculation ... very strong temptations or impulses to do things, such as kill, confess, attack or steal certain objects, which are viewed with the utmost horror, disgust, shame or anxiety by the patient experiencing them.

Some behaviour therapists using mainly electrical AT and thought stopping techniques have claimed some success in treating OCR's (Jacobs, 1967, Kenny, Solyom and Solyom, 1973; Kushner and Sandler, 1966; Stern, 1970; Walton and Mather, 1963; Watts, 1971; Yamagami, 1971). Rachman (1971) suggested desensitization and habituation as the methods of treatment. But Eysenck and Rachman (1965) found little evidence of the effectiveness of desensitization in the treatment of OCR's. A study by Meyer (1966) indicated that compulsive fears might be extinguished by showing that 'nothing disastrous does happen' if the compulsive fears are confronted. However, in spite of the isolated reports of successful treatment, behaviour therapy has not been generally effective (Solyom, Zamanzadeh, Ledwidge and Kenny, 1971). Most

psychoanalytically orientated writers have viewed treatment in these cases with pessimism (Nemiah, 1967; Rado, 1959).

It has been suggested that treatment of OCR's is unlikely to succeed in cases where the OCR's are of long duration (Nemiah, 1967; Rado, 1959).

## Aims

The principal aims of the research were:

(1) To test the hypothesis that AT based on RCAS is an effective treatment of homosexuality.

(2) To test the hypothesis that AT based on RCAS is an effective treatment of OCR's.

(3) To test the hypothesis that 'holistic' AT is more effective than 'monistic' AT in the treatment of homosexuality.

(4) To determine the influence on the outcome of the treatment of homosexuality and OCR's, of such variables as conditionability, extraversion, neuroticism, age, motivation and duration of the behaviour to be eliminated.

## PROCEDURE

The procedure part of this work will be divided into the following sections: clients, psychometric tests and apparatus, method and assessment of outcome.

### Clients

The clients consisted of 80 homosexuals and 60 compulsive ruminators. Clients were referred by general practitioners and psychiatrists in private practice, by registrars at the General Hospital (Psychiatric Ward), Johannesburg or Tara Hospital, Johannesburg. All homosexuals and compulsive ruminators referred to the writer after July 1968 were included in the study, unless excluded as unsuitable. Homosexuals and compulsive ruminators not included were those falling into one or more of the following categories:

(1) Psychotics or query psychotics.

(2) Clients suffering from endogenous depression. It should be noted that OCR's are often associated with 'endogenous' depression (Rachman, 1971). Special attention was therefore paid to the diagnosis of endogenous depression amongst the clients suffering from OCR's.

(3) Brain damaged or mentally retarded persons.

(4) Since drugs affect conditionability (Trouton and Eysenck, 1961), clients required to remain on chemotherapy, in particular anti-depressant or tranquillizer medication, were also excluded.

The diagnosis of psychotic, endogenous depression, mental retardation or brain damage were made by the referring doctors.

Client data will be described separately for the homosexuals and compulsives.

All homosexuals were males. Feldman and MacCulloch (1971)

classified homosexuals as primary or secondary. Primary homosexuals are those who have had no heterosexual experience, secondary homosexuals have had some heterosexual experience. The clients consisted of 47 secondary and 33 primary homosexuals. It may be noted that the homosexual behaviour for which clients sought treatment, was relatively long standing and chronic (mean duration 9.4 years, SD = 5.1 years). The duration of the homosexual behaviour was calculated from time of onset of the homosexuality (i.e. homosexual behaviour or fantasies) until appearance for treatment. The mean age of the homosexuals was 29 years (SD = 8 years).

It may be noted that 32 of the homosexuals (approximately 40 per cent) had been exposed to therapy, of some form or other, prior to being included in the present study. Twenty five had previously undergone psychoanalysis, supportive or interpretive therapy, 5 had been treated by injection of male hormones and 2 treated by AT, in all cases without cure.

It can also be noted that response to previous therapy was poor, as only 4 of the 32 clients treated were improved as a result of the prior therapy. Response to previous therapy was assessed on the basis of reports from the referring doctor or the subjective reports of clients. But, response to previous therapy is no reflection on the effectiveness of the various treatments used, as only failures of the previous therapies were referred to the writer.

The largest number of homosexuals (N = 35) appeared for treatment of their own accord and volition. However, a considerable number (N = 24) appeared for treatment as the result of varying degrees of persuasion and pressure by parents, medical practitioners, spouse or friends. The motivation for another group in seeking treatment (N = 12) was a brush with the law for such acts as indecent exposure, paedophillia, and soliciting. Four clients had been referred for treatment of disorders other than homosexuality, but on learning that treatment for homosexuality was available, had

requested treatment for their homosexuality. Finally, 5 homosexuals had sought treatment as the direct result of unhappy and broken love affairs.

The compulsives consisted of 15 females and 45 males. The OCR's for which clients sought treatment were relatively long standing and chronic (mean duration 4.7 years, SD = 2.9 years). Duration of OCR's was calculated from time of onset of OCR's to time of appearance for treatment. Mean age of compulsives was 28 years (SD = 8 years).

Twenty three (approximately 40 per cent) of the compulsives had had previous exposure to therapy prior to being treated in the present survey. Response to previous therapy was poor in that only 7 of the 23 clients previously treated appeared improved as a result of the prior treatment. Response to previous therapy was assessed on the basis of reports from the referring doctor or the subjective reports of the clients. Previous unsuccessful treatment comprised chemotherapy (N = 15), particularly tranquillizers and anti-depressants, and supportive therapy (N = 8).

The OCR's experienced by clients tended to be all pervasive, and extremely debilitating, in that they pervaded the clients' whole lives and made daily living difficult. The OCR's constantly and irresistably intruded the clients' thoughts and were a constant source of anxiety, guilt and depression. The sompulsives, without exception, experienced their particular OCR's as frightening, terrifying and alien. The OCR's concerned thoughts of harming self, e.g. thoughts of committing suicide in non-suicidal persons, of slashing oneself, jumping out of windows (N = 7); OCR's of harming or murdering loved ones, e.g. by slashing, stabbing, drowning, strangling (N = 10); hypochondriacal OCR's, e.g. ruminations about dying, contracting incurable diseases, about going mad (N = 13); sexual OCR's, e.g. ruminations about exposing oneself, committing rape, being homosexual in non-homosexuals, sexually assaulting friends, family or strangers (N = 11); OCR's

concerning carrying out embarrasing activities in public, e.g. uncontrollable screaming, laughing, crying, shouting and running amok (N = 7); and ritualistic OCR's, e.g. thoughts of doors being unlocked, windows open or stoves not switched off (N = 12).

All compulsives sought treatment of their OCR's of their own free will.

## Psychometric tests and apparatus

Psychometric instruments used consisted of the Kinsey Scale (KS), the Eysenck Personality Inventory (EPI) and a motivation scale (MS).

### The Kinsey Scale

The KS (Kinsey, Pomeroy and Martin, 1949) consists of a 7 point scale and was used to rate degree of homosexuality. The KS is the instrument customarily given for this purpose (Feldman and MacCulloch, 1971).[1] It is particularly useful in determining changes in homosexual behaviour as it describes heterosexual-homosexual behaviour as falling along a graded continuum rather than as an all-or-none phenomenon. The KS is described in Appendix 3.

### The Eysenck Personality Inventory

The EPI (Eysenck and Eysenck, 1964) and its progenitors, the

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1. Various psychophysiological indices, such as the penis plethysmograph (Bancroft, Jones and Pullan, 1966) the pupil reflex (Hess, Seltzer and Shlien, 1965); and the galvanic skin response (GSR) (Solyom and Miller, 1965) have been used as measures of homosexual arousal. However suppression of erection does not necessarily correlate with suppression of homosexual behaviour (Bancroft, 1970), and the usefulness of the pupil reflex as a measure of sexual arousal has been questioned (Scott, Wells, Wood and Morgan, 1967), as has been the GSR (Solyom and Miller, 1965).

Maudsley Personality Inventory (Eysenck, 1959) were designed to measure neuroticism (N) and extroversion (E). N refers to the 'general emotional lability of a person, his emotional over-responsiveness and his liability to neurotic breakdown under stress' and E to 'the outgoing, uninhibited, sociable proclivities of a person' (Eysenck 1957, 1959). In addition to the N and E scales a smaller number of items in the EPI serve as a lie scale in order to detect individuals attempting to fake good. The EPI consists of 57 questions, 24 of which measure N, 24 measure E and 9 consist of lie questions.

The inclusion of the EPI in this study was determined by evidence that introverts condition rapidly and strongly, whereas extraverts condition slowly and poorly (Eysenck, 1957; Franks, 1957), although there is some contradictory evidence (Kelly and Martin, 1969; Martin, Marks and Gelder, 1969). Further, although it has been suggested that high levels of neuroticism correlate positively with conditioning (Spence, 1964), it has also been claimed that high N scores relate negatively to outcome in AT (Feldman and MacCulloch, 1971). In addition, highly anxious subjects have been shown to exhibit greater than normal stimulus generalization gradients (Mednick and Freedman, 1960). It was therefore, felt necessary to include a measure of both E and N in order to assess their effects on outcome of treatment.

The Motivation Scale

In order to measure the motivation of clients for change a crude motivation scale was devised to assess the motivation of the client in seeking treatment, particularly to determine whether he had sought treatment of his own free will (Appendix 4). The MS included rating scale to measure desire for change and intensity of the problem. A rating of intensity of the problem was obtained as it was felt that the intensity of the problem might be an indication of drive. Therefore, if a client only considered his

problem to be very slight, his motivation for change might be less than a client who considered his problem very severe. The scoring of the MS is described in Appendix 4.

The Conditioning Apparatus

The conditioning apparatus for carrying out AT was specifically designed for the purpose of this study, and incorporated the following features; the delivery of a powerful and variable, but not physically harmful shock; the presentation of a brightly illuminated pictorial CS under conditions of minimal interference by competing visual stimuli in the environment; a variable CS-UCS interval and simultaneous termination of CS and shock.

A side view of the apparatus can be seen in Figure 1 (see page 39). The viewing box (A) is entirely light proof, but is illuminated by 2 interior light bulbs. The viewer (b), consists of moulded rubber to fit the contour of the face and a removable sliding panel (d) serves as a screen to which pictures are attached. A client peering through the viewer looks directly at the screen. The light bulb (c) serves to indicate that the interior of the box is illuminated. Current and voltage are read off milliameter (f1) and voltmeter (f2) respectively (panel F). It should be noted that the milliameter consisted originally of a voltmeter which was converted to a milliameter by placing a shunted resistance load of $\pm$ 150 K ohm in parallel across the meter. The manual control switch is indicated by g, while the electrodes are marked e. The control box is designated by H.

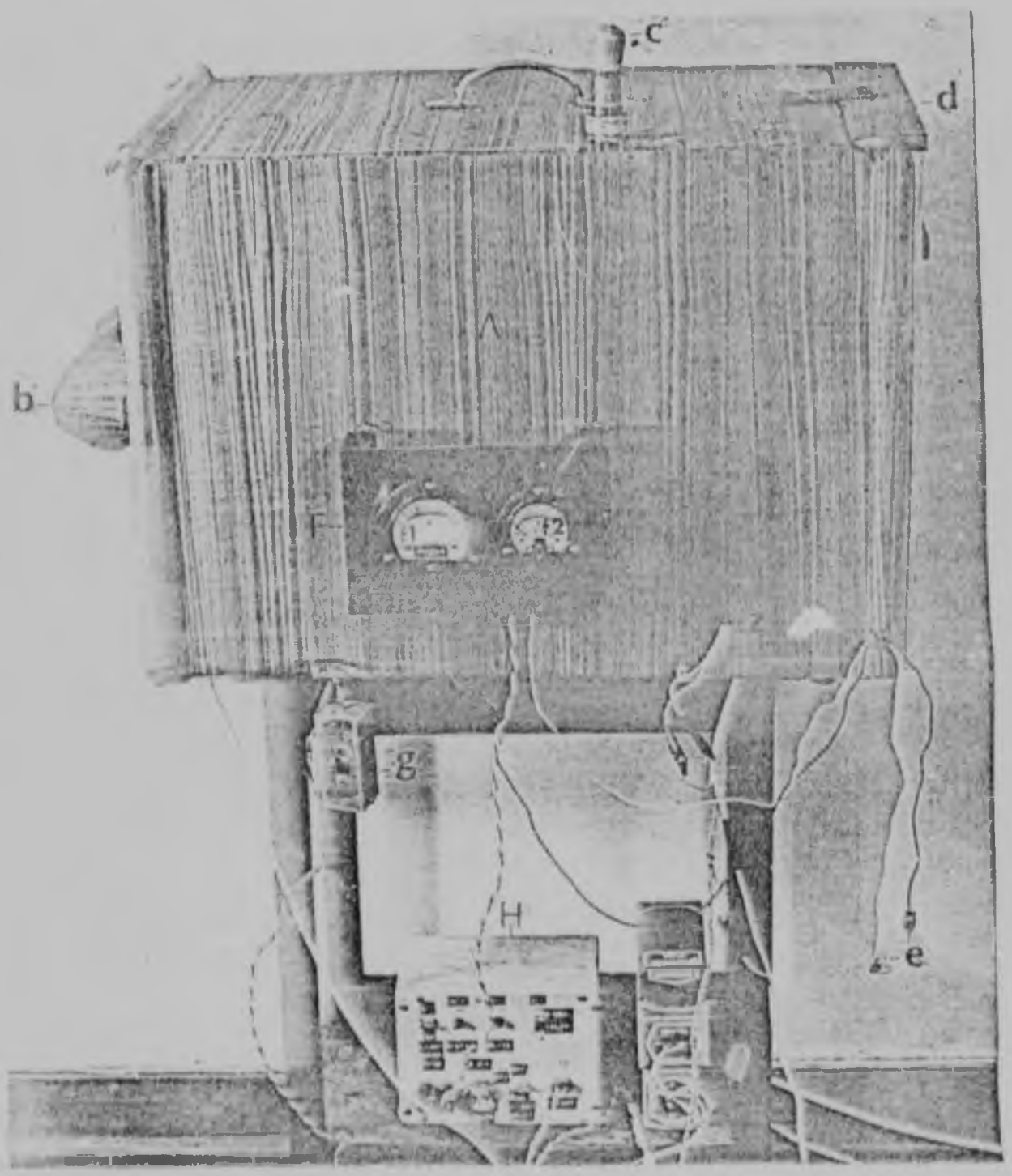



Figure 1. Side view of conditioning apparatus

The various controls on the control box can be seen in Figure 2 below. The apparatus was programmed to allow for a 0.5 sec (switch h3), a 3 sec (switch h4) and a 8 sec CS-UCS interval (switch h6). By CS-UCS interval is meant interval between illumination of viewing box and onset of shock. Four different intensities of shock are available (switch h5). CS and UCS are simultaneously terminated either by the manual control switch (g1) or by the various activating switches (h3, h4 or h6) respectively. A further feature of the apparatus is the override switch (h2) which when activated causes immediate delivery of shock and is not terminable by either the manual control switch or the other switches. Finally, presentation of CS (illumination of viewing box) without subsequent delivery of UCS is also available (switch h1).

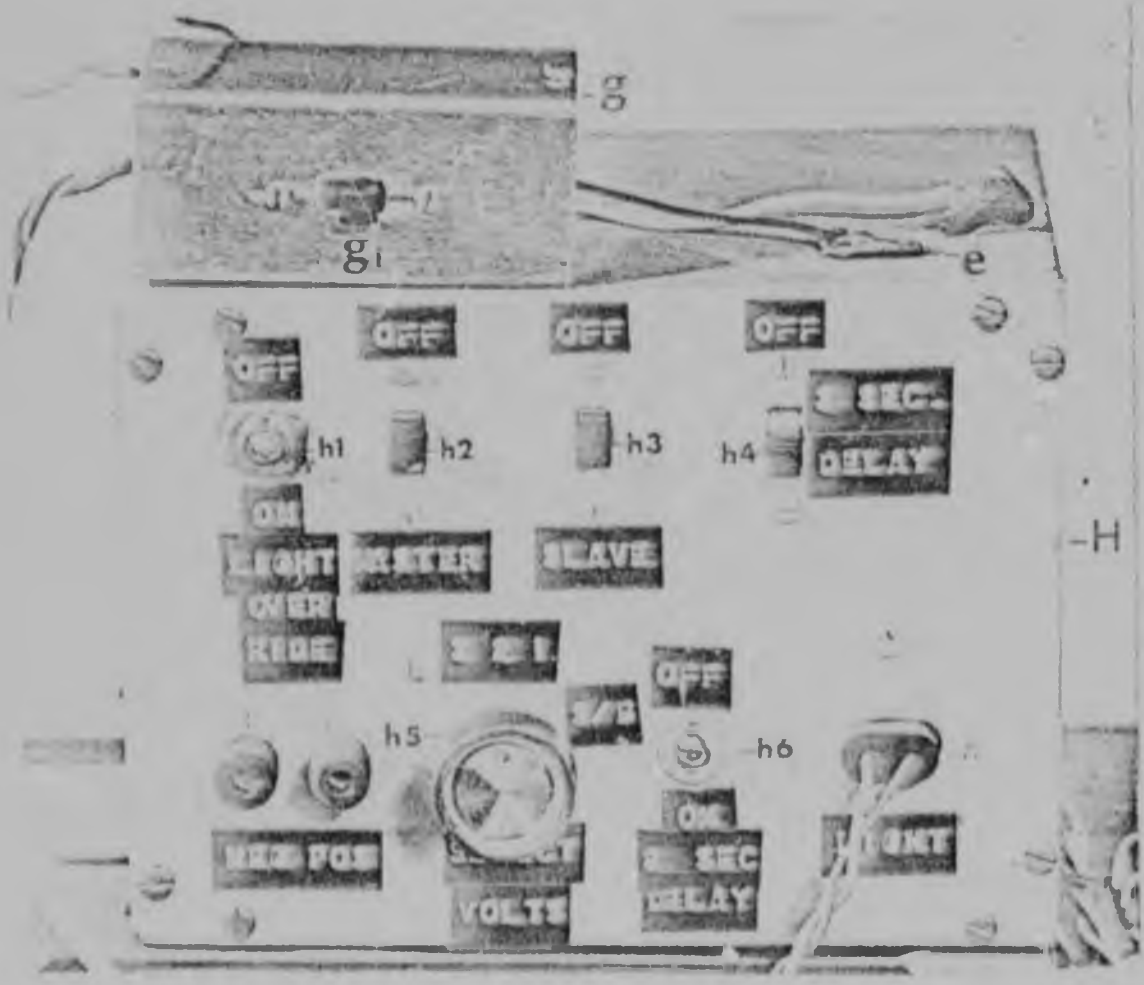



Figure 2. Control box of conditioning apparatus

The various controls on the control box can be seen in Figure 2 below. The apparatus was programmed to allow for a 0.5 sec (switch h3), a 3 sec (switch h4) and a 8 sec CS-UCS interval (switch h6). By CS-UCS interval is meant interval between illumination of viewing box and onset of shock. Four different intensities of shock are available (switch h5). CS and UCS are simultaneously terminated either by the manual control switch (g1) or by the various activating switches (h3, h4 or h6) respectively. A further feature of the apparatus is th. override switch (h2) which when activated causes immediate delivery of shock and is not terminable by either the manual control switch on the other switches. Finally, presentation of CS (illumination of viewing box) without subsequent delivery of UCS i. also available (switch h1).

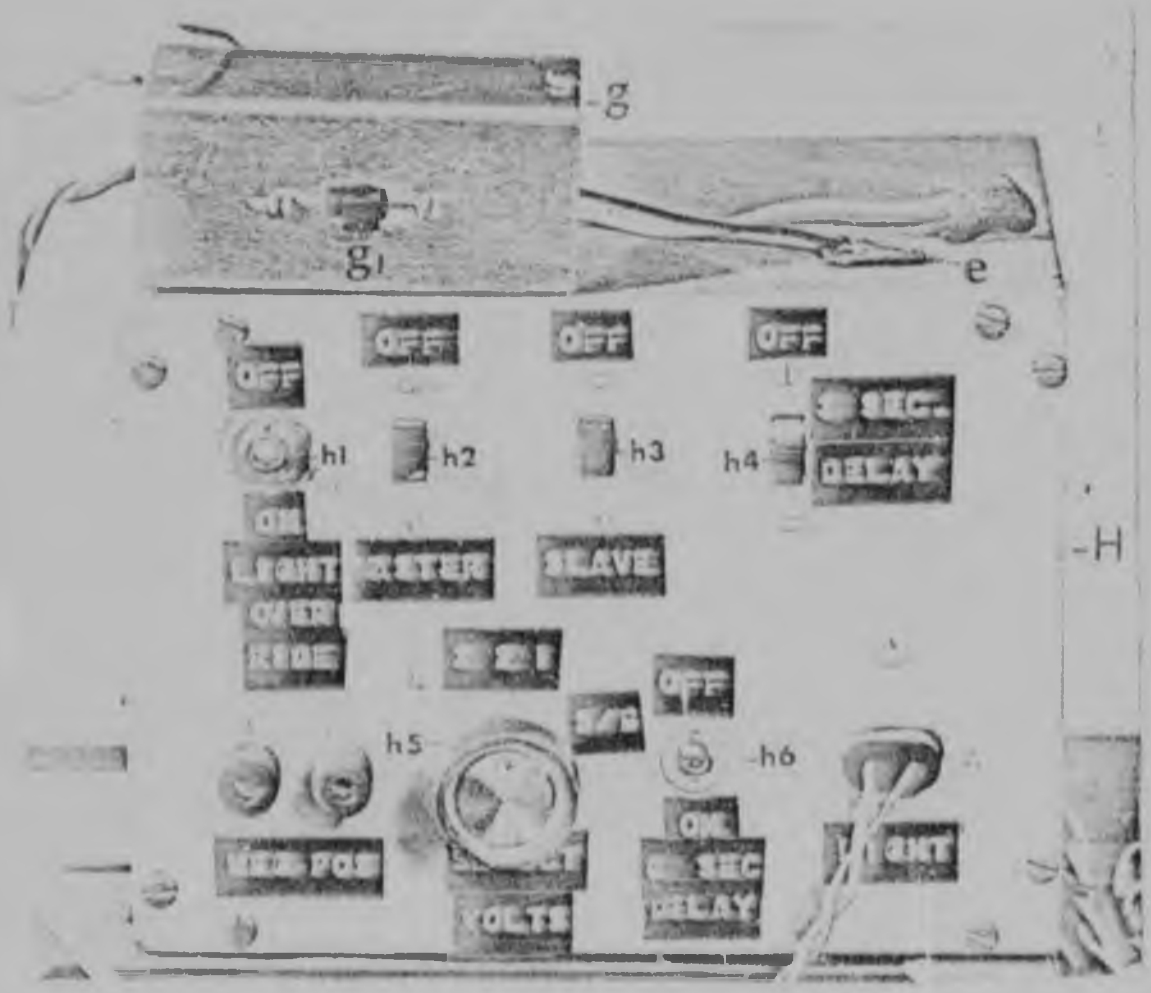



Figure 2. Control box of conditioning apparatus

The front view of the viewing box can be seen in Figure 3 below.

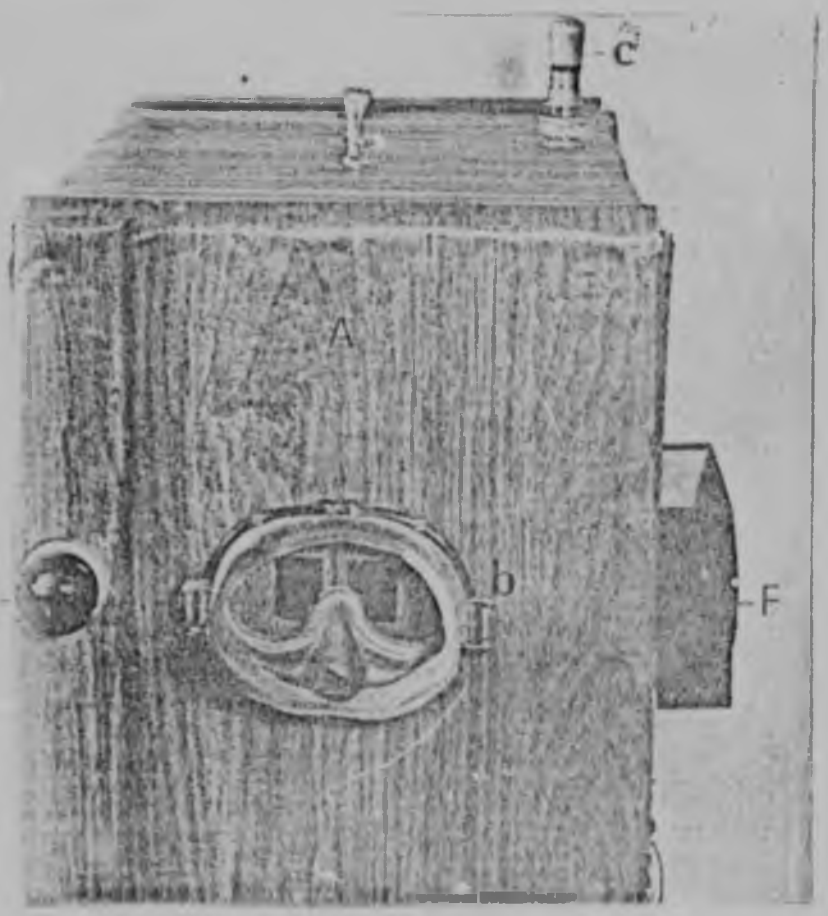



Figure 3. Front view of conditioning apparatus

Figure 4 (see page 42) illustrates a client connected to the apparatus during conditioning.

The apparatus used to condition the finger withdrawal response (FWR) consisted of a copper bar approximately 40cm long, 12cm wide and standing 5cm high. During conditioning of the FWR one of the leads from the conditioning apparatus was attached to the copper bar by means of a hole drilled in one end of the copper bar. The other lead was attached to the preferred forearm of the client. The CS consisted of an independent, battery powered bell.

Having described the conditioning apparatus the technical data pertaining to the apparatus will now be given. The circuit of the apparatus can be seen in Appendix 5. It may be noted that the

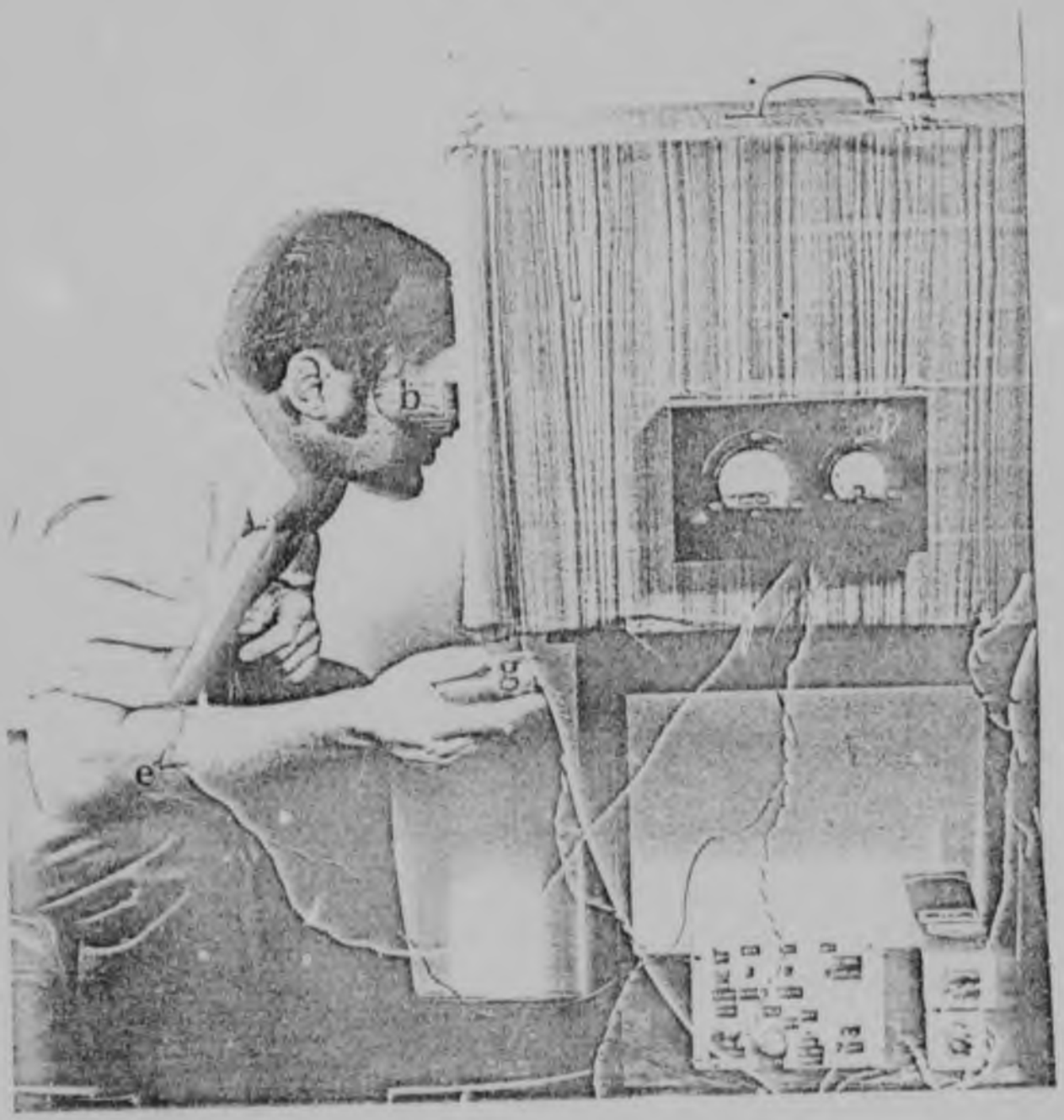



Figure 4. Position of client during conditioning

circuit did not include a high value resistance. The shock source was a transistorised saw-tooth generator with a supply voltage of 18 volts DC, which delivered a variable current at 100 Hz. A half-wave rectifier consisting of a diode in series with the subject was used to reduce the spike effect of the saw tooth wave in order to prevent burning of the skin (Appendix 5). Current intensity was varied by incorporation of a tapped transformer into the circuit which allowed a choice of 4 different voltages to be delivered. In the final stage of voltage generation the tapped transformer

was connected in series with the subject via 4 pole selector switch (Appendix 5).

In order to obtain on indication of the current drawn at the 4 different voltages, the current was calculated using Ohm's law ($R = \frac{E}{I}$). Voltage was read off voltmeter and skin resistance was taken to be 47K ohm, which was found to be the average skin resistance of a wet skin, of number of subjects, as measured by a Yew type 3201 multimeter (DC 100K ohm/V, AC 10K ohm/V). During conditioning voltage supplied was indicated by the voltmeter which was connected in parallel across output leads; whereas current being drawn was shown by the milliameter, which was connected in series with output from generator (Appendix 5). Table 1 presents values for current and voltage for a skin resistance of 47K ohm, at the 4 different shock intensities available from the apparatus.

TABLE 1

VOLTAGES DELIVERED AND CURRENT DRAWN AT RESISTANCE OF 47000 Ohms

| Position | Current | Voltage |
|---|---|---|
| 1 | .06 milliamps | 3 volts |
| 2 | .47 milliamps | 22 volts |
| 3 | 1.32 milliamps | 62 volts |
| 4 | 1.94 milliamps | 82 volts |

Method

This section will first detail the assignment of clients to the various groups and then describe the actual treatment procedures.

There were four homosexual groups, which consisted of a no-contact control group (Group HC); a psychotherapy group (Group HP); a monistic aversion therapy group (Group HMAT) and an holistic aversion therapy group (Group HHAT).

The compulsive clients were divided into three groups; a no-contact control group (Group CC); a psychotherapy group (Group CP); and an aversion therapy group (Group CAT). It may be noted that no attempt was made to match numbers of males and females in the compulsive groups, as no correlation between sex and conditionability has been found (McAllister, 1953).

Assignments of clients (both homosexual and compulsives) to the various groups presented particular difficulties. The research project stretched over a period of three and a half years, the first client was treated during July 1968 and the last during December 1971. Since the clients were referred at a rate of about 4 a month, they were not available all at once. Treatment could obviously not be postponed until the total of 140 clients had been collected. Therefore as the clients became available they were randomly assigned to the various groups. The method used followed the approach advocated by Campbell and Stanley (1963) for forming groups from a sample of potential clients for treatment.

The treatment methods used will now be described separately for the homosexuals and compulsives.

For all homosexuals the first interview (of approximately two hours duration) consisted of case history taking and testing. The case history was directed particularly at establishing the nature and frequency of heterosexual/homosexual behaviour, age of onset of homosexual behaviour and nature of masturbation fantasies. A rating on the KS was obtained and clients filled out the EPI and MS. The writer was present to elucidate difficulties encountered by clients in completing the KS, EPI and MS. Finally, conditioning of the FWR was carried out. The client placed the index finger of his preferred hand on the copper rod after one lead from the power source had been connected to the rod and the other lead to the forearm of the client's preferred arm. The client was told that the experiment was to test his reaction to shock. A bell was sounded for approximately three seconds and immediately afterwards the power source was activated, so that the client received a

shock until he had removed his finger from the copper rod. The procedure was not automated and the bell and shock were separately activated by the writer. After the client had avoided shock on three successive trials, he was given 40 extinction trials. The number of FWR's during the extinction trials was recorded. Conditionability was measured by resistance to extinction of the conditioned FWR as indicated by number of FWR's during the 40 extinction trials. No other procedures were carried out during the first interview, no explanations, interpretations or reassurances were given.

The treatment procedures will now be described separately for the various homosexual groups.

Group HC

After the first interview clients were contacted telephonically and told that treatment could not be undertaken immediately and that they would be contacted again in 3 months time[1]. A few clients (N = 4), presumably the most anxious to overcome their homosexuality, were unwilling to wait the 3 month period and were thus assigned to other groups. No further contact was had with the clients in the control group for three months. At the end of the three month period the clients were again interviewed and rated by the various raters as regards changes in homosexual behaviour. Those clients still desiring treatment were then given treatment.

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1. The conflict between clients' need for alleviation of their symptoms and the writer's need for control groups for homosexuals and compulsives respectively, raised both a practical and an ethical problem. Namely, the right of the writer to exploit the clients by not directly treating, for 3 months, the presenting problems of clients placed in the control groups. The writer therefore felt obliged to inform all clients placed in the control groups that the presenting homosexuality or OCR would not be directly treated for a 3 month period. Clients were then free to choose whether to wait the three month period or not.

Group HP

Clients were seen twice a week.[1] Psychotherapy treatment was based mainly on three aspects.

Firstly, the clients were encouraged to discuss their problems and life in general, the therapist adopting a non-judgemental, accepting and sympathetic attitude. In short, an attempt was made to establish with the clients, a therapeutic relationship of the kind described by Rogers (1961). The aetiology of the homosexual behaviour, family background and family relationships of the client were frequently discussed. Secondly, using Freund's (1960) statement concerning the encouragement of heterosexuality and discouragement of homosexuality, clients were encouraged to mix with and have sexual contact with members of the opposite sex and discouraged from having homosexual contact. Heterosexual behaviour was positively reinforced by the writer praising reports of heterosexual contact. Homosexual contact was negatively reinforced by constant stress to clients that each homosexual encounter strengthened the homosexual habit and was as such a retrograde step. Clients who expressed anxiety about heterosexual relationships were counselled as regards in-vivo techniques to overcome anxiety and impotence in the heterosexual situation, using Masters and Johnson (1970) and Wolpe (1958) as basic source books. Thirdly, clients were encouraged to use heterosexual rather than homosexual masturbation fantasies. In fact, clients were requested to force themselves to think of naked women and heterosexual sex when masturbating. Considerable stress was laid on change of masturbation fantasies.

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1. All clients (both homosexual and compulsive), in the experimental groups, were seen twice a week on Mondays and Thursdays, or on Tuesdays and Fridays, or Wednesdays and Saturdays. Treatment was in all cases continued until 'cure' or termination of treatment by client. But a limit of 4 months was placed on treatment, i.e. approximately 34 sessions.

Group HMAT

All the psychotherapy procedures described above for Group HP were applied to clients in the Group MAT. In addition, an AT session took place at each therapy session. Each AT session consisted of 20 conditioning trials. Trials were limited to 20 per session in order to prevent adaptation to UCS.

Before commencing AT, the procedure to be followed was fully explained to the client, and his shock toleration was measured by gradually subjecting the client to increasing shock intensity (by turning switch h5 through from position 1 to 4). The client was asked to indicate at which point the shock became intolerable. Over 90 per cent of the clients indicated position 2 as the maximum tolerable.

The client was seated in front of the apparatus with his face pressed against viewer and the electrodes attached to his right forearm (Figure 4, page 42). Interior of the apparatus was in complete darkness. The client had been forewarned that on illumination of the interior of the apparatus he would see a homosexual picture and that immediately thereafter he would receive a shock. The pictures consisted of photographs of clothed and unclothed men and/or pictures of men embracing or indulging in mutual masturbation. Whenever possible clients brought for use in AT any arousing homosexual photographs which they had in their possession. Only photographs which the client found arousing were used. Clients were instructed to visualise carrying out their usual homosexual acts with the male shown in the picture, or imagine being involved in any homosexual acts depicted. It was stressed that the client visualize as clearly as possible taking part in homosexual behaviour. During AT the electrodes were always kept wet with a saline solution.

The client was instructed to keep on looking at the picture for as long as he could tolerate the shock. In any event, he was instructed to look at the picture for as long as he was

aroused by it or for as long as he wished to look at it. He was told that he would continue to receive a shock for as long as he was looking at the picture and that he could simultaneously remove both picture and shock by means of the manual control switch, which was held in his left hand. Each picture was used until the client reported that it no longer aroused him, that he found it unattractive or that he was unable to respond to it. Approximately one minute elapsed between each conditioning trial. The shock was always removed simultaneously with offset of CS.

The shock was kept at the level previously ascertained as the maximum tolerable to the client. The yardstick of sufficient intensity of shock was that the shock was sufficiently strong to be tolerable for the client for not more than 30 seconds, at most. If the client was able to tolerate the shock for longer than 30 seconds its intensity was increased. In most instances clients were unable to tolerate the shock for more than a few seconds. But on any 4 of the 20 conditioning trials the intensity of the shock was increased by one position on the control switch (h5), in order to allow for some variation in intensity of UCS. It was felt that the sudden increase in shock intensity might accentuate the aversive effects of the shock by creating uncertainty and maintaining high levels of anxiety in the client. Intensity of CS in relation to environmental stimuli and lack of distraction was ensured by construction of the apparatus, so that when the client had his face pressed against the viewer and the interior of the apparatus was illuminated, he was able to see nothing but the homosexual picture. Shock was delivered automatically approximately 0.5 sec after illumination of the interior of the apparatus. However during each conditioning session the delivery of shock was delayed for 3 seconds, after presentation of CS, on any three conditioning trials and delayed for 8 seconds for any one conditioning trial. In this way some variation in the CS-UCS interval was obtained. One hundred per cent reinforcement was used throughout.

Group HHAT

The same psychotherapy techniques as used for Group HP clients were also used for Group HHAT clients.

Three groups of stimulus conditions were used in the HAT procedure. The first consisted of the same pictorial material as used with Group HMAT clients. Exactly the some procedures as described above for Group HMAT were used. It was postulated that the use of such photographs might establish conditioned aversion to the external cues associated with homosexual behaviour (e.g. certain types of males) as well as to the homosexual behaviour depicted in the photographs or visualized by the client in response to the photographs.

In the second instance, homosexual fantasies and/or usual homosexual masturbation fantasies were used as the CS. The client was asked to fantasize, with his eyes closed, his usual homosexual fantasies and/or homosexual masturbation fantasies. When the client had a clear fantasy he signalled by raising a hand. This served as signal for onset of shock which immediately followed the signal. The client lowered his hand as soon as the fantasy was suppressed by the shock. The shock was terminated, by the writer, as soon as client lowered his hands. If the shock was not sufficiently intense to suppress the fantasy within 30 secs, a stronger intensity was used. One hundred per cent reinforcement was used throughout. The CS-UCS interval and UCS intensity were each varied on any 4 trials in the same manner as described above for the MAT procedure.

Homosexual drive or arousal served as the third CS. The client was asked to imagine the various mental images described in the preceding paragraph or asked to remember his most pleasant homosexual experiences. In addition, he was also given homosexual photographs to peruse. The client then signalled, by raising a hand, when he became excited, aroused, stimulated or felt homosexual desire or any erection response. The raising of the

hand served as a signal for the onset of shock, which was applied until suppression of the arousal, desire, excitement or erection. The client indicated suppression of arousal by lowering his hand.

For all clients in Group HHAT pictorial material was used as the CS in the first AT session, homosexual fantasies in the second session, homosexual arousal in the third session, pictorial material in the fourth session and so on. The use of fantasies and arousal as CS's was continued until the client reported an inability to fantasize or become aroused.

The treatment methods for compulsives will now be described.

For all compulsives the first interview was devoted to case history taking and testing. A comprehensive list was compiled of the kind and frequency of OCR's experienced by the clients. In addition, clients filled out the EPI and MS. A measure of conditionability using the FWR was obtained following the same procedure as described above for the homosexuals. The treatment procedures will be described separately for the three compulsive groups.

Group CC

The need for a no-contact control group for compulsives proved to be a particular problem which was not entirely surmounted. The unpleasantness of the OCR's made the compulsives extremely eager and impatient to commence treatment. Clients tended therefore to resist delay in treatment. In fact, seven clients assigned to the CC group refused to wait 3 months for direct treatment of their respective OCR's and were therefore placed in other groups. It seemed that no contact with clients for 3 months after the first interview, would likely lead to clients discontinuing participation in the treatment program. Accordingly, clients placed in Group CC were seen once fortnightly for a period of three months.

At the fortnightly sessions, of half an hour duration each, the particular OCR's of the client were discussed as little as

possible and if possible not at all. Clients were not given reassurance nor any instructions on how to deal with, suppress or control their respective OCR's. Discussion consisted mainly of further case history taking and the discussion of clients' childhood and their present lives (marriages, jobs, etc.). Group CC was therefore a minimal contact group rather than a no-contact group. At the end of the 3 month period, the clients were rated on the outcome criteria and then treated for their respective OCR's.

Group CP

An attempt was made to establish a warm and supportive therapeutic relationship with the client. The client was encouraged to discuss his particular problems and life in general, within the framework of an accepting and understanding relationship. In particular, clients were reassured that their respective OCR's would disappear in time, that these OCR's were not a sign of mental derangement but merely meaningless worries. Since the OCR's of most clients included ideas of carrying out acts repulsive to the clients, it was of particular importance to reassure clients that such ruminations were not expressions of desire and would never occur. However, there are indications that the constant seeking and obtaining of reassurance by clients, about their respective OCR's, may positively reinforce the OCR's (Rachman, 1971; Rachman, Hodgson and Marks, 1971). Clients frequently sought reassurance that they would not carry out various terrible deeds. It can be argued that the giving of such reassurance and thus temporary relief to the client, is simply positive reinforcement of the expression of the OCR's (Rachman, 1971). Further, it is felt that the constant giving of reassurance to the client keeps him dependent on the therapist and suspends the rational reasoning of the client. Therefore, the writer tended to respond to repetitive requests for reassurance by such statements as 'what do you think?',

'I'd like you to answer your own questions' or 'what do you know to be the truth?'. The interchange would continue until the client was himself able to negate his OCR's and related fears.

Secondly, clients were taught a modified, simple form of progressive relaxation (Jacobson, 1938). Clients were advised to practice the method frequently in order to counter the high levels of anxiety experienced by all the compulsives, especially at times when the OCR's were prominent. It was hoped that dimunition of the anxiety associated with the OCR's would aid in control of the OCR's. Further the anxiety inhibiting effects of the relaxation might serve as an in-vivo form of desensitization of the OCR's (Wolpe, 1958; Mears, 1968; Wolpe and Lazarus, 1966). Practice of relaxation at the time of occurrence of the OCR's could serve as a diversion from the OCR's and possibly as an inhibition of the OCR's.

Thirdly, thought stopping (Wolpe, 1958; Wolpe and Lazarus, 1966) was demonstrated to the clients and advanced as the method to be used to control their OCR's. The method is briefly demonstrated in the following manner, the client is asked to close his eyes and to think the OCR, when the client signals that he is thinking the thought, the therapist loudly bangs the desk and simultaneously shouts 'stop'. Not surprisingly, the client usually reports that the thought is stopped by the sudden onslaught. It is then explained to the client that he can learn to control his thoughts in a similar manner by using the word 'stop' subvocally, whenever the compulsive thought intrudes. The writer (Jacobs, 1967) has used the above method with an additional diversion, which makes the technique 'thought blocking', rather than thought stopping, namely, the client is instructed to think of something else; after saying 'stop'.

Fourthly, logotherapy (Frankl, 1970), was used to counter OCR's. Clients were instructed to reality test and confront their respective OCR's in order to prove to themselves the groundless

nature of the OCR's. Such a step would lead to a loss of apprehension about committing the act visualized in the OCR and enable the client to disregard the OCR. Thus clients whose OCR's centered about 'screaming and behaving in a mad way' in public places were told that when next assailed by the OCR in a public place they should dare themselves to 'scream and behave in a mad way'. Similarly, clients with OCR's of harming others were encouraged to dare themselves to harm others. The logotherapy was continued until the client was able to satisfy himself that he would and could not carry out the OCR's. Further, logotherapy probably serves as a form of in-vivo desensitization and gives the client a feeling of control over the OCR. Since it is in the nature of OCR's to center about ego-alien acts repulsive to the ruminator, and since no psychotics had been included in the study, it was felt that with a reasonable degree of certainty, that the clients would not carry out the contents of their respective OCR's.

Group CAT

The same therapy procedures as detailed above for Group CP were applied to clients in Group CAT, but in addition AT was applied at every treatment session.

Before the AT procedure was carried out the procedure to be followed was explained to the client. Thereafter the shock toleration of the client was measured and the maximum degree of shock intensity tolerable to the client was determined. The AT procedure was carried out as follows. The electrodes of the apparatus were connected to the forearm of the client, who was seated in a comfortable chair with his eyes closed. When the writer said 'begin' the client attempted to bring to mind his usual OCR's. When the client obtained the OCR, he signalled by raising his hand, which served as the signal for onset of shock. Suppression or disappearance of the OCR was signalled by lowering of the hand, which served as signal for immediate termination of

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UCS. At each session 20 conditioning trials were carried out. If intensity of UCS was not sufficient to suppress the OCR within 10 seconds, the intensity of UCS was increased, until it was sufficiently intense to do so. Variation in UCS intensity was achieved by increasing intensity of the shock by one position on the control switch (h5) on any 4 of the conditioning trials. The shock was delayed for 3 seconds on any three trials and for 8 seconds on any one trial.

Outcome criteria and assessment of outcome

Some of the difficulties involved in deriving of adequate outcome measures have been briefly discussed in a preceding section. The concept of target behaviour was used in this research.

Outcome ratings were obtained, wherever possible, from the client, the referring doctor, spouse, family of the client and by the writer.

The client's self-rating involved two procedures, to allow for some cross validation of the rating. The first consisted of asking the client to rate himself. The writer was present at the time of the rating which took place in the writer's consulting rooms. The writer explained in detail what the outcome categories implied. The second procedure consisted of sending the follow-up questionnaire (Appendix 7) to the client within two weeks of the self-rating session. Clients who were slow to send back the follow-up questionnaire were reminded by telephone or by letter. When a discrepancy between the client's two ratings (self-rating and questionnaire rating) existed, the rating of the lower category was taken as the client's self-rating. Thus, if in the first self-rating the client rated himself as greatly improved and on the second cured, the self-rating was taken as greatly improved.

Most clients had post-treatment interviews with the referring medical practitioner, who assessed the clients on the outcome criteria. The assessment of outcome was obtained by a written

report from the doctors, by a perusal of the doctor's file, or in discussion with the doctor.

A rating was also obtained, whenever possible, from the client's spouse or family. Ratings were obtained either by interview or less frequently telephonically or by letter.

Finally, the writer rated the clients. The assessment was based on a detailed questioning of the client.

The various raters, described above, rated clients as no change (NC), slightly improved (SI), greatly improved (GI), or cured (C). Two post-treatment ratings were carried out for clients in both the homosexual and compulsive experimental groups. The first (outcome 1) was within a week of conclusion of treatment and the second (outcome 2) at the follow-up, at least six months after treatment. Control group clients (Groups HC and CC respectively) were assessed three months after the first interview. No follow-ups were available for control groups, as after the 3 month minimal contact period, clients in the control group were given treatment and therefore ceased to serve as no-treatment controls.

Categorization of the clients (homosexuals and compulsives), in terms of the above outcome criteria, was obtained by taking the category of least improvement, amongst all the ratings, as the outcome. Therefore, if the client, the referring doctor and the writer all rated the client as cured and the client's spouse only rated him as slightly improved, he would have been considered only slightly improved. Stringent categorization was felt necessary in view of possible rating bias caused by the client's desire to please the writer. It was constantly stressed to the raters that a frank and accurate rating response was crucial. Finally, effectiveness of the treatment procedures used in this study, was assessed in terms of permanent, marked change wrought in the target behaviour. Permanent, marked change was taken as a rating of cured or greatly improved on outcome 2. Therefore clients falling

into the latter categories on outcome 2 were considered to have responded to treatment, whereas clients falling in to the categories of no change or slightly improved on outcome 2, were considered not to have responded to treatment.

Homosexuals: outcome criteria

Since the purpose of this research was to test the effectiveness of AT in suppressing homosexual behaviour, the assessment of improvement was based mainly on reduction of homosexual behaviour, rather than on heterosexual adaptation. It should be stressed that the writer does not necessarily hold the view that a cure of homosexuality is possible without successful heterosexual adaptation.

The following definitions were adopted for the outcome categories. Cured was defined as a complete cessation of homosexual practice, complete cessation of homosexual desires, complete cessation of the use of homosexual masturbation fantasies and complete cessation of psychic arousal to previously attractive homosexual stimuli. In addition, to be rated as cured the client had to fall into category 0 of the Kinsey scale. However, by exclusively heterosexual was not meant that the client had become a practicing heterosexual, but rather that any sexual thoughts, desire or practice was heterosexually orientated.

Greatly improved was defined as a very marked reduction in the amount and degree of homosexual contact. Clients had to fall into category 1 of the Kinsey scale as regards degree of homosexual behaviour (i.e. only 'incidently homosexual'). For clients to be considered 'greatly improved' an almost total cessation of the previous homosexual practice, desire, fantasies and psychic arousal (to homosexual stimuli) was required. If the client did not show marked reduction in all four of the above aspects he was not rated as greatly improved. Thus if there was a total disappearance or marked reduction in homosexual practice, desire and arousal, but lack of reduction in homosexual fantasies, the client was not rated as greatly improved.

Slightly improved was defined to include all clients who showed some reduction of homosexual fantasies, arousal, desire or practice. Clients whose post-treatment Kinsey ratings were lower than their pre-treatment Kinsey ratings were also considered slightly improved.

Finally, no change was defined as no reduction in homosexual behaviour or an increase in homosexual behaviour, clients whose pre- and post-treatment Kinsey ratings remained the same.

Three separate Kinsey ratings were obtained for the homosexuals in the experimental groups. The first (Kinsey 1) was carried out at the time of the first pre-treatment interview, the second (Kinsey 2) at the time of the post-treatment interview, within a week of termination of treatment and the third (Kinsey 3) was carried out at the time of follow-up.

Compulsives: outcome criteria

Cured was defined as a complete disappearance of the presenting or related OCR's. Since OCR's tend to be all pervasive it was felt that cure should also lead to enhanced effectiveness in living. Knight's (1941) criteria served as a guide in assessing enhanced effectiveness in living. The criteria being, symptomatic improvement, increased productiveness at work, improved adjustment and pleasure in sex, improved interpersonal relationships and enhanced ability to handle ordinary psychological conflicts and reasonable reality stress.

Greatly improved was defined as a very marked reduction in the frequency and intensity of the OCR's, at least to the extent that the client no longer considered the OCR's a major problem. To fall into the category of greatly improved, it was necessary that the remaining OCR's did not materially effect the client's daily living, his ability to work or interpersonal relationships.

Slightly improved was defined as some reduction in the frequency or intensity of the compulsive ruminations but not

sufficient for the client to be rated as greatly improved. An enhanced ability to cope with work, interpersonal relationships and life in general had to accompany the reduction in the frequency and intensity of OCR's, before client was rated as slightly improved.

Finally, no change was defined as no reduction in frequency and intensity of, or exacerbation of the OCR's, or some reduction in frequency or intensity of the presenting OCR, but not sufficient to allow the client to cope more easily with living, work and interpersonal relationships in general.

# RESULTS

Results will be given separately for homosexuals and compu'sives under the headings of composition of groups, outcome of treatment and duration of treatment.

## Homosexuals: composition of groups

In spite of the fact that clients were randomly assigned to the various subgroups, the groups emerged as closely matched on the major variables. In particular, the groups were closely matched on N and E scores on the EPI (Table 2), Kinsey 1 ratings (Table 3), conditionability as measured by mean number of conditioned FWR's on extinction trials (Table 4), motivation ratings on MS (Table 5), mean age of clients (Table 6), distribution of primary and secondary homosexuals (Table 7), mean duration of the homosexual behaviour of the clients (Table 8) and finally in respect of clients' reasons for appearing for treatment (Table 9).

The mean position of the homosexuals along the continuum of the Kinsey scale fell between 'predominantly homosexual but more than incidently heterosexual' (rating 4) and 'predominantly homosexual but incidently heterosexual' (rating 5) (Table 3). Although the homosexual groups were closely matched in terms of mean Kinsey ratings, the distribution of Kinsey categories varied from group to group (Table 3). The control group contained relatively more bisexuals (Kinsey rating 3) and fewer completely homosexual clients (Kinsey rating 6) than the experimental groups, but the difference was not statistically significant ($\chi^2 = 2.6$, $df = 1, p < .20$).

TABLE 2

MEAN NEUROTICISM (N) AND EXTRAVERSION (E) SCORES FOR HOMOSEXUALS

| | Group | | | |
|---|---|---|---|---|
| | HC | HP | HMAT | HHAT |
| Mean N Score | 26 | 25 | 29 | 27 |
| SD | 11 | 10 | 8 | 12 |
| Mean E Score | 20 | 19 | 22 | 22 |
| SD | 9 | 7 | 9 | 8 |

TABLE 3

DISTRIBUTION OF HOMOSEXUALS IN THE VARIOUS GROUPS ACCORDING TO KINSEY 1 RATINGS

| | No. in each group | | | | |
|---|---|---|---|---|---|
| Kinsey Rating | HC | HP | HMAT | HHAT | Total |
| 6 | 2 | 6 | 5 | 4 | 17 |
| 5 | 4 | 4 | 6 | 5 | 19 |
| 4 | 7 | 6 | 7 | 8 | 28 |
| 3 | 6 | 3 | 1 | 2 | 12 |
| 2 | 1 | 1 | 1 | 1 | 4 |
| 1 | - | - | - | - | - |
| 0 | - | - | - | - | - |
| Total | 20 | 20 | 20 | 20 | 80 |
| Mean Kinsey Rating | 4.0 | 4.6 | 4.7 | 4.4 | 4.4 |
| SD | 1.1 | 1.3 | 1.4 | 1.0 | 1.2 |

TABLE 4

HOMOSEXUAL GROUPS AND CONDITIONABILITY

| | Group | | | |
|---|---|---|---|---|
| | HC | HP | HMAT | HHAT |
| Mean No. of FWR's | 33 | 35 | 36 | 33 |
| SD | 11 | 6 | 7 | 13 |

TABLE 5

MEAN MOTIVATION SCORES IN THE HOMOSEXUAL GROUPS

| | Group | | | |
|---|---|---|---|---|
| | HC | HP | HMAT | HHAT |
| Mean motivation score | 3.2 | 4.0 | 4.0 | 4.0 |
| SD | 1.5 | 2.0 | 1.0 | 1.0 |

TABLE 6

MEAN AGE IN HOMOSEXUAL GROUPS

| | Group | | | |
|---|---|---|---|---|
| | HC | HP | HMAT | HHAT |
| Mean Age | 30 | 29 | 30 | 27 |
| SD | 9 | 7 | 10 | 7 |

TABLE 7

DISTRIBUTION OF PRIMARY AND SECONDARY HOMOSEXUALS IN THE HOMOSEXUAL GROUPS

| | Group | | | |
|---|---|---|---|---|
| Type | HC | HP | HMAT | HHAT |
| Primary | 8 | 9 | 8 | 8 |
| Secondary | 12 | 11 | 12 | 12 |
| Totals | 20 | 20 | 20 | 20 |

TABLE 8

MEAN DURATION (IN YEARS) OF HOMOSEXUAL BEHAVIOUR IN THE VARIOUS GROUPS

| | Group | | | |
|---|---|---|---|---|
| | HC | HP | HMAT | HHAT |
| Mean Duration | 8.9 | 10.6 | 10.0 | 8.0 |
| SD | 5.0 | 6.3 | 4.2 | 4.9 |

TABLE 9

HOMOSEXUAL GROUPS AND CLIENTS' REASONS FOR APPEARING FOR TREATMENT

| | Group | | | |
|---|---|---|---|---|
| Reason | HC | HP | HMAT | HHAT |
| Own Accord | 9 | 8 | 8 | 10 |
| Pressure by family or doctor | 6 | 6 | 7 | 5 |
| Court or police | 4 | 3 | 3 | 2 |
| Referred for other problems | 0 | 2 | 1 | 1 |
| Unrequited love | 1 | 1 | 1 | 2 |
| Totals | 20 | 20 | 20 | 20 |

Homosexuals: outcome of treatment

Before giving the outcome of treatment the sources of outcome ratings will be detailed (Table 10). It can be seen that not all clients were rated by all four separate raters, but there were at least two independent ratings for each client. Approximately 11 per cent (outcome 1) and 15 per cent (outcome 2) of the homosexuals failed to respond altogether to the follow-up questionnaire. But, in no case was the writer unable to finally obtain a self-assessment from the client, either through interviews, telephonically or by letter.

TABLE 10

SOURCES OF OUTCOME RATINGS

| Rating by | Outcome 1 | Outcome 2 |
|---|---|---|
| client (C), writer (W) | 9 | 15 |
| C, W, doctor (D) | 53 | 47 |
| C, W, D, spouse (S) | 1 | 3 |
| C, W, S | 17 | 15 |
| Total | 80 | 80 |

The various homosexual groups differed significantly when outcomes 1 and 2 were treated as a main effect ($F = 12.08$, $df = 3/76$, $p < .001$) (1)[1]. Table 11 details outcome of treatment and indicates that Group HHAT responded best to treatment.

TABLE 11

OUTCOME OF TREATMENT

| Group | N | Outcome 1 NC | SI | GI | C | Outcome 2 NC | SI | GI | C |
|---|---|---|---|---|---|---|---|---|---|
| HC | 20 | 17 | 2 | - | 1 | 17 | 2 | - | 1 |
| HP | 20 | 10 | 5 | 3 | 2 | 13 | 3 | 2 | 2 |
| HMAT | 20 | 4 | 5 | 5 | 6 | 9 | 5 | 3 | 3 |
| HHAT | 20 | 2 | 2 | 7 | 9 | 4 | 3 | 4 | 9 |
| Total | 80 | 33 | 14 | 15 | 18 | 43 | 13 | 9 | 15 |

In order to further test inter-group differences with respect to outcome, the various groups were compared using the $\chi^2$ test

1. Analysis of variance source Tables are presented in Appendix 6. Number in parenthesis refers to Source Table. Analysis of variance was based on a mixed design (Myers, 1966).

(Table 12). For the above purpose 2 X 2 contingency tables were drawn up by grouping together 'no change' and 'slight improvement' as one category (i.e. not responded) and 'greatly improved' and 'cured' as another category (i.e. responded). The results confirmed that Group HHAT responded best to treatment (see Table 12). Significant inter-group differences were revealed between Group HHAT and Groups HC and HP on both outcomes 1 and 2, and between Groups HHAT and HMAT on outcome 2 (Table 12). On the other hand, although group HMAT differed significantly from Group HC on both outcomes 1 and 2, Group HMAT did not differ significantly from Group HP on either outcomes 1 or 2 (Table 12). Finally, Groups HC and HP did not differ significantly on either outcomes 1 or 2 (Table 12).

TABLE 12

ANALYSIS BY $X^2$ OF INTER-GROUP DIFFERENCES ON OUTCOME RATINGS

| Source | Outcome 1 $X^2$ | df | P | Outcome 2 $X^2$ | df | P |
|---|---|---|---|---|---|---|
| HHAT vs HC | 23.01 | 1 | $<.001$ | 15.82 | 1 | $<.001$ |
| HHAT vs HP | 12.13 | 1 | $<.001$ | 8.28 | 1 | $<.01$ |
| HHAT vs HMAT | 2.84 | 1 | - | 4.91 | 1 | $<.05$ |
| HMAT vs HC | 11.90 | 1 | $<.001$ | 4.32 | 1 | $<.05$ |
| HMAT vs HP | 3.75 | 1 | - | 0.53 | 1 | - |
| HP vs HC | 1.64 | 1 | - | 0.91 | 1 | - |

The significant group differences with respect to outcome were further demonstrated by significant group differences on the combined Kinsey 1, 2 and 3 ratings ($F = 6.40$, $df = 3/76$, $p.<005$) (2). Table 13 shows that Group HHAT responded best to treatment in terms of greatest mean reduction in rating, from Kinsey 1 to Kinsey 3 respectively.

TABLE 13

MEAN KINSEY 1, KINSEY 2 AND KINSEY 3 RATINGS FOR HOMOSEXUALS

| Group | N | Kinsey 1 | SD | Kinsey 2 | SD | Kinsey 3 | SD |
|---|---|---|---|---|---|---|---|
| HC | 20 | 4.0 | 1.1 | 3.8 | 0.9 | 3.8 | 0.9 |
| HP | 20 | 4.6 | 1.3 | 3.7 | 1.6 | 4.0 | 1.7 |
| HMAT | 20 | 4.7 | 1.4 | 2.7 | 1.3 | 3.5 | 1.4 |
| HHAT | 20 | 4.4 | 1.0 | 1.7 | 1.3 | 2.1 | 1.8 |

The differential group effect, with respect to outcome, was also brought out by the relapse data, i.e. by the comparison of outcome 1 and outcome 2 as well as Kinsey 2 and Kinsey 3 ratings. Although all the homosexual groups manifested a significant relapse rate both in terms of outcome ratings ($F = 20.13$, $df = 1/76$, $p < .001$(1) and Kinsey ratings ($F = 65.50$, $df = 2/152$, $p < .001$) (2), the rate of relapse differed significantly between the various groups, as shown by a significant Groups X Outcome interaction ($F = 4.94$, $df = 3/76$, $p < .05$)(1) and by a significant Groups X Kinsey interaction ($F = 9.8$, $df = 6/152$, $p < .01$)(2). Figures 5 and 6 clearly illustrate that of the homosexual groups, Group HHAT both responded best to treatment and maintained improv st.

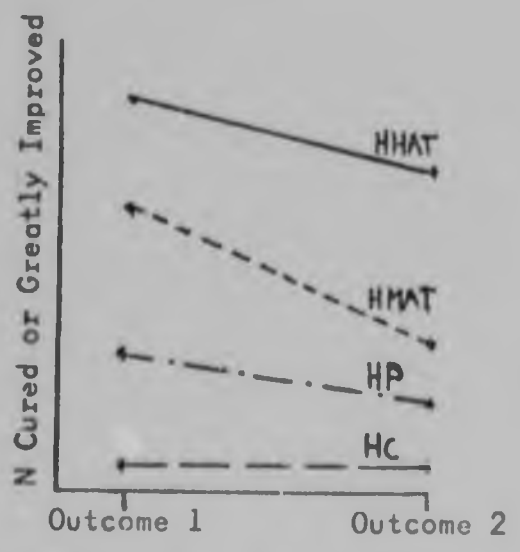



Figure 5. Outcome Ratings

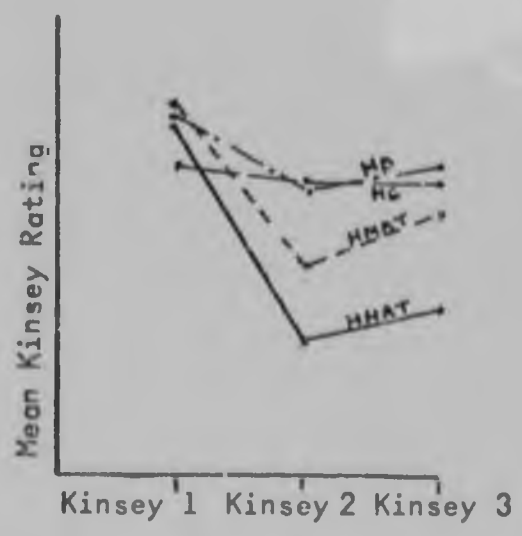



Figure 6. Kinsey Ratings

Further, as regards outcome of treatment, an attempt was made to classify clients' subjective evaluations of the effects of treatment. In particular, it was attempted to ascertain whether treatment resulted in increased heterosexual desire, decreased homosexual drive, suppression of homosexual fantasies or conditioned anxiety toward homosexual behaviour. Accordingly, clients rated as cured or greatly improved in outcome 1 were asked to subjectively evaluate the effects of treatment (Table 14). It may be noted that drive suppression (DS) means loss of desire for and interest in homosexual behaviour, fantasy suppression (FS) the absence of homosexual masturbation and other fantasies, fear (F) refers to conditioned anxiety towards homosexual activities and increased heterosexuality (IH) refers to increased attraction to females or increased heterosexual sexual fantasies. The primary effect of both AT and psychotherapy was to suppress homosexual drive, i.e. to cause a loss of interest in homosexual activities (Table 14). The use of AT also led to suppression of homosexual fantasy, but AT and psychotherapy were relatively ineffective in establishing heterosexual behaviour or increasing heterosexual drive (Table 14). In not a single case was increased heterosexuality the sole effect of treatment, but always accompanied suppression of homosexual drive. Neither AT nor psychotherapy tended to cause the development of fear or anxiety towards homosexual behaviour.

TABLE 14

CLIENTS' SUBJECTIVE EVALUATION OF THE EFFECTS OF TREATMENT

| | | Effects of treatment | | | | | |
|---|---|---|---|---|---|---|---|
| Group | N | No change | DS | FS | DS & FS | F | IH |
| HP | 20 | 15 | 4 | - | 1 | - | 3 |
| HMAT | 20 | 9 | 3 | 2 | 5 | 1 | 4 |
| HHAT | 20 | 4 | 6 | 1 | 9 | - | 3 |
| Total | 60 | 28 | 13 | 3 | 15 | 1 | 10 |

Finally, the contingency coefficient was used to measure degree of relationship between various variables and outcome 2, for the combined sample of the 3 experimental groups (N = 60). No significant relationship was found between outcome 2 and the variables of age, conditionability, N and E scores, duration of homosexuality, MS scores, primary/secondary classification, previous exposure to therapy and reasons for appearing for treatment. However, a significant negative correlation between Kinsey 1 rating and outcome 2 was revealed ($C = 0.4$, $df = 2$, $p < .05$).

Homosexuals: duration of treatment

Treatment for the experimental groups was relatively rapid and of short duration (Table 15). The experimental groups differed in regard to mean number of treatment sessions (Table 15) although these differences were not statistically significant when the groups were compared by $X^2$. Table 15 also gives mean number of sessions for clients responding and not responding to treatment respectively. $X^2$ did not reveal that the differences between the former and the latter categories were significant. It may be noted that the mean number of sessions for each group, do not reflect the average number of sessions of clients responding and not responding to treatment, as numbers of clients in the former and latter categories were not equal.

TABLE 15

DURATION OF TREATMENT

| Group | Mean number of sessions | | | |
|---|---|---|---|---|
| | Mean | SD | Not Responding | Responding |
| HP | 5.0 | 1.0 | 5 | 6 |
| HMAT | 10.0 | 8.7 | 10 | 8 |
| HHAT | 8.2 | 4.2 | 7 | 9 |

A considerable number of clients discontinued treatment (Table 16), i.e. withdrew from treatment before completion of treatment or who withdrew from treatment after three or less treatment sessions in spite of not being rated as cured or greatly improved. Clients who discontinued treatment were rated as no change or slightly improved. Ostensible reasons for discontinuing treatment included fear of shock and dislike of treatment (N = 5), lack of motivation to change homosexual orientation (N = 6) and lack of faith in treatment or therapist (N = 5). It should be noted that at the end of the three month no-contact period, 8 clients in the control group had decided not to undergo treatment. Two stated that they wished to try to overcome their problems on their own, whilst 6 had lost interest in change.

TABLE 16

HOMOSEXUALS DISCONTINUING TREATMENT

| Group | | | |
|---|---|---|---|
| HC | HP | HMAT | HHAT |
| 8 | 6 | 6 | 4 |

Finally, mean lengths of follow-up for the experimental groups were calculated from termination of treatment to time of assessment of outcome (Table 17). There was a wide range in length of follow-ups (6 to 28 months), as the study was spread over a period of 3½ years.

TABLE 17

MEAN LENGTH OF FOLLOW UP IN MONTHS

| Group | Mean | SD |
|---|---|---|
| HP | 13 | 10 |
| HMAT | 18 | 17 |
| HHAT | 16 | 13 |

Compulsives: composition of groups

The compulsive groups emerged as closely matched on N and E scores (Table 18), conditionability (Table 19), MS scores (Table 20) age (Table [illegible] distribution of the various kinds of OCR (Table 22), ar[illegible]on of the OCR'S (Table 23).

TABLE 18

MEAN NEUROTICISM (N) AND EXTRAVERSION (E) SCORES FOR COMPULSIVES

| | Group | | |
|---|---|---|---|
| EPI | CC | CP | CAT |
| Mean N Score | 36 | 39 | 34 |
| SD | 9 | 6 | 8 |
| Mean E Score | 16 | 17 | 14 |
| SD | 9 | 7 | 8 |

TABLE 19

COMPULSIVE GROUPS AND CONDITIONABILITY

| | Group | | |
|---|---|---|---|
| | CC | CP | CAT |
| Mean N FWR's | 30 | 35 | 33 |
| SD | 6 | 8 | 5 |

TABLE 20

MEAN MOTIVATION SCORES IN COMPULSIVE GROUPS

| | Group CC | CP | CAT |
|---|---|---|---|
| Mean Motivation Score | 4.6 | 4.7 | 4.8 |
| SD | 0.7 | 0.5 | 0.4 |

TABLE 21

MEAN AGE IN COMPULSIVE GROUPS

| | Group CC | CP | CAT |
|---|---|---|---|
| Mean Age | 28 | 30 | 27 |
| SD | 9 | 8 | 6 |

TABLE 22

COMPULSIVE GROUPS AND DISTRIBUTION OF OCR'S

| Kind of OCR | Group CC | CP | CAT |
|---|---|---|---|
| Harming self | 3 | 2 | 2 |
| Harming others | 3 | 4 | 3 |
| Hypochondriacal | 4 | 5 | 4 |
| Sexual | 4 | 2 | 5 |
| Public embarrassment | 2 | 3 | 2 |
| Ritualistic | 4 | 4 | 4 |
| Totals | 20 | 20 | 20 |

TABLE 23

MEAN DURATION (IN YEARS) OF COMPULSIVE BEHAVIOUR IN THE COMPULSIVE GROUPS

| | Group CC | CP | CAT |
|---|---|---|---|
| Mean duration | 5.0 | 4.5 | 4.6 |
| SD | 3.6 | 2.0 | 3.2 |

Compulsives: outcome of treatment

The sources of outcome ratings for the compulsives are detailed in Table 24. There were at least 2 independent ratings for each client (Table 24). Although approximately 9 per cent (outcome 1) and 12 per cent (outcome 2) of clients did not send back the follow-up questionnaire, a self-rating was, in every case, obtained by interview, telephonically or by letter.

TABLE 24

SOURCES OF OUTCOME RATINGS

| Rating by | Outcome 1 | Outcome 2 |
|---|---|---|
| client (C), writer | 2 | 3 |
| C, W, doctor (D) | 4 | 5 |
| C, W, D, spouse (S) | - | 4 |
| C, W, S | 54 | 48 |
| Total | 60 | 60 |

The compulsive groups differed significantly in respect of combined outcome 1 and 2 ratings ($F = 23.68$, $df = 2/57$, $p < .001$) (3). However, no differential relapse rate was evident between the groups ($F = 1.64$, $df = 2/57$)(3), although the compulsive group as a whole showed a significant rate of relapse ($F = 18.97$,

df = 1/57, p $<$.001) (3). Table 25 details outcome of treatment in terms of outcome ratings and shows that both groups CP and CAT responded better to treatment than Group CC.

TABLE 25

RESPONSE TO TREATMENT

| Group | N | Outcome 1 NC | SI | GI | C | Outcome 2 NC | SI | GI | C |
|---|---|---|---|---|---|---|---|---|---|
| CC | 20 | 16 | 1 | 3 | - | 18 | 1 | 1 | - |
| CP | 20 | 2 | 2 | 11 | 5 | 5 | 6 | 6 | 3 |
| CAT | 20 | - | 4 | 12 | 4 | 6 | 2 | 8 | 4 |
| Total | 60 | 18 | 7 | 26 | 9 | 29 | 9 | 15 | 7 |

In order to further analyse inter-group differences, with respect to outcome, the $X^2$ test was used and 2 X 2 contingency tables drawn up, by grouping 'no change' and 'slightly improved' as one category (i.e. not responded) and 'greatly improved' and 'cured' (i.e. responded) as the other category. Although both Groups CP and CAT responded significantly better to treatment than Group CC, Groups CP and CAT did not differ significantly on either outcome 1 or 2 (Table 26).

TABLE 26

ANALYSIS BY $X^2$ OF INTER-GROUP DIFFERENCES ON OUTCOME

| Source | Outcome 1 $X^2$ | df | p | Outcome 2 $X^2$ | df | p |
|---|---|---|---|---|---|---|
| CAT vs CP | 0.00 | 1 | - | 0.90 | 1 | - |
| CAT vs CC | 16.94 | 1 | $<$.001 | 13.97 | 1 | $<$.001 |
| CP vs CC | 16.94 | 1 | $<$.001 | 8.53 | 1 | $<$.01 |

Lastly, the contingency coefficient did not reveal significant relationships between outcome 2 and the variables of age, duration of OCR, N and E scores, conditionability, motivation, type of OCR and previous exposure to therapy.

Compulsives: duration of treatment

Treatment for both the CP and CAT groups was of relatively short duration (Table 27). Clients responding to treatment (rated as cured or greatly improved on follow-up) had fewer treatment sessions than clients not responding to treatment (rated as no change or slightly improved on follow-up) (Table 27). However the difference was not shown by $X^2$ to be significant.

TABLE 27

MEAN NUMBER OF SESSIONS FOR COMPULSIVES

| Group | Mean | SD | Mean number of sessions Responding | Not Responding |
|---|---|---|---|---|
| CP | 9.0 | 4.0 | 6 | 12 |
| CAT | 7.0 | 3.0 | 5 | 9 |

Further, in regard to duration of treatment it may be noted that only a small percentage of compulsives discontinued treatment (Table 28). Clients who discontinued treatment were rated as 'no change' or 'slightly improved'. Ostensible reasons for discontinuing treatment, for clients in the experimental groups, were onset of severe depressive illness (N = 2) and psychotic breakdown (N = 1). Of the clients in the control group, one terminated participation in the program 2 weeks after the first interview, three clients discontinued 4 weeks after the first interview, and two clients discontinued approximately 10 weeks after the first interview. The remaining fourteen clients in the control group kept coming to see the writer for the 3 month period.

TABLE 28

COMPULSIVES DISCONTINUING TREATMENT

| | Group | | |
|---|---|---|---|
| | CC | CP | CAT |
| N | 6(30%) | 1(5%) | 2(10%) |

Finally, in regard to duration of treatment, Table 29 gives length of follow-ups, in months, for the experimental groups, i.e. the interval from termination of treatment to the assessment of outcome 2. Due to the spread of the research project over a period of 3½ years there was a wide range in length of follow-ups (6 to 28 months).

TABLE 29

LENGTH OF FOLLOW-UP

| | | Follow-up | |
|---|---|---|---|
| Group | N | Mean | SD |
| CP | 20 | 14 | 12 |
| CAT | 20 | 15 | 12 |
| Total | 40 | 29 | 24 |

# DISCUSSION

The results will be discussed under the headings of composition of groups, homosexuals: outcome of treatment, compulsives: outcome of treatment, heterosexual adaptation and the treatment of homosexuality, variables affecting the treatment of homosexuality and OCR's and finally, learning theory and AT.

## Composition of groups

The fact that the various homosexual and compulsive subgroups respectively, emerged as closely matched on major variables, in spite of random allocation of the clients to the various groups, attests to the homogeneity of the client sample. The majority of the clients had voluntarily sought and persevered with treatment of their respective problems. Therefore, it should be expected that the clients, as a whole, would tend to be highly motivated. It is also possible that the groups were sufficiently large in number (N = 20) to make for similarity of distribution of the major variables.

A factor making for even distribution of Kinsey Scale ratings amongst homosexuals, was that the Kinsey Scale, being only a 7 point scale, does not allow for wide variation on score. Similarly, the motivation scale, did not allow for wide variation in motivation scores.

It was noted that the homosexual control group contained relatively fewer completely homosexuals and more bisexuals than the experimental homosexual groups. An explanation is that four clients with high pretreatment Kinsey ratings, originally assigned to Group HC, were reluctant to delay treatment and had to be transferred to the experimental groups. On the other hand, none of the bisexuals assigned to the control group, refused to delay treatment and thus remained in Group HC. The four clients who

refused to delay treatment were highly motivated and their exclusion from the control group probably accounts for the lower mean motivation score for the control group (Table 5).

It has been postulated that obsessive reactions, such as OCR's, are symptomatic of the 'dysthymic' personality, characteristic of which are high N and low E test scores (Eysenck, 1957). It could then be expected that the compulsives, being dysthymics, would be closely matched as regards N and E scores. Finally, it was seen that the compulsives were on the whole more neurotic and less extravert than the homosexuals (Tables 3 and 18). The differences were probably due to the fact that the OCR's were accompanied by high levels of anxiety, self-preoccupation, depression and social withdrawal, all of which could be expected to lead to high neuroticism and low extraversion scores.

Homosexuals: outcome of treatment

The response to treatment of clients treated by HAT (65 per cent cured or greatly improved on outcome 2) compares most favourably with results obtained in other reports on the treatment of homosexuality. In a major study Feldman and MacCulloch (1971), using AAC, reported a 58 per cent improved rate in a sample of 43 homosexuals. However, their improved clients received an average of 18-20 treatments of approximately 25 trials each, whereas, the cured or improved Group HHAT clients, in the present survey, received approximately 9 treatments of 20 trials each (Table 14). Furthermore, more stringent outcome criteria appear to have been used in the present survey than used by Feldman and MacCulloch. Thus, Feldman and MacCulloch included two clients with Kinsey ratings of 2 as improved, whereas only clients with Kinsey ratings of 0 or 1 were considered cured or greatly improved in the present study. However, the Group HHAT sample, in this study, had a lower mean pre-treatment Kinsey rating than Feldman and MacCulloch's sample (4.4 as compared to 5.0), which may

partially account for the better results achieved in the present instance. It may be noted that some writers have stressed the basic similarity of avoidance conditioning and RCAS (Kanfer and Phillips, 1970; Solomon, 1964). In terms of such similarity it is hardly surprising that results obtained in this study using HAT were not very markedly different from those obtained by Feldman and MacCulloch (1971). It is submitted that the superior results obtained by HAT can be explained in terms of deficiencies in the AAC method, already discussed, and in particular in terms of the fact that HAT was directed at suppressing homosexual drive.

Comparing the results of holistic and monistic aversion therapy respectively, the greater effectiveness of HAT seems due to a number of factors. Firstly, HAT was a more complete treatment than MAT. Alternatively, MAT can be considered an incomplete treatment. HAT was an attempt to deal with intervening, motivating, mediating and intrinsic variables in addition to extrinsic, peripheral or behaviour variables. MAT was more typically 'behaviouristic' than HAT. The present results tend to substantiate the viewpoint that complete behaviour therapy requires treatment of drive underlying behaviour in addition to treatment of the behaviour itself (Eysenck, 1960; Jacobs, 1972; Lazarus, 1965, 1971).

Secondly, there is evidence that conditioning involving interoceptive, visceral or physiological stimuli is more resistant to extinction than conditioning involving exteroceptive, perceptual, conscious stimuli (Grings, 1965; Rachman and Teasdale, 1969a, Razran, 1955). HAT involved more interoceptive stimuli, in the form of arousal, than did MAT, and did resist extinction better than MAT.

Thirdly, it has been shown that extinction of a CR is slower when a pattern of stimuli rather than a single simple stimulus (a single aspect of the pattern) is used in conditioning (Razran, 1939). The stimuli used in HAT were more interrelated than those

used in MAT. Thus in the case of HAT, both fantasies and sexual arousal caused by the homosexual pictures served as CS's.

Fourthly, the suppression of homosexual masturbation fantasy may be the most direct method of suppressing homosexuality (Barlow, 1973; Evans, 1968; Jackson, 1969). More emphasis was given to the punishment of homosexual masturbation fantasies in the HAT procedure than in the MAT procedure. The above probably also accounts for the greater effectiveness of HAT.

Fifthly, differences in methodology between the HAT and MAT procedures may account for the greater effectiveness of HAT. Both MAT and HAT involved classical conditioning (repeated pairings of pictorial material with shock regardless of client's response) and RCAS (shock contingent upon client's arousal or fantasy response). However, MAT involved less RCAS conditioning than HAT, or MAT consisted largely of classical CS-UCS pairing irrespective of response of client. As already mentioned there are indications that RCAS may be the most effective paradigm on which to base AT.

Sixthly, the use of imaginal stimuli in AT leads to conditioning particularly resistant to extinction (Rachman and Teasdale, 1969a). HAT involved more imagined stimuli than MAT. It has already been noted that erotic imaginal fantasies appear to be more effective than static pictures in producing sexual arousal. However, the majority of studies concerning the treatment of homosexuality by AT, have used static pictorial material rather than imaginal stimuli (Rachman and Teasdale, 1969b). The present findings suggest that in addition to static pictures, arousal and fantasies should be used as a pattern of related CS's in carrying out AT. Recent research has shown that a movie featuring nudes is more sexually arousing than still pictures of nudes (Freund, Langevin and Zajac, 1974). However, movies do not appear to have been exploited for use in AT.

Finally, it is probable that punishment of actual consummatory behaviour is more effective in suppressing that behaviour than punishment contingent upon stimuli associated with the behaviour (Lichtenstein, 1950). It will be recalled that dogs shocked on the presentation of food did not develop inhibition of eating, whereas dogs shocked as soon as they began to eat did develop inhibition of eating. HAT involved punishment of actual arousal and of usual homosexual fantasies and was therefore more directed at consummatory behaviour than the MAT procedure. It follows that AT would be most effective if the noxious UCS could be applied at the time the homosexual actually carries out homosexual acts. The most feasible method of achieving such punishment of homosexual behaviour would appear to be the use of aversive images. Thus a homosexual may be instructed to think disgusting, sickening or revolting thoughts or images while actually engaged in homosexual behaviour. This approach, it is suggested, offers a worthwhile avenue for further research. In the present study, homosexuals were instructed to desist from homosexual behaviour during the course of treatment so that the possibilities of aversive images during actual homosexual contact, were not explored.

Group HMAT did not differ significantly from Group HP on outcome and the mean number of treatment sessions for the HP group was 5.0 as compared to 10.0 for the MAT group. Therefore it hardly appears justifiable to subject clients to the rigours of AT, when results almost as satisfactory were obtained with less time, effort and discomfort using psychotherapy techniques.

It is likely that the psychotherapy techniques used in this study, would have been considerably more effective had they been combined with covert sensitization or aversive images of the kind used by Cautela and Wisocki (1969). In view of the lack of significantly greater effectiveness of MAT over psychotherapy on Outcome 2 it seems that the major determinants of permanent change

in homosexual orientation for Group HMAT were the psychotherapeutic techniques used rather than the AT. The results for Groups HP and HMAT also bear out Freund's (1960) contention that the major determinant in the successful treatment of homosexuality is simply the discouragement of homosexuality and the encouragement of heterosexuality. It was shown that psychotherapy involved fewer treatment sessions than both forms of AT used in this study. The most ready explanation would appear to be that clients undergoing psychotherapy relied more on self-help than clients undergoing AT. Thus, after a few sessions, Group HP clients tended to feel that they knew what they had to do, i.e. basically suppress homosexual fantasies and contacts and make heterosexual contact, and tended to 'try on their own'.

There has been a recent trend in behaviour therapy to de-emphasize the role of AT and to emphasize the role of heterosexual adaptation, in treating homosexuality (Barlow, 1973; Davison and Wilson, 1973; Lazarus, 1971; Wilson and Davison, 1974). Wilson and Davison, in fact, suggest that the effective factor in the treatment of homosexuality, even when AT is used, is usually the increase in heterosexual arousal rather than the elimination of homosexual arousal. The finding that MAT was not significantly more effective than psychotherapy, in the present study, lends support to this trend. It has also been shown that where heterosexual responses have been increased, without use of AT or other methods to suppress homosexual drive, the homosexual drive diminished anyway (Barlow, 1973). Yet behaviour therapists have mainly relied on AT to eliminate homosexual behaviour and have tended to give insufficient attention to the fostering of heterosexual behaviour (Davison and Wilson, 1973). Davison and Wilson commented that 'attempts have usually been made to change homosexual orientation with undue and probably unjustifiable reliance on aversion therapy'.

As regards relapse, it has already been noted that a high relapse rate after 'successful' AT has been encountered (Rachman and Teasdale, 1969a). Booster AT sessions, after completion of AT, have been suggested as an effective method of reducing relapse rate (Eysenck and Rachman, 1965; Rachman and Teasdale, 1969a). The lack of booster treatment sessions in the present study may therefore account for some of the relapses encountered. It is also feasible that the unpleasantness of the AT treatments encouraged clients to terminate treatment as rapidly as possible, resulting in under-learning.

A possible cause of relapse for subjects treated by AT may have been insufficient shock intensity. It is possible that some clients, fearing shock, may have chosen a shock load not sufficiently intense (Tanner, 1973). It is further speculated that the high relapse rate for Group HMAT may be understood in relation to the work of Quinn and Henbest (1967). Alcoholics in whom an aversion was conditioned to whisky, tended after treatment to continue drinking forms of alcohol other than whisky. The actual desire to drink seems not to have been eliminated. Similarly, for Group HMAT clients, relapse would be most likely if the underlying homosexual drive remained even though peripheral forms of homosexual behaviour may have been suppressed.

Eysenck (1963) postulated that the kind of conditions usually treated by AT involve parasympathetic functioning in which the neurotic behaviour is followed by immediate reward. The AT procedure attempts to remove reward following the behaviour by replacing arousal by punishment. But, since AT does not usually involve overlearning, the balance between the response strengths of the normal and abnormal behaviours will be finely balanced (Eysenck, 1963). Thus reappearance of the abnormal behaviour will be followed by immediate reward. Eysenck (1963) therefore advocated the use of overlearning and booster sessions. It is submitted that it is of the utmost importance that homosexuals be

encouraged to use self-help techniques such as avoidance of homosexual contacts, suppression of homosexual masturbation and other fantasies, and covert sensitization, to prevent re-conditioning and reinforcement of homosexual behaviour, after termination of treatment.

Another factor probably making for relapse after AT is the mere knowledge by the client that shock will no longer be delivered. However, the problem may be overcome by threatening the client with further booster shock sessions on reappearance of the undesirable behaviour. Rapid extinction of CR's has been shown to take place when subjects are informed that shock would no longer be delivered after CS (Bridger and Mandel, 1965).

In retrospect, the study possibly contains a methodological error, which may have been a cause of the comparatively high relapse rate. Namely, the MAT procedure (and to a lesser extent the HAT procedure) consisted of the presentation of homosexual photographs to which the clients were asked to respond by visualizing homosexual acts. It was assumed that RCAS was being carried out by virtue of the fact that shock followed (or was contemporaneous with) the client making an imaginal response. It was also assumed that the mere act of looking at the photograph was an approach response. On the basis that RCAS was being used 100 per cent reinforcement was employed. However, it is feasible that classical conditioning was taking place. For, if the client was unable to imagine homosexual acts in response to the photograph, due to poor imagination, high levels of anxiety or insufficient time lapse between presentation of CS and onset of shock; then the situation consisted simply of CS-UCS pairings irrespective of clients' behaviour. The relevance of the above is that if classical conditioning was predominantly used, intermittent reinforcement rather than 100 per cent reinforcement should have been applied. In a preceding section it was noted that in classical conditioning intermittent reinforcement leads to conditioning more resistant to extinction than conditioning based on 100 per cent reinforcement.

It is submitted that the superior resistance to extinction of the conditioning obtained by HAT as compared to the effects of MAT, was due to the more comprehensive nature of HAT, in particular to the fact that HAT was more 'drive directed' than MAT. The low relapse tendency of Group HP subjects may indicate greater permanence of change coming from within (Group HP) as compared to change imposed from without (Group HMAT).

As regards the clients' subjective evaluation of the effects of treatment, it can be seen that the effect of the psychotherapy was mainly to diminish homosexual drive and increase heterosexual drive (Table 14). But psychotherapy had a lesser impact on homosexual fantasies. Since the emphasis in the psychotherapy treatment was on ignoring and suppressing homosexual drive and reinforcing heterosexual behaviour, these results ore not surprising. But the results indicate that thought-stopping and 'discipline' were not effective in suppressing homosexual thoughts, images and fantasies. In comparison, AT strongly inhibited homosexual ideations. The results therefore suggest that electrical AT should be considered as the treatment of choice, where the homosexuality to be treated is accompanied by strong homosexual fantasies. It was noted that during the course of AT clients, almost invariably, reported increasing difficulty in visualising homosexual fantasies. The difficulty in visualization of homosexual behaviour was often associated with loss of interest in the particular picture being used. Similar effects have been reported previously (Marks and Gelder, 1967; Hallum and Rachman, 1972). The suppression of homosexual fantasies was not persistent in all cases. Kimmel (1965) pointed out that in a situation where a noxious UCS follows a response, there will be an increment of the response when the UCS is afterwards omitted. But it is possible that with frequent booster sessions and high levels of shock a total suppression is possible.

The present results support contentions that AT leads primarily, not to the conditioning of fear, avoidance or anxiety, but to a change of attitude (i.e. indifference, a loss of interest or drive) towards the previously attractive deviant stimuli or behaviour (Hallam Rachman and Falkowski, 1972; Rachman and Teasdale, 1969a). Finally, Rachman and Teasdale (1969a) have described the generalization of the effects of AT, from the treatment situation to the real life situation, as a 'paradox' and expressed surprise that AT works at all. However, if it is accepted that AT works by suppressing drive underlying consummatory behaviour, it follows that suppression of drive (obtained in the treatment situation) will manifest as reduction of the behaviour (in the real life situation) formerly associated with that drive.

Compulsives: outcome of treatment

Although both psychotherapy and AT were significantly more effective in eliminating OCR's than non-treatment, AT was not significantly more effective than psychotherapy in treating OCR's. In retrospect, the study suffers from not having a treatment group treated solely by AT, without the use of other psychotherapy techniques. Therefore, the results do not show that AT, by itself, is not effective in treating OCR's, especially in view of evidence regarding the effectiveness of shock in disrupting OCR's (Kenny, Solyom and Solyom, 1973). Rather, the results indicate that the use of AT in conjunction with logotherapy, thought stopping, 'relationship' therapy and relaxation adds little to the effectiveness of the latter methods. It is possible that during AT, clients signalled suppression of the OCR, before actual suppression of the OCR, in order to escape shock. If so, the effects of the AT would have been weakened.

The main benefit of AT in treating OCR's seems to be a possibly lesser relapse rate. Thus compulsives treated by AT tended to relapse less than Group CP clients (Table 25). But since Groups

CP and CAT did not differ significantly on outcome 2, too much cannot be read into the difference in relapse rate. The major cause of relapse was onset of severe endogenous depression. In spite of efforts to exclude depressives from the study, 3 Group CP clients and 2 Group CAT clients, who had responded to treatment reported a return to the previous OCR's at the onset of depressive episodes. Attention has already been drawn to the fact that OCR's are precipitated by endogenous depression. It is also felt that the use of booster sessions after termination of treatment would aid in maintaining improvement and preventing relapse.

Finally, the present results do not support the contention that prognosis in treatment of OCR's is better in cases of short duration OCR's than in long duration OCR's.

Heterosexual adaptation and the treatment of homosexuality

Homosexuality can be most appropriately viewed as falling along a homosexual-heterosexual continuum, rather than being all-or-none behaviour (see Appendix 3 for a more detailed description). Further, homosexuality can be seen as consisting of varying degrees of sexual attraction to members of the same sex and sexual aversion or lack of sexual attraction to members of the opposite sex (Feldman and MacCulloch, 1971; Ovesey, 1969; Wilson and Davison, 1974). Therefore, successful treatment of homosexuality implies heterosexual adaptation as well as removal of homosexual behaviour. More recently, Wilson and Davison (1974) have questioned the necessity of devaluing homosexual arousal by AT, before reinforcing the occurrence of heterosexual arousal. They further suggested that the goal of treatment of homosexuality may be viewed as the development of heterosexual arousal rather than the elimination of homosexual behaviour. But Herman, Barlow and Agras (1974) felt that in some cases increasing heterosexual arousal may be insufficient treatment of homosexuality and that methods such as AT have to be used in order to decrease homosexual drive. Other

writers have insisted that homosexual behaviour must first be interrupted before alternative heterosexual behaviour can emerge (Kanfer and Phillips, 1970; Marshall, 1971), but it may be premature to assert that homosexual arousal has to be reduced before heterosexual responsiveness is increased (Wilson and Davison, 1974).

A particular problem raised in the treatment of homosexuality is that 'successfully' treated clients may relapse as result of failure to adapt heterosexually (Jacobs, 1967). Four clients (2 from Group HMAT and one each from Group HP and Group HHAT respectively), gave as the cause of relapse a failure to make satisfactory heterosexual contact, leading to a deliberate choice to return to homosexual activity. A full program for treatment of homosexuality should include removal of any heterosexual anxieties and heterophobic avoidance reactions, and intensive training in heterosexual skills and techniques (Barlow, 1973; Feldman and MacCulloch, 1971, Jacobs, 1972; Kanfer and Phillips, 1970; Wilson and Davison, 1974). The failure to sufficiently stress such training in the present study therefore probably accounts for some of the relapses encountered.

Further, the present results showed that suppression of homosexual drive is not automatically accompanied by an increase in heterosexual drive, although it has been claimed that heterosexual responsiveness increases during AT of homosexuality (Bancroft, 1969; Barlow, Leitenberg and Agras, 1969). Relatively few of the homosexuals who responded in terms of decreased homosexual drive reported an increased heterosexual drive (Table 14). Therefore a vigorous treatment program to encourage heterosexual behaviour should be included in any AT program. The treatment techniques were insufficient treatments for homosexuality in terms of heterosexual adjustment. HAT is clearly a powerful method of eliminating homosexual behaviour but additional techniques for establishing heterosexuality must be added.

It was submitted that the core of homosexual behaviour is underlying homosexual drive. If the argument is correct it carries the implication that treatment of homosexuality should be aimed at reducing such homosexual drive. The fact that HAT emerged as more effective than MAT tends to substantiate the necessity of directing treatment at drive. However, the suppression of homosexual drive is not likely to involve concomitant suppression of all sexual drive. Therefore, the effects of AT in suppressing homosexual behaviour are likely to be only temporary unless the client learns alternate heterosexual behaviour. If the client does not acquire heterosexual behaviour he will, as a result of 'successful' AT, be left asexual and only has an untenable choice between no-sexuality and homosexuality. When no-sexuality fails, as it is bound to, the client can only fall back on homosexual behaviour to reduce his sexual drive. As West (168) commented, the suppression of homosexual drive by AT without establishment of heterosexuality, 'will leave others impotent and frustrated and in a worse state than they were before'. It has been pointed out that the effectiveness of AT, in treating homosexuality, probably depends to a marked degree on the availability of and client's ability to utilize alternative behaviour (Feldman, 1966). Other writers have felt that the effectiveness of response suppression by AT is increased by the provision of an alternate non-punished response, motivated by the same drive as the undesirable, punished response, and followed by similar reinforcement (Azrin and Holz, 1966; Kanfer and Phillips, 1970; Rachman and Teasdale, 1969a). Of course if a homosexual can be helped to establish heterosexual responses, such retraining in itself may reduce homosexual drive through a general lowering of sexual tension (see also Stevenson and Wolpe, 1960). It is suggested that the teaching of heterosexual skills is an essential part of any therapy program for homosexuality, without which the use of AT is likely to lead to only an untenable situation of asexuality in which the client

will continually be fighting against himself and his sexual drive. Furthermore 'fighting against' oneself is likely to lead to guilt and to be ineffective in suppressing the undesired behaviour (Tinling, 1972). It seems far more reasonable to use AT as an adjunct to a broad spectrum therapy regime, in which the focus in therapy is on aiding the client to learn new responses and skills, so that he can exercise his option to choose alternate responses and behaviours. The use of AT alone to suppress homosexual behaviour, without providing heterosexual skills, is training in 'non-behaviour' and creates a behavioural vacuum (Tinling, 1972).

It will be recalled that the main methods of increasing heterosexuality consisted of the encouragement of heterosexual contact, the advice to replace homosexual masturbation fantasies by heterosexual masturbation fantasies and treatment of expressed heterosexual anxieties by counselling. However, the above methods were applied in a crude, unsophisticated and not sufficiently vigorous manner. Whereas, the need for a comprehensive and vigorous treatment program to foster heterosexual behaviour is particularly crucial in the light of evidence regarding the importance of avoidance or fear of heterosexuality in the genesis and maintenance of homosexuality (Barlow, 1973; Bieber et al, 1963; Oversey, 1969; Ramsay and Van Velzen, 1968). Yet, in spite of such evidence AT directed mainly at suppressing homosexual behaviour has been increasingly advocated as the treatment of choice (Barlow, 1972). Furthar, the emphasis on AT suggests that workers may be ignoring the goal of heterosexual adaptation (Barlow, 1973).

Recent publications on the therapeutic use of masturbation, showed that masturbation and masturbation fantasies can be most effective methods of increasing heterosexual drive and decreasing homosexual drive (Annon, 1973; Davison, 1968; Marquis, 1970). By comparison with the methods described by Annon, the masturbation methods used in the present study were both insufficient and

perfunctory. It is felt that had masturbation been used in a more sophisticated manner, better results may have been obtained in this study.

Insufficient attention was given to overcoming the anxieties felt by clients regarding heterosexual sex. In retrospect it seems that to merely counsel clients as regards 'in vivo' approaches or methods for overcoming heterosexual fears and anxieties, is somewhat naive. Firstly, most of the clients did not have female partners with whom they could put such methods into practice. Secondly, many of the homosexuals avoided and feared females and their fears and anxieties precluded any attempt at heterosexual sex. Therefore, it may have been better to use a method such as systematic desensitization (Wolpe, 1958) to eliminate the heterosexual fears and anxieties of the clients, in addition to counselling, before sending them 'out into the world'. Various writers have described the use of systematic desensitization for elimination of heterosexual fears and anxiety (Bancroft, 1970; Huff, 1970, Kraft, 1969; LoPiccolo, 1971). Although the effectiveness of systematic desensitization in increasing heterosexual responsiveness has not been experimentally verified (Barlow, 1973), the methods of psychocybernetics (Maltz, 1960), i.e. frequent visualisation of successful heterosexual sex, may aid in the establishment of heterosexual behaviour. The pairing of homosexual slides and movies (UCS) and heterosexual slides (CS), has also been shown to aid in the establishment of heterosexual responses in homosexuals (Herman, Barlow and Agras, 1974). Further, homosexuals often lack heterosexual social skills relating to the social preliminaries of sexual relationships. such as those concerned with the initial social contacts and social interaction with persons of the opposite sex (Feldman, 1968; Feldman and MacCulloch, 1971; Wanfer and Phillips, 1970). The current study did not include the teaching of such heterosocial skills and was also incomplete in this respect. It is suggested that counselling,

psychodrama, assertive training and mixed encounter groups should be utilized to teach heterosocial skills and reduce heterosexual anxieties, in a full treatment program of homosexuality (Birk, Huddleston, Miller and Cohler, 1971; Cautela and Wisocki, 1969; Ellis, 1959).

Variables effecting the treatment of homosexuality and OC's

In accordance with previous findings a significant relationship was found between the pre-treatment Kinsey ratings and outcome of treatment of homosexuality (Feldman and MacCulloch, 1971). Since the Kinsey scale measures hetero-homosexual 'balance' it may be said that homosexuals with heterosexual experience, have better treatment prognosis than homosexuals with no heterosexual experience. The Kinsey scale emerges as an excellent indicator of prognosis of treatment.

Surprisingly, no significant positive correlation between motivation and outcome was found for both the homosexuals and compulsives. It is possible that the MS used to measure motivation was inadequate. Further, the client samples (both homosexuals and compulsives) were very homogeneous in terms of high motivation scores. It is conceivable that had the study included both highly and poorly motivated subjects, that a more definite motivation-outcome relationship would have emerged.

However, the importance of motivation was graphically illustrated by a 26 year old homosexual (treated by MAT) who withdrew after 14 sessions of AT. At the time of withdrawal he reported that his presenting homosexual drive and fantasies had been completely eliminated. He felt complete antipathy towards sexual contact with females and when it appeared that his homosexuality was being eliminated, he forced himself to masturbate with homosexual fantasies. At first he was unable to conjure up arousing homosexual fantasies. However, after masturbating, over a period of 8 days, at least once a day and usually twice a day, with forced homosexual fantasies, he

began once again to be aroused by such fantasies. After this process of forced reconditioning he withdrew from treatment.

It is also felt that the high level of motivation of the clients, as manifested by high mean scores on the MS, was a factor determining the relatively low rate of withdrawal from treatment of clients undergoing AT, despite high levels of shock used. Compulsives tended to be more highly motivated than the homosexuals (Tables 5 and 20) probably on account of the severity of the OCR's, and the lesser percentage of compulsives withdrawing from AT is attributed to this fact. Fears have been expressed that the bombardment of clients with high levels of shock would lead to large scale withdrawal from treatment (Feldman and MacCulloch, 1971). But the present results do not confirm such fears. Further, evidence already discussed, has stressed the need for high levels of shock in AT and in a recent study a significant positive correlation was found between level of shock and successful treatment of homosexuality by AT (Tanner, 1973).

Further, clients not choosing or wishing to eliminate a behaviour pattern are not likely to respond to AT and are more likely to deliberately undo the effects of AT (Hallam and Rachman, 1972; Hammersley, 1957). It may be expected that in many instances change comes from within and is facilitated by AT rather than caused by it. It is suggested that persons undergoing AT be helped to perceive their own responsibility for and freedom of choice in change. In this context it can be noted that Feldman and MacCulloch (1971) found that the best prediction of outcome of AT was subject's ego strength. It may be assumed that persons with high ego strength are better able to choose or take responsibility than those with low ego strength.

No significant relationships were found between outcome of therapy and age of client for both homosexuals and compulsives. Nor did duration of homosexual behaviour or OCR's before onset of treatment correlate at all with outcome.

It was the writer's subjective impression that an important factor in maintaining the participation of the clients in the treatment program was the strength of the client-therapist relationship (see also Andrews, 1966; Wilson, Hannon and Evans, 1968). Five of the clients who discontinued treatment gave as their reason lack of faith in the therapist and treatment, and lack of rapport between client and therapist was probably a factor in premature termination of treatment by other clients. Furthermore, in view of the unpleasantness of AT, the therapist found it necessary to frequently encourage and reassure the clients to continue treatment. The impression was also gained that clients who responded well to treatment tended to have a good relationship with and trust in the writer. Although the importance of the client-therapist relationship in behaviour therapy has been denied (Wolpe, 1962), there is considerable evidence that the client-therapist relationship is significant in determining the outcome of therapy in general and behaviour therapy in particular (Andrews, 1966; Goldstein, 1971; Goldstein, Heller and Sechrest, 1966; Meyer and Gelder, 1963; Murray and Jacobson, 1971; Shoben, 1963; Truax, 1963; Wilson, Hannon and Evans, 1968). Wolpe (1962) handed over treatment of a phobic client half-way through therapy to another therapist. He then cited the fact that the client was cured as proof of the unimportance of the client-therapist relationship. However, there was a constant client-therapist relationship throughout treatment, albeit with two different therapists, and the extent to which the client felt rapport with his two different therapists was not explored by Wolpe.

No relationship between neuroticism and outcome was found (for both homosexuals and compulsives) although it has been claimed that highly neurotic and unstable individuals are less likely to benefit from AT than less neurotic individuals (Feldman and MacCulloch, 1971; Morgenstern, Pearce and Rees, 1965). Drive theory (Spence and Taylor, 1951) predicts that individuals with high N scores (high

drive and presumably high anxiety scores) condition better than individuals with low drive. The lack of correlation between neuroticism and outcome, in this study, argues against drive theory and is in agreement with other work which has failed to show a relationship between anxiety/neuroticism and conditioning (Barr and McConaghy, 1974).

The results (for homosexuals and compulsives) do not confirm the theory that extraverts condition more poorly than introverts (Eysenck, 1957). It might have been expected, in terms of Eysenck's theory, that introverts would have conditioned better and therefore responded better to AT than extraverts. But no relationship between outcome and extraversion was found. Other studies have also failed to show a relationship between outcome of AT and extraversion (Feldman and MacCulloch, 1971) and between conditionability and extraversion (Jacobs, 1964).

A possible explanation for the lack of relationship between scores on the EPI and outcome is fallibility of the E scale as an adequate measure of extraversion (Jacobs, 1964; McGuire, Mowbray and Vallance, 1963). Eysenck (1957) conceived of extraversion as a central process but the E scale seems to measure such factors as self-confidence and sociability, which need not necessarily be directly related to the hypothesized underlying neurophysiological process propounded by Eysenck as the basis of extraversion.

The theory of regression (Campbell and Stanley, 1963) has been mentioned. Since the homosexuality and OCR's tended to be both chronic and acute at the time of treatment, it could be expected that regression may have accounted for some of the change reported by clients. Regression would be shown by spontaneous recovery or improvement by clients in the control groups. The fact that relatively few clients in the control groups improved spontaneously, indicates that regression was probably of little influence. However, a factor which did possibly bias the results, was that although all clients in the experimental group were led to expect

improvement, clients in the control groups were not given a similar expectation. The above may be relevant in view of evidence that clients' expectations have a bearing on the outcome of treatment (Goldstein, Heller and Sechrest, 1966). Another theory which may partially elucidate the effects of AT is that of cognitive dissonance (Festinger, 1957). Festinger described dissonance as psychologically uncomfortable cognitive inconsistencies which give rise to pressure to reduce the dissonance. The voluntary participation in an unpleasant treatment procedure such as AT, in which much hope and energy has been invested, may be inconsistent with the lack of expected change as result of treatment. But cognitive dissonance theory has been criticised on a number of points (Tedeschi, Schlenker and Bonoma, 1971). Festinger (1957) pointed out that dissonance may be reduced by changing behaviour, by adopting a negative attitude towards the deviate behaviour or by reducing the frequency of that behaviour (see also Carlin and Armstrong, 1968; Hallam and Rachman, 1972). Further it has been shown that mere participation in treatment leads to changes regardless of conditioning method used in the treatment (Carlin and Armstrong, 1968).

The theory of 'cognitive rehearsal' (Bandura, 1969) may also be relevant to understanding the effects of AT. Bandura postulated that re-experience (in imagination or real life) of the CS used in AT, re-activates memories and conditioned physiological reactions associated with the aversive UCS thereby strengthening the CS-UCS bond through constant CS-UCS association. Hallam and Rachman (1972) criticised cognitive rehearsal on the grounds that 'patients appear to think less frequently about their deviant habit after a course of aversion therapy'. But the above criticism appears to be misdirected since the point of cognitive rehearsal is not the frequency with which the CS-UCS bond is repeated after therapy, but rather that when the deviant CS's are re-experienced by the client, they are followed by memories and physiological reactions associated with the UCS.

The fact that a considerably higher percentage of clients treated by AT evidenced suppression of homosexual fantasy and drive than did Group HP clients treated without AT (Table 14), may be interpreted as being consistent with a cognitive rehearsal theory. Thus, it may be postulated that for clients treated by AT, the experience of homosexual stimuli outside the treatment situation was followed by associations with the UCS; whereas, for Group HP clients the cognitive rehearsal did not take place due to lack of experience of the CS-UCS sequence.

Learning theory and AT

It is often difficult to separate the effects of classical and instrumental conditioning in AT (Blakemore, Thorpe, Barker, Conway and Lavin, 1963). The purity of either classical or instrumental conditioning in the application of AT is a fiction (Kanfer and Phillips, 1970). It may also be noted that RCAS always involves some classical conditioning (Kanfer and Phillips, 1970, Rachman and Teasdale, 1969a). The present study illustrates the difficulty in differentiating between classical and instrumental conditioning. Thus, both MAT and HAT appear to be a mixture of classical, operant, escape and avoidance conditioning. For example, in the HAT procedure shock was contingent upon the fantasy and arousal response of the client, implying operant conditioning. At the same time, HAT also involved repeated pairings of the pictorial material and shock regardless of the response of client, implying classical conditioning. Also in HAT, avoidance learning could have taken place when the fantasy and arousal were used as the CS's. Clients could avoid the UCS by avoiding the fantasy or arousal. Further, escape learning may have taken place during AT, as clients may have escaped shock before suppression of homosexual fantasies or arousal, by signalling termination simply to avoid shock.

Questioning of clients, at the end of each session revealed that in most cases the level of shock was high enough to cause almost immediate suppression of client's fantasies and arousal. Three clients (2 Group MAT and 1 Group HAT respectively) reported that they were signalling terminations of shock before suppression of arousal or fantasy. These clients had very poor toleration for and fear of shock as a result of which all three discontinued treatment. It has already been pointed out that punishment is most effective when escape is prevented.

Discussion as regards the learning or conditioning principles underlying AT should be tempered by evidence that 'factors other than conditioning may account for the behavioural changes in aversive conditioning paradigms' (Carlin and Armstrong, 1968). It should also be borne in mind that 'the connections among aversion therapy, psychological theory and verified experimental data are tenuous' (Rachman and Teasdale, 1969a).

Finally, learning theory concepts may be inadequate to explain the effects of behaviour therapy techniques such as AT (Buchwald and Young, 1969; Lazarus, 1971). It has therefore been suggested that the choice of a behaviour therapy method, in treating a particular problem, should be based on its effectiveness in treating that problem, rather than on considerations of theoretical purity or adherence to any particular learning theory (Jacobs, 1972). Thus HAT clearly emerges as the AT method of choice in treating homosexuality on the basis of its effectiveness notwithstanding the lack of clarity as regards its underlying conditioning principles.

# APPENDIX 1

## DESCRIPTION OF THE AAC METHOD

Feldman and MacCulloch (1965) described the AAC procedure as follows:

> The patient is told that he will see a male picture, and that several seconds later he might receive a shock. He is also told that he can turn off the slide by pressing a switch, with which he is provided, whenever he wishes to do so, and that the moment the slide leaves the screen, the shock will also be turned off. Finally he is told that he will never be shocked when the screen is blank. It is made clear to him that he should leave the slide on the screen for as long as he finds it sexually attractive. The first slide is then presented. The patient has the choice of switching it off, or leaving it on the screen. Should he switch it off within eight seconds he is not shocked, and this is termed an 'avoidance response'. Should he not switch off within eight seconds, he receives a shock. If the shock strength is not sufficiently high to cause him to switch off immediately it is increased until he does so. The moment the patient performs the switching off response, the slide is removed and the shock is terminated ... This is termed an 'escape trial'...
>
> When the patient has avoided on three successive trials, we place him on a pre-determined schedule of reinforcement, ... There are three basic types of trials:
>
> (i) Reinforcement (R) Trials. One third of all attempts to avoid are allowed to succeed immediately.
>
> (ii) Non-Reinforced (NR) Trials. One third of all attempts to avoid are not allowed to succeed; that is, in spite of the patient's attempts to switch off and to say 'No', he has to sit out the eight seconds, and receive a brief shock. The shock and the slide terminate simultaneously.
>
> (iii) Delayed (D) Trials. One third of all trials are delayed; that is for a period of time within the eight seconds period, the patient's attempts to switch off fail to succeed. He does eventually succeed before eight seconds has elapsed. The length of time for which he is delayed may be either 4, 6 or $7\frac{1}{2}$ seconds after the onset of the slide varied randomly.

The three types of trial, reinforced, non-reinforced and delayed, appear in random order, and the inter-trial interval is also randomly varied.

A more detailed description of the AAC procedure can be found in Feldman and MacCulloch (1971).

## APPENDIX 2

## REQUIREMENTS OF RCAS

Azrin and Holz (1966) listed the following requirements for RCAS:

> (1) The punishing stimulus should be arranged in such a manner that no unauthorized escape is possible. (2) The punishing stimulus should be as intense as possible. (3) The frequency of punishment should be as high as possible; ideally the punishing stimulus should be given for every response. (4) The punishing stimulus should be delivered immediately after the response. (5) The punishing stimulus should not be increased gradually but introduced at maximum intensity. (6) Extended periods of punishment should be avoided, especially where low intensities of punishment are concerned, since the recovery effect may thereby occur. Where mild intensities of punishment are used, it is best to use them for only a brief period of time. (7) Great care should be taken to see that the delivery of the punishing stimulus is not differentially associated with the delivery of reinforcement. Otherwise the punishing stimulus may acquire conditioned reinforcing properties. (8) The delivery of the punishing stimulus should be made a signal or discriminative stimulus that a period of extinction is in progress. (9) The degree of motivation to emit the punished response, should be reduced. (10) The frequency of positive reinforcement for the punished response should similarly be reduced. (11) An alternative response should be available which will not be punished but which will produce the same or greater reinforcement as the punished response ... (12) If no alternative response is available, the subject should have access to a different situation in which he obtains the same reinforcement without being punished.

Church (1969) summarized the requirements of RCAS as:

(1) Severity of the noxious stimulus. The magnitude of response suppression is a direct function of the severity of the punishment, both its intensity and duration.

(2) Prior exposure to the noxious stimulus. In the presence of a noxious stimulus of a particular severity a subject has a tendency to persist in the performance it has acquired in the context of previous exposure to noxious stimuli. Therefore, prior

exposure to a noxious stimulus may either increase or decrease the effectiveness of subsequent punishment.

(3) Contingency between response and noxious stimulus. At any given severity of a noxious stimulus, the magnitude of response suppression is greater if the noxious stimulus occurs immediately following a response than if it occurs independently of the response.

(4) Contiguity between response and noxious stimulus. The magnitude of response suppression decreases as the temporal interval between response and punishment increases, even when the dependence of punishment upon response is constant.

(5) Discriminative stimulus prior to the noxious stimulus. A warning signal preceding a punishment reduces the magnitude of suppression in the absence of the warning signal.

(6) Punishment of various responses in a behaviour sequence. Punishment of the first response in a behaviour sequence produces greater response suppression than punishment of later responses in the behaviour sequence. The decrease in response rate prior to the punished response (anticipation of punishment) is a function of the discriminability of the punished response; the decrease in response rate following a punished response (reaction to punishment) is a function of the number of responses between the punished response and the reinforced response.

# APPENDIX 3

## DESCRIPTION OF THE KINSEY SCALE

Kinsey, Pomeroy and Martin (19[illegible]) described homosexual-heterosexual behaviour along the following 7 point continuum:

0. Individuals are rated as 0's if they make no physical contacts which result in erotic arousal or orgasm, and make no psychic responses to individuals of their own sex. Their socio-sexual contacts and responses are exclusively with individuals of the opposite sex.

1. Individuals are rated as 1's if they have only incidental homosexual contacts which have involved physical or psychic response, or incidental psychic responses without physical contact. The great preponderance of their socio-sexual experience and reactions is directed toward individuals of the opposite sex. Such homosexual experiences as these individuals have may occur only a single time or two, or at least infrequently in comparison to the amount of their heterosexual experience. Their homosexual experiences never involve as specific psychic reactions as they make to heterosexual stimuli. Sometimes the homosexual activities in which they engage may be inspired by curiosity, or may be more or less forced upon them by other individuals, perhaps when they are asleep or when they are drunk, or under some other peculiar circumstance.

2. Individuals are rated as 2's if they have more than incidental homosexual experience, and/or if they respond rather definitely to homosexual stimuli. Their heterosexual experiences and/or reactions still surpass their homosexual experiences and/or reactions. These individuals may have only a small amount of homosexual experience or they may have a considerable amount of it, but in every case it is surpassed by the amount of heterosexual experience that they have within the same period of time. They usually recognize their quite specific arousal by homosexual stimuli, but their responses to the opposite sex are still stronger. A few of these individuals may even have all of their overt experience in the homosexual, but their psychic reactions to persons of the opposite sex indicate that they are still predominantly heterosexual ...

3. Individuals who are rated 3's stand midway on the heterosexual-homosexual scale. They are about equally homosexual and heterosexual in their overt experience and/or their psychic reactions. In general, they accept and equally enjoy both types of contacts, and have no strong preferences for one or the other. Some persons are rated 3's, even though they may have a larger amount of experience of one sort, because they respond psychically to partners of both sexes, and it is only a matter of circumstance that brings them into more frequent contact with one of the sexes...

4. Individuals are rated as 4's if they have more overt activity and/or psychic reactions in the homosexual, while still maintaining a fair amount of heterosexual activity and/or responding rather definitely to heterosexual stimuli.

5. Individuals are rated 5's if they are almost entirely homosexual in their overt activities and/or reactions. They do have incidental experience with the opposite sex and sometimes react psychically to individuals of the opposite sex.

6. Individuals are rated as 6's if they are exclusively homosexual, both in regard to their overt experience and in regard to their psychic reactions.

# APPENDIX 4

## THE MS

The MS scale, filled in by the clients, consisted of the following questions:

1. Give your reasons for coming for treatment at the present time.

2. Did you come of your own free will and decision or were you encouraged to do so by someone else? (if so state by whom).

3. Which of the following statements applies to you?

   (1) I do not really want to change, I am happy as I am.

   (2) I am not sure how I feel about change, but am willing to give treatment a try.

   (3) I would like to change.

   (4) I would like to change very much.

   (5) It is of the very greatest importance to me to change.

4. Do you consider your problem to be:

   (1) Very slight

   (2) Slight

   (3) More than slight/but not quite strong

   (4) Strong

   (5) Strong

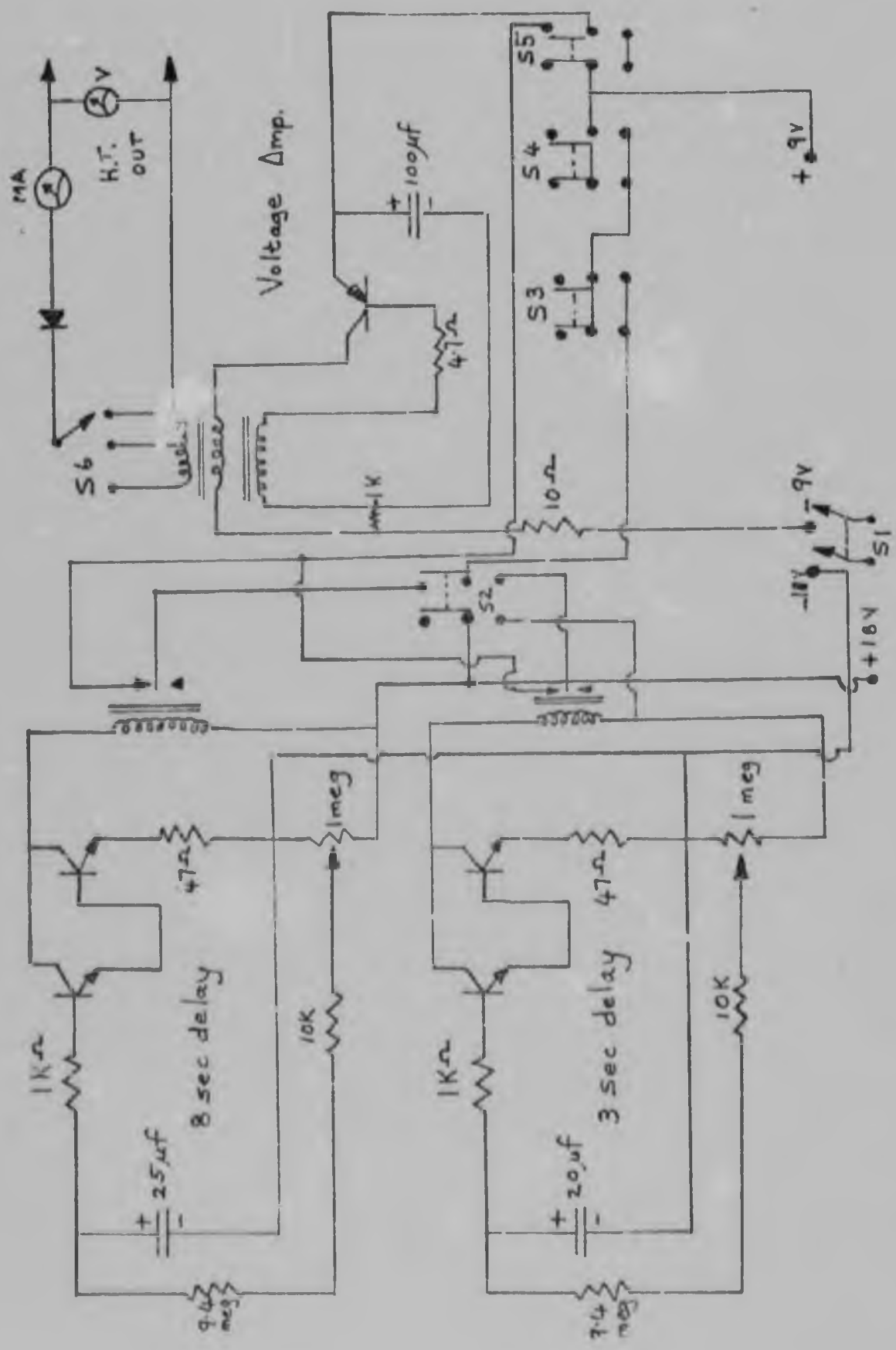
5. Why do you wish to be cured? (if not please state why).

On the basis of the client's response to the 5 above questions, he was given an overall motivation rating on a 5 point scale. If the client had not come for treatment of his own choice he was given a rating of 2, unless he had rated himself 1 on question three, in which case he was rated as 1. If the client had come for treatment of his own free choice, his motivation rating was determined by his self rating on questions three and four. The lower of the 2 ratings was taken as the motivation rating. Thus, if the client

had rated himself 4 on question three ('I would very much like to change') and 5 on question four ('I consider my problem to be very strong') he was given a motivation rating of 4. It should be noted that homosexuals who appeared for treatment as the result of either a broken love affair or unrequited love, were considered to have appeared for treatment under duress and not of their own choice.

APPENDIX 5

CIRCUIT OF THE CONDITIONING .. PARATUS



# APPENDIX 6

## ANALYSIS OF VARIANCE SOURCE TABLES

### TABLE 1

HOMOSEXUALS: OUTCOME RATINGS

| SV | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Groups (G) | 66.349 | 3 | 22.116 | 12.08 | <.001 |
| Error Between | 139.690 | 76 | 1.830 | | |
| Outcome (O) | 3.025 | 1 | 3.025 | 20.13 | <.001 |
| O x G | 2.225 | 3 | 0.741 | 4.94 | <.05 |
| Error Within | 11.750 | 76 | 0.150 | | |

### TABLE 2

HOMOSEXUALS: KINSEY RATINGS

| SV | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Groups (g) | 121.979 | 3 | 40.659 | 6.40 | <.05 |
| Error Between | 482.500 | 76 | 6.350 | | |
| Kinsey Rating (K) | 99.558 | 2 | 49.779 | 65.50 | <.001 |
| K x G | 44.708 | 6 | 7.451 | 9.80 | <.01 |
| Error Within | 115.730 | 152 | 0.76 | | |

### TABLE 3

COMPULSIVES: OUTCOME RATINGS

| SV | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Groups (G) | 55.416 | 2 | 27.708 | 23.68 | <.001 |
| Error Between | 66.880 | 57 | 1.170 | | |
| Outcome (O) | 6.075 | 1 | 6.075 | 18.97 | <.001 |
| O X G | 1.05 | 2 | 0.525 | 1.64 | - |
| Error Within | 18.37 | 57 | 0.320 | | |

# APPENDIX 7

## THE FOLLOW-UP QUESTIONNAIRE

The following covering letter was sent with the follow-up questionnaire.

> I am doing a survey to ascertain the effects of treatment. I would like to know how you responded to treatment. The information you supply will be of great help in working out what treatment methods work best and will therefore be most useful in aiding me to help other people.
>
> I have therefore attached a simple questionnaire and would greatly appreciate your co-operation in filling it out as honestly as possible and returning it as soon as you can, using the stamped, addressed envelope.
>
> All information is strictly confidential and is only for my own records. I wish to stress that the information supplied will only be of value if the questionnaire is answered with complete frankness.
>
> Thank you for your co-operation.

The questionnaire consisted of the following questions to which the client had to ring the appropriate answer, except for the questions, 1,10,11, which were open-ended.

1. Briefly state your reasons for coming for treatment.

2. Were the problems for which you came for treatment helped by the treatment you received?

   YES. NO. MAYBE.

2a. If YES, at the end of treatment, did you feel the problems were

   CURED (i.e. completely eliminated.)

   GREATLY IMPROVED. (i.e. very largely eliminated)

   SLIGHTLY IMPROVED.

   NOT CHANGED.

2b. If MAYBE, please explain.

3. Have the problems for which you were treated returned in any form?

YES. NO.

4. To what extent are the problems for which you consulted Mr Jacobs still present?

LARGELY. NOT AT ALL. SLIGHTLY. AS BEFORE.

5. Did you think that your relationship with Mr. Jacobs was

GOOD. BAD. SATISFACTORY. DON'T KNOW.

6. When you started treatment did you believe that you could be helped by the treatment given?

YES. NO. DON'T KNOW.

7. When you came for treatment did you very much want to be cured of your problems?

YES. NO. DON'T KNOW.

8. Did you consider your problems to be

VERY STRONG. STRONG. MODERATE.

SLIGHT VERY SLIGHT.

9. Which of these statements applied to you when you first came for treatment?

a) I did not really want to change.

b) I was not sure how I felt about change, but was willing to give treatment a try.

c) I wanted to change.

d) I wanted to change very much.

e) It was of greatest importance for me to change.

10. Please state why you stopped treatment?

11. Briefly describe the changes, if any, you feel that treatment has brought about.

12. Other comments or remarks, if desired.

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