AN INVESTIGATION OF HYPNOTIC AMNESIA

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CURRICULUM STUDIORUM

Gordon A. Bissessar was born September 20, 1933, in Trinidad, B.W.I. He received the Bachelor of Science degree with a major in Chemistry from St. Francis Xavier University, Antigonish, Nova Scotia, in May 1956. The title of his thesis was The Electrolytic Dissociation of Nickel Oxide.

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INTRODUCTION

The topic of hypnosis has a long and confused history. Emerging from chronic disrepute, it now enjoys official recognition by the American Medical Association and other scientific associations.

With its therapeutic use on the increase, it has become essential to explain the long observed phenomena connected to hypnosis. One of these, and perhaps the best known, is the forgetting phenomenon often referred to as Posthypnotic Amnesia or simply as Hypnotic Amnesia.

This study is an investigation of this particular property of hypnosis. The first three chapters are devoted to an explanation of the problem: Chapter I presents a limited overview of the whole complex of hypnosis, which serves to identify the location of the posthypnotic amnesia.

Having been identified, the concept of posthypnotic amnesia is elaborated with a historical survey and a presentation of several theoretical concepts about the phenomenon.

A review of the pertinent literature demonstrates the controversial nature of posthypnotic amnesia and leads to an exposition of the experiment undertaken in this study.

The final chapter discusses the obtained results, relates them to previous studies and makes suggestions for further research.

CHAPTER I

AN OVERVIEW OF HYPNOSIS

Before taking up the specific point of posthypnotic amnesia, it would seem appropriate to look at a general picture of hypnosis. This will begin by a study of three authorities and will lead to a closer examination of the phenomenon of hypnosis so as to localize the posthypnotic amnesia.

Any list of authorities in a given field can be criticised for lack of completeness. Since every country may claim authorities in every field, those about to be presented will be chosen from England and North America for a period from 1900 to the present time.

Clark Hull, late Professor of Psychology at Yale University, can certainly be regarded as an authority; his book[1] is still a milestone in the history of experimental and scientific hypnosis. Therein, he presents the views of Janet and Prince on the theory that hypnosis is essentially a state of dissociation;[2] he goes on to discuss the sleep theory of hypnosis[3] citing Liebeault and Bernheim together with the

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1 Hull, C.L., Hypnosis and Suggestibility, New York, Appleton-Century Co., 1933, 416 p.

2 Hull, Op. Cit., p. 167.

3 Hull, Op. Cit., p. 193.

experimental evidence which distinguishes between sleep and hypnosis. Hypnosis as a state of heightened suggestibility receives attention in another chapter,[4] and finally "Hypnosis Regarded as Habit" is the last theory presented.[5]

Among the living authorities who can be cited today are: Dr. George Estabrooks, Head of the Department of Psychology at Colgate University; Dr. S.J. Van Pelt, Editor of the British Journal of Medical Hypnotism and author of several books on the subject; Dr. Milton H. Erickson of Phoenix, Arizona, a psychiatrist and psychologist who has published many articles on the subject and is Editor of the American Journal of Clinical Hypnosis; and also Dr. Milton V. Kline, past Editor of the International Journal of Clinical and Experimental Hypnosis.

Dr. Estabrooks' own theory is set forth in his book.[6] He likens the brain to a photographic plate on which an individual's experiences leave an indelible impression. According to him, hypnotism is one of the only two "sensitizers" of the brain plate - the other sensitizer being emotion. Through the mechanism of suggestion, verbal or nonverbal, hypnotism affects the brain so as to bring about emotional changes in

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4 Hull, Op. Cit., p. 285.

5 Hull, Op. Cit., p. 334.

6 Estabrooks, G.H., Hypnotism, New York, Dutton and Co., 1957, p. 133.

the individual. This is a rather general theory and is based on many assumptions of which Dr. Estabrooks was aware when he proposed his theory. He himself mentioned the controversy still existing around the concept of instincts and the pleasure-pain principle both of which topics were incorporated into his theory.

Another theory that is of interest is that of Van Pelt, for which the author claims originality in his book.[7] According to him, hypnosis is really a superconcentration of the mind. In the ordinary state the mind is occupied with many different impressions, so that the mind power is scattered; whereas, in hypnosis the mind is concentrated to a degree much higher than possible in the ordinary state, so that when a suggestion is given, all of it is absorbed and the effect is much stronger than if the same suggestion were to be given in the ordinary waking state.

It must be borne in mind however, that all these theories are just theories and that a general criticism can be made against them collectively; namely, that no one theory explains all the observable phenomena of hypnosis.

These phenomena are well known to practitioners of clinical and experimental hypnosis and have been classified into categories which serve to identify the depth of hypnosis.

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7 Van Pelt, S.J., Secrets of Hypnotism, London, Neville Spearman Ltd., 1958, p. 4.

Five levels or stages of depth are differentiated and these collectively encompass about fifty individual characteristics. One system of classification is reproduced here in order to give a complete picture of hypnosis and its characteristics, and also to locate the particular phenomenon with which this study is concerned.

LeCron-Bordeaux Scoring System for Indicating Depth of Hypnosis:[8]

Depth		Symptoms and Phenomena Exhibited
Insusceptible	0	Subject fails to respond in any way
Hypnoidal	1	Physical relaxation
	2	Drowsiness apparent
	3	Fluttering of eyelids
	4	Closing of eyes
	5	Mental relaxation, partial lethargy of mind
	6	Heaviness of limbs
Light Trance	7	Catalepsy of eyes
	8	Partial limb catalepsy
	9	Inhibition of small muscle groups
	10	Slower and deeper breathing, slower pulse
	11	Strong lassitude (disinclination to move, speak, think or act)
	12	Twitching of mouth or jaw during induction
	13	Rapport between subject and operator
	14	Simple posthypnotic suggestions heeded
	15	Involuntary start or eye twitch on awakening
	16	Personality changes
	17	Feelings of heaviness throughout entire body
	18	Partial feeling of detachment

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8 LeCron, L.M. and J. Bordeaux, Hypnotism Today, New York, Grune & Stratton, 1949, p. 64-67.

Depth	Symptoms and Phenomena Exhibited
Medium Trance	19 Recognition of trance (difficult to describe but definitely felt)
	20 Complete muscular inhibitions (kinaesthetic delusions)
	21 Partial amnesia (suggested amnesia)
	22 Glove anaesthesia
	23 Tactile illusions
	24 Gustatory illusions
	25 Ofactory illusions
	26 Hyperacuity to atmospheric conditions
	27 Complete catalepsy of limbs or body
Deep or Somnambulistic Trance	28 Ability to open eyes without affecting trance
	29 Fixed stare when eyes are open; pupillary dilation
	30 Somnambulism
	31 Complete amnesia (spontaneous amnesia)
	32 Systematized posthypnotic amnesia
	33 Complete anaesthesia
	34 Posthypnotic anaesthesia
	35 Bizarre posthypnotic suggestions heeded
	36 Uncontrolled movements of eyeballs - eye coordination lost
	37 Sensation of lightness, floating, swinging, of being bloated or swollen, detached feeling
	38 Rigidity and lag in muscular movements and reactions
	39 Fading and increase in cycles of the sound of operator's voice (like radio station fading in and out)
	40 Control of organic body functions (heart beat, blood pressure, digestion, etc.)
	41 Recall of lost memories (hypermnesia)
	42 Age regression
	43 Positive visual hallucinations; posthypnotic
	44 Negative visual hallucinations; posthypnotic
	45 Positive auditory hallucinations; posthypnotic
	46 Negative auditory hallucinations; posthypnotic
	47 Stimulation of dreams (in trance or posthypnotic in natural sleep
	48 Hyperaesthesias
	49 Color sensations experienced

Depth		Symptoms and Phenomena Exhibited
Plenary Trance	50	Stuporous condition in which all spontaneous activity is inhibited. Somnambulism can be developed by suggestion to that effect.

Although the foregoing scale presents the different phenomena as indicative of one or another special trance level, it must be noted that in actual practice an individual who achieves, say a medium trance, does not necessarily exhibit all the symptoms or phenomena listed for the medium trance.

It will be noted from the scale that the phenomenon of posthypnotic amnesia appears as No. 21 in the Medium Trance and as No. 31 in the Deep or Somnambulistic Trance; this is the particular phenomenon to be investigated in this study.

The foregoing presentation has shown that the topic of hypnosis is controversial with regard to theory and definition. In view of this fact, a list of properties has been outlined so as to give as complete a picture of hypnosis as possible and to localize the posthypnotic amnesia; this latter characteristic of hypnosis will be discussed in the following chapter.

For purposes of this study, hypnosis will be considered as a naturally occurring phenomenon differing from both sleep and wakefulness, but having some properties of both. This state may be auto- or hetero-induced through

concentration, and it results in a modification of the physiological and psychological make-up of the individual.

In this chapter, then, a limited outline of hypnosis has been given with mention made of ancient theories and modern concepts. A presentation of the characteristics of hypnosis has led to the localisation of the particular property around which this study is centered. A working definition of hypnosis has also been suggested.

CHAPTER II

STATEMENT OF THE PROBLEM

This chapter will present definitions of amnesia and will differentiate three types of amnesia; namely, clinical, organic, and posthypnotic.

The functional inability of an individual to recall and use material that has been presented to him in some conscious past experience is usually the general meaning of amnesia. When this functional inability is due to emotional disturbances, the resulting amnesia is usually termed "clinical"; when it is due to brain damage or to other organic loss, the resulting amnesia is usually termed "organic"; otherwise it is posthypnotic amnesia.

Clark Hull, in a review of the historical development of posthypnotic amnesia, claims that it was first observed by the Marquis de Puysegur[1] in 1784. The Marquis, it is recorded, was attempting to apply mesmeric methods of "magnetizing" to a young shepherd, Victor. While most of Mesmer's patients fell into a state of convulsions, Victor, on the other hand, fell into a quiet sleep-like trance. Upon awakening from this trance, it was found that Victor could

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1 Hull,C.L., Hypnosis and Suggestibility, New York, Appleton-Century Co., 1933, p. 8-9, 416 p.

not recall anything that had happened during the trance period. Thus it eventually came about that the term "post-hypnotic amnesia" was applied to the phenomenon whereby a subject could not recall, in the waking state, some or all of the events which took place during the trance state.

When posthypnotic amnesia is general or complete, the individual remembers nothing at all upon awakening; where the individual remembers some things and forgets others, the posthypnotic amnesia is referred to as partial or specific. In this study, posthypnotic amnesia is defined as one of the observable phenomena of hypnosis and "Operative Amnesia" will refer to a certain degree of posthypnotic amnesia.

The occurrence of posthypnotic amnesia in its varying degrees has prompted much discussion with regard to its genuineness and its cause. There are, of course, many questions concerning the nature of posthypnotic amnesia which, if answered, would throw light on the nature of hypnosis itself. Since the nature of hypnosis remains an unresolved problem, one must be content with possible explanations of hypnotic amnesia as given by authorities and with observed properties as reported by clinicians and investigators.

LeCron and Bordeaux,[2] in their discussion of hypnotic phenomena, liken amnesia after trance to the amnesia after dreams. This post-dream amnesia is sometimes so complete that some individuals claim that they never dream. The discussion of these two authors includes a description of complete and partial amnesia and the statement of fact that even when there is complete amnesia, subsequent rehypnotization results in detailed recall of all events of previous trances. They also report the observation that hypnotic amnesia, partial or complete, can be dispelled by a word from the hypnotist.

Rapaport[3] uses this fact of dissolution of post-hypnotic amnesia to introduce and support his theory of the phenomenon. Rapaport supports Freud whose original contention was that "...the phenomenon of posthypnotic amnesia is similar to the process of repression". The elaboration of this concept by Rapaport almost equates posthypnotic amnesia with clinical amnesia:

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2 LeCron, L.M. and J. Bordeaux, Hypnotism Today, New York, Grune & Stratton, 1949. p. 117.

3 Rapaport, D., Emotion and Memory, New York, International University Press, 1950, p. 176.

> The fact that posthypnotic amnesia can be resolved demonstrates that the forgotten material is not lost; it is inhibited by 'emotional factors' which under certain conditions may yield to other 'emotional factors' and allow for the reappearance of the forgotten material in consciousness.[4]

This explanation of posthypnotic amnesia draws heavily from the Freudian concept of repression, which in the context of hypnosis, suffers from circularity.

Historically, the origin of psychoanalysis started with the rejection of hypnosis, but Freud used all the evidence he had gathered from the behaviour of patients under hypnosis to formulate a theory that would explain this behaviour. Thus, he named the forgetting phenomenon "repression" and since it had occurred at a level other than wakefulness, it was 'unconscious'. It follows then, that to explain posthypnotic amnesia by saying that it is similar to repression is tautological.

Rapaport's acceptance of the repression theory was based on the inclusion of emotional factors, which no doubt seemed justifiable at the time, since he made use of current theory. He cited the affective factors, as proposed by Schilder and Kauders, as being the cause of the posthypnotic amnesia. In defense and support of his own position, he quotes their paper:

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4 Rapaport, Op. Cit., p. 176.

> (...) The motive of amnesia (...) must be sought in peculiarity of content. Obviously, the hypnotised is ashamed of his infantile-masochistic adjustment and denies the hypnosis in order to conceal the adjustment. Very frequently, therefore, we find hypnotised persons indignantly denying that they have been hypnotised.[5]

This quotation from Schilder and Kauders leaves much to be explained; their explanation of posthypnotic amnesia is based on the interpretation of hypnosis as a state of "infantile-masochistic" adjustment. This is an assumption or interpretation that is not necessarily valid.

Bramwell, an ancient authority, concerned himself with a comparison of memory loss due to hypnosis and ordinary memory loss in the waking state due to, say, lapse of time. His opinion of memory loss was credited to Beaunis:

> My observations have led me to accept Beaunis' conclusion that the lost memories of hypnosis have lost this distinctive and essential characteristic; that they cannot be revived by chance association of ideas, and therefore are fundamentally different from those of the waking state.[6]

Bramwell, aware that he was only expressing an opinion, respected the oppositions to his views and, let it be said to his credit, he presented them in the same reference. He stated that Bernheim and Moll among others felt that lost memories could be restored in a number of ways,

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5 Rapaport, Op. Cit., p. 175.

6 Bramwell, M.J., Hypnotism, New York, Institute for Research in Hypnosis Publication Society, 1956, p. 105.

i.e. that posthypnotic amnesia could be dispelled through a variety of methods. These methods were claimed to be: (a) by chance association of ideas; (b) by direct association of ideas; (c) by the operator's touch; (d) by the operator's suggestion to remember, and finally (e) by the dreams of normal sleep.

A more recent account of theoretical considerations about posthypnotic amnesia is given by Dorcus.[7] He draws attention to the variables of attitude, belief and role-taking both in suggested and spontaneous amnesia. According to him, role-taking is particularly responsible for suggested amnesia, but he comes back to the same question: is the amnesia real or is the subject actively repressing material? He concludes that there is no definite answer to the problem.

Leuba,[8] in the following year, presented a critique of the role-playing theory of hypnosis in which he agreed that some of the phenomena of hypnosis may be due to possible role-playing, but he accepted amnesia as one of the genuine ones!

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7 Dorcus, R.M., Hypnosis and Its Therapeutic Applications, New York, McGraw-Hill, 1956, 313 p.

8 Leuba, C., "The Reality of Hypnotic Phenomenon: A Critique of the Role-Playing Theory of Hypnosis", in the Journal of Clinical and Experimental Hypnosis, Vol. 5, issue of 1957, p. 32-38.

Summarily, this chapter has differentiated three types of amnesia. A historical perspective of posthypnotic amnesia was outlined and this was followed by the presentation and evaluation of several theories concerning the phenomenon. The general disagreement on the topic demonstrates the need for further research.

CHAPTER III

REVIEW OF THE LITERATURE

Since this study has been planned to explore only one of the observable phenomena connected to hypnosis, this survey will cover that part of the literature concerned with "operative amnesia".

Six studies have been found that dealt with the genuineness of posthypnotic amnesia and all six used the learning process to investigate it. In the period of fifteen years (1925-1940), two opposing schools of thought on this phenomenon elaborated their research, each with its own conviction. Hull was the inspiration of Strickler, Patten and Coors, while Wells stood alone in the other camp. Young published two pertinent studies which tended to give partial support to both sides.

Before the experimental controversy arose, Wells[1] in 1923, published a descriptive account of his own observations in the use of posthypnotic amnesia. In this article he established the recognition given to posthypnotic amnesia by such former authorities as Braid, Liebeault, Bernheim, Sidis, Janet and Moll. He also reported on various instances of the

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1 Wells, W.R., "Experiments in Waking Suggestion for Instructional Purposes", in the Journal of Abnormal and Social Psychology, Vol. 18, issue of 1923, p. 389-404.

use of posthypnotic amnesia in his own experimentation with students from his classes. In every case where suggestions for posthypnotic amnesia were given, they were effective to such a degree that the subject showed complete surprise when confronted with evidence of his own behaviour produced under hypnosis.

It was Young,[2] however, who initiated the controversy with his study of 1925. His study consisted of fifteen experiments, eleven of which were devoted to a question concerned with this study: do the strictly mental functions involved in memory and perception vary consistently?

Among the conclusions drawn from this study, Young said, "(...) there is in hypnosis (at least in the somnambulistic state) greater ability to resist fatigue, to resist pain, and to recall long past events(...)"[3] and again,

> On the whole, there is no noticeable difference between the normal and hypnotic states in the ability of normal persons in the fields of sensation, perception, finer discriminations, present memory (learning and retention) or physical work which does not involve fatigue.[4]

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2 Young, P.C., "An Experimental Study of Mental and Physical Functions in the Normal and Hypnotic States", in the American Journal of Psychology, Vol. 36, issue of 1925, p. 214-232.

3 Young, Op. Cit., p. 230.

4 Young, Op. Cit., p. 231.

The same author in a follow-up study, published the following year,[5] reported on a case where the hypnotised subject was able to recover facts from early childhood which he could not touch in the waking state; and when the subject was later presented with these memories, he expressed as much interest as Young himself since, apparently, the facts were as new to the subject as to the experimenter. This presentation then led to a consideration of posthypnotic amnesia.

In his discussion of posthypnotic amnesia, he gave the position of Bramwell and Wingfield who thought posthypnotic amnesia to be a distinguishing mark of the somnambulistic state while another group, which included Bernheim and Loewenfeld, maintained that posthypnotic amnesia may or may not follow upon somnambulism. With the results from his experiment Young took his stand in the camp of the latter group.

In this study, he tried to determine (a) the amount of amnesia which occurs spontaneously from hypnosis; (b) the amount when the hypnotised subject is ordered to remember; and, (c) the amount that occurs when the hypnotised subject is ordered to forget. His discussion was centered around the scores of the somnambulistic subjects, since they were the

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5 Young, P.C., "An Experimental Study of Mental and Physical Functions in the Normal and Hypnotic States, Additional Results", in the American Journal of Psychology, Vol. 37, issue of 1926, p. 345-356.

only ones whose scores differed appreciably. The test material was made up of lists of word pairs.

Young concluded from his study that posthypnotic amnesia varied greatly with the subject, but that in any given subject, it was very doubtful whether the posthypnotic amnesia was total or complete.

His elaboration of this concept reads as follows:

> The S may not, of course, be able voluntarily to recall the events of the seance; he may not be able even to recognise them when they are rehearsed to him; but that he has retained something of them seems clear, at least in this experiment, from his giving in waking associations learned in hypnosis, and from his bettered score in relearning in waking what had been taught him in hypnosis.[6]

In 1927 and again in 1931,[7] this same investigator published a review of the literature on hypnotism in which he discussed the phenomenon of posthypnotic amnesia. He reported again on the authorities previously mentioned. Young himself discussed posthypnotic amnesia in terms of lack of recall, as different from loss of memory.

Another investigator, Strickler,[8] who was a student of Hull, published a study in 1929 which he introduced with

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6 Young, Op. Cit., p. 353.

7 Young, P.C., "A General Review of the Literature of Hypnotism", in the Psychological Bulletin, Vol. 24, issue of 1924, p. 540 et seq., and Vol. 28, issue of 1931, p. 367 et.seq.

8 Strickler, C.B., "A Quantitative Study of Post-Hypnotic Amnesia", in the Jcurnal of Abnormal and Social Psychology, Vol. 24, issue of 1929, p. 108-119.

the statement that posthypnotic amnesia was generally accepted as a distinguishing mark of the deep hypnotic trance. He went on to point out, however, that the posthypnotic amnesia could be dispelled quite easily by a word from the hypnotist, so that it was obvious that posthypnotic amnesia did not behave like ordinary forgetting, which occurred from the passage of time, nor like memory loss that was due to organic damage. Strickler concerned himself then with the questions of genuineness and profundity of posthypnotic amnesia.

He attempted to answer three specific questions:

1. For those subjects who report complete amnesia, what is the actual percentage of amnesia manifested as determined by a detailed and systematic recall?

2. As measured by the re-learning method, what per cent of amnesia is shown?

3. How does trance-learned material re-learned in the normal state behave after twenty-four hours?

Four university students were used in this study. Although circumstances did not make it possible for each of the four subjects to take the same number of tests, the total number of tests made on the four was 102, half of which were done for hypnotic amnesia, and the other half for normal forgetting of exactly parallel material.

The task of the subjects was to memorise nine nonsense names of nine respective geometric characters. These paired associates were presented visually on a memory drum in different orders to avoid a definite sequence. The learning

was continued until the subject gave correct responses for two consecutive trials of the series.

Following the trance, all subjects reported one hundred per cent amnesia for everything that had taken place during the trance period. However, testing these subjects through detailed recall, it was found that an average of three per cent recall was present, thus reducing the amnesia to ninety-seven per cent. Subtracting from this figure the normal amount of forgetting that occurred when the same procedure was followed without trance, it was found that, on the average, posthypnotic amnesia was eighty per cent operative.

Still another method was employed to measure the extent of amnesia. He scored the number of promptings required to relearn the material to the same criterion in the waking state and compared them with the number required to learn the material in the trance state, thus finding another quantitative indication of the operating amnesia. This method revealed an amnesia averaging 51.7 per cent.

Furthermore, just before the beginning of each trance learning, each subject was given direct suggestions that he would learn with special ease and rapidity. The effect of this suggestion was observed to have a marked influence, on all four subjects, on the first few trance-learned series; these were learned more rapidly than the corresponding series in the waking state.

This study by Strickler was later cited by both Rapaport and Dorcus and seems to be regarded as one of the authoritative studies on the topic of hypnotic amnesia. Well aware of the fact that he had only four subjects, he emphasized the large number of tests made, 102 in all, of which fifty-one were for amnesia and fifty-one for normal forgetting of exactly parallel material.

In his control procedure, trance was induced after the learning task and the subject was allowed "to sleep" for five minutes. The reported purpose for doing this was to equalise as far as possible any lethargy which might remain on the regular trance days. He afterwards suggested in his published paper that this procedure might not have been necessary. Since he introduced his experimental variable, the trance, into his control tests, it would seem that it was not only unnecessary, but that it could even invalidate his attempt at a controlled situation.

Apart from the faulty control procedure, the attempts at measurement of amnesia leave much to be desired. Strickler claimed to have had three indicators of amnesia:

1. the usual "loose" test of questioning the subject;
2. the number of failures to recall correct names; and,
3. the number of promptings required to relearn the series fifteen minutes later.

In reality, his assumption that 2 and 3 are separate or even different, is not necessarily valid, since prompting would be given only if there <u>is</u> failure to recall, i.e.,

2 and 3 are really the same thing under different names. Also in the light of what is now believed about hypnosis, this failure to recall, or this waiting to be prompted may very well have been a direct result of what the subject thought was expected of him.

Finally, Strickler mentioned that it was also suggested to the subjects before trance learning, that while under hypnosis, the subject would learn with special ease and rapidity (underlining ours!). This fatal step invalidates completely the whole experiment: if the suggestion took effect, then there could be no comparison with the waking state, since even within the same individual the learning ability is altered from test to test. If the suggestion took no effect (and there would be no way of knowing this once it was given), there would be no measure of what influence, positive or negative, it had upon the learning ability, the motivation, and the attitude of the subject. As evidenced by curves showing a speeding-up in trance learning during the first few series, the first happened, i.e., the suggestion took effect positively.

Strickler's quantitative measure of hypnotic amnesia prompted Patten,[9] another student of Hull, to ask if hypnotic

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9 Patten, E.F., "Does Post-Hypnotic Amnesia Apply to Practice Effects?", in the Journal of General Psychology, Vol. 7, issue of 1932, p. 196-201.

amnesia applied to practice effects. Patten used fourteen college students, giving them a mental arithmetic task of addition. His experiment was so designed that he collected comparative data from: (a) seven hypnotic subjects who added in the normal waking state for six days, then for the next six days while under hypnosis, each session being followed by verbally reported posthypnotic amnesia, and then adding again in the normal state for the final six days; and from (b) seven control subjects who added in the normal state for eighteen successive days. He concluded that posthypnotic amnesia did not apply to practice effects.

In 1933, the year after Patten's study appeared, Hull's classic book was published.[10] In the chapter devoted to posthypnotic phenomena, Hull gave a historical survey of the observation of hypnotic amnesia and organised an experimental attack on the phenomenon, relying mainly on the studies of his students Strickler, Patten and Coors.

The experimental examination of hypnotic amnesia, according to Hull, must aim at answering two basic questions, viz: (1) what memory processes are actually involved in the phenomenon, and (2) the profundity of the amnesia where it occurs.

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10 Hull, C., Hypnosis and Suggestibility, New York, Appleton-Century Crofts, 1933, 416 p.

Since recall must be tested, Hull proposed three ways in which this could be done effectively. The first method involves the use of paired associates: the one member of a pair is presented in order to determine whether or not it evokes in the subject the response originally associated with it. This method is called Simple Reinstatement.

Reinstatement by relearning, the second method, is closely related to the first, and Hull claimed that it is "delicate enought to detect memory traces which are too weak to evoke any recall whatever".[11] It involves having the subject relearn the material. The gain in time of relearning over time of original learning would indicate whether there was any retention at all.

The third method is accomplished by asking the subject upon awakening what he did during the trance. Hull pointed out that a verbal report was not always a literal reinstatement of what actually took place in the trance, i.e., the speech movements (of tongue, lips, etc.) were not repetitions of physical movements (e.g. closing a window during trance), therefore he called this method Symbolic Reinstatement.

Besides the studies of Strickler and Patten, which have already been reported, Hull cited an unpublished study

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11 Hull, Op. Cit., p. 133.

by still another of his disciples, Coors,[12] who attempted to parallel with the stylus maze the technique employed by Strickler on rote learning in an effort to determine the density of posthypnotic amnesia for the stylus maze. Coors used six subjects, and on a comparative basis with Strickler's study, found that hypnotic amnesia was operative but incomplete, averaging about forty-five per cent.

In 1940, Wells[13] published an interesting study which he prefaced with the observation that there existed a tendency to question not only the validity of clinical observations with regard to amnesia, but also the accuracy of experimental evidence from the field of hypnosis on the grounds that such observations and experiments had not been sufficiently quantitative. He then cited a quotation from Hull's book: "The post-hypnotic amnesia ordinarily met with (sic), which appears superficially to be a complete wiping out of memory, is by no means complete."[14] His next sentence gave his own position on the matter: "The present paper is a flat contradiction of the last five words quoted from Hull."[14a]

Wells used four undergraduate students as his subjects. Several series of nonsense syllables were employed

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12 Hull, Op. Cit., p. 141.

13 Wells, W.R., "The Extent and Duration of Post-Hypnotic Amnesia", in the Journal of Psychology, Vol. 9, issue of 1940, p. 137-151.

14 Wells, Op. Cit., p. 138.

14a Wells, Op. Cit., p. 138.

in this investigation, each series consisting of seven syllables. For subjects one and three, the control series was learned on the first day of the experiment, followed on the second day by tests for recognition and recall after which relearning was accomplished and, then, the hypnotic series learned while they were in the hypnotic state. In this same state, suggestions for recognition amnesia, recall amnesia, and relearning inability were given.

The other two subjects learned the hypnotic series on the first day in the normal state, then they were hypnotised and, as before, recognition amnesia, recall amnesia, and relearning inability were produced. The second day they were tested for recognition and recall, and then relearning was attempted; and, finally the control series was learned.

Wells reported that recognition amnesia and recall amnesia even when measured by relearning were both one hundred per cent complete. In addition, there was complete relearning inability. The first experiment ran for approximately one month.

Using the same subjects and the same series, another experiment was undertaken to run for one year. One of the four subjects did not return to college the following year and had to be omitted from this second experiment, but the other three, tested at intervals, showed one hundred per cent complete amnesia for recognition and recall and also

relearning inability. He claimed that his good results were "no more than one should expect to get with sufficiently good subjects by means of proper methods".[15]

In suggesting amnesia to his subjects, Wells included, "(...) until the amnesia is removed by hypnosis after about a month".[16] Now, this suggestion is tantamount to telling the individual, "just go along with this forgetting for about a month and then everything will be all right". Let it be clear, however, that it is not claimed that a role-playing situation was deliberately set up, but rather that the wording of his suggestion is not really different from a sincere request for role-playing. His second suggestion induced confusion about learning and recognition. The third suggestion was designed to inhibit learning, while the fourth suggestion was a direct command, "no spontaneous recall will occur".[17]

After these suggestions, he reported one hundred per cent amnesia! Nothing else could have been found! The second and third suggestions are subject to the same criticism previously levelled at Strickler; namely, interfering with the learning mechanism or processes; while the fourth suggestion

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15 Wells, Op. Cit., p. 150.

16 Wells, Op. Cit., p. 142.

17 Wells, Op. Cit., p. 142.

raises a moot point - what if there was spontaneous recall, would his subjects have reported it? Again from what is believed about hypnosis today, they would not have reported it, since there is a strong desire to please the hypnotist.

Summarily, then, this chapter has presented a review of the experimental studies done in the area of operative amnesia with analysis and criticism of the more important ones; and where such criticisms were justified, a final evaluation of the experiment in question was made. In the perspective of these studies, an experiment was planned and studied, as the subsequent chapters will show.

CHAPTER IV

EXPERIMENTAL DESIGN

This chapter will present the working hypothesis to be investigated, together with the procedures involved in testing the hypothesis. A description of the subjects chosen and the tools used will also be given. Finally there will be an outline of the statistical analysis to be employed.

The general hypothesis for this experiment is that posthypnotic amnesia is not operative in a subject's behaviour. This hypothesis can be rejected if it can be shown that in some cases hypnotically learned material, for which amnesia is reported, later influences further learning.

A more specific hypothesis can be presented, "In the learning of paired associates, hypnotic amnesia is not operative". To be more accurate, the working hypothesis of the present research will be:

> There is no significant difference between the learning progress of a group of somnambulists whose first learning session was made in the hypnotic state and that of a group of normal subjects whose first learning session was made in the waking state.

To check this hypothesis, a learning task was chosen and was used with an experimental and a control group. The experimental group first learned the material under hypnosis, followed by amnesia for the learning task; and then twenty-

four hours later the same material was relearned. The control group learned the same material as the experimental group, first in the normal waking state; and then twenty-four hours later the same material was relearned again in the waking state. The difference in performance within each group for first and second sessions is tested to show if there is a significant increase in learning, and subsequently the differences in performance between the two groups is also compared.

Subjects.- Since most authorities agree that one characteristic of the somnambulistic trance level is the ability to develop posthypnotic amnesia, it was decided that the experimental group would consist of somnambules. To find suitable subjects, the following procedure was adopted: To a group of volunteer students from the University of Ottawa Medical School, tests of suggestibility were given. These consisted of body sway and movement of the arms up and down inresponse to direct suggestion. Those who reacted well were seen individually and subjected to instantaneous hypnosis, muscular catalepsy and subsequent reporting of amnesia. As an attempt to follow some method in trance level, the LeCron-Bordeaux[1] Scale was used as a guide; the final ten chosen reached the level of trance phenomena as listed for

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1 Reported in Chapter I, p. 4-6.

somnambulism. These ten reported amnesia - direct questioning was used. Later, during the experimental procedure, one of the students could not return for the re-test session and therefore the experimental group was reduced to nine. Each of these subjects spent half an hour with the experimenter in trance training on the day before the actual experiment. This training period included only an induction technique and deepening suggestions, which procedure was done in order to facilitate induction and the deep trance state in the actual experimental situation.

The control group was made up of fifteen volunteer graduate students from the School of Psychology and Education at the University of Ottawa.

Tools and Procedure.- Each of the ten experimentals was seated in a comfortable chair, hypnotised and given the following instructions through a tape-recorder. The same instructions were used for all subjects:

This is an experiment in learning. I am going to repeat to you pairs of words always repeating the first word in the pair, like this:

Broken - - - - - - - - - Broken-Steadfast
Hungry - - - - - - - - - Hungry-Boastful
Perfect - - - - - - - - - Perfect-Fatigued.

What I want you to do is to learn these pairs off by heart so that as soon as I give you the first word in a pair, you can immediately give me the second. For instance, if the pair of words is "Perfect-Fatigued", I shall say "Perfect"

and then after a short interval repeat "Perfect", together with "Fatigued", like this: Perfect ------- Perfect-Fatigued. What I want you to do is to say "Fatigued" out loud during this interval, so that when you have learned it, it will sound like this:

My voice "Perfect" Your voice "Fatigued" My voice "Perfect-Fatigued".
" "Hungry" " "Boastful" " "Hungry-Boastful".
" "Broken" " "Steadfast" " "Broken-Steadfast".

If you can't remember exactly what the second word is in any pair, then take a guess at it anyway. Now there is one other thing, I shall be reading out the list of word pairs several times, but each time the pairs will be in a different order; so don't be surprised or confused when the pairs come up in a different order in the second and subsequent times. Do you understand? If you have any questions, please ask them now, as I don't want you to ask anything once the experiment is in progress.

Following these, the list was then presented. Seven stimuli and seven responses were chosen from the selection of disyllabic adjectives provided by Hilgard:[2]

Absent	Modern
Formal	Utmost
Timid	Single
Complex	Proper
Lawful	Human
Recent	Jagged
Bearded	Vacant

The number seven was chosen as an estimate of a span outside the ordinary memory span. It is generally felt that below five sets, the list is too easily learned and beyond ten the list often proves to be too long where time is important. Seven was arbitrarily decided upon as a happy medium.[3]

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2 Hilgard, E.R., "Methods and Procedure in the Study of Learning", Chapter 15, in S.S. Stevens, (ed.). Handbook of Experimental Psychology, New York, Wiley & Sons, 1951, 1436 p.

3 McGeoch, J.A., The Psychology of Human Learning, New York, Longmans, Green & Co., 1950, p. 176.

The stimulus was given and then four seconds later this adjective was repeated together with the response. Four seconds later the second stimulus was given and so on to the end of the list. The order of presentation was randomised by means of Latin Squares. Eight seconds elapsed between the end of one trial and the beginning of the next trial.

The first session with the E Group was under hypnosis; this was followed by the suggestion to forget what had transpired, so as to cover the situation of amnesia as much as possible. The following day, the E Group was again seen individually, and in the ordinary waking state, given the same instructions in the same room under the same conditions.

The control group received the same instructions under the same conditions, except that for nosession was hypnosis used.

Statistical Analysis.- This analysis will contain two distinct operations. Firstly the assumption that there is no significant difference in the learning abilities of the two groups will be tested. This will be done by comparing the group means for the first sessions.

Secondly, the significance of the difference between the differences of their mean scores for the two sessions will

be evaluated using the following formula:[4]

$$t = \frac{M_{D_1} \quad M_{D_2}}{\sqrt{\frac{2}{6}\left(M_{D_1}^2 + M_{D_2}^2\right)}}$$

The value of this ratio should enable us to answer the question suggested by the working hypothesis of this study.

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4 Dayhaw, L.T., Manuel de Statistique, Ottawa, Editions l'Universite d'Ottawa, 1958, p. 342.

CHAPTER V

RESULTS, DISCUSSION AND CONCLUSION

This chapter will present an analysis of the statistical data obtained and an evaluation of the statistical evidence in relation to past evidence. There will also be an attempt at clarification of the present status of the problem, together with suggestions for further research.

Having performed all the necessary statistical operations, the results obtained are presented in tabular form on the next page. From this table, it can be seen that no significant difference was found between the mean scores of the groups for their first learning sessions. It can also be seen from the same table that each group showed a significant increase in learning on the second session.

Before going into an interpretation of the results, it would seem necessary to compare the format of this study with previous investigations. Firstly, all previous studies "interfered" with the learning process by suggesting under hypnosis better performance and the like. This study avoided that mistake.

In the training period for the hypnotic group, nothing was explained to them beyond the fact that they would be hypnotised and asked "to perform a certain task" while under hypnosis. They were assured that after the experiment was

Table I.-

The Mean Trials[a] for the Two Groups with Standard Deviations, Standard Errors of Differences Between Means and Respective t-Values.

		1st Administration	2nd Administration	Differences	t_{1-2}
Experimentals	Mean	8.66	2.33	6.33	5.27
	S.D.	4.3	1.1	4.16	
	$S.E._{diff.}$	1.1	0.3	1.1	
Controls	Mean	10.4	2.9	7.5	5.77
	S.D.	3.4	1.4	4.17	
	$S.E._{diff.}$	1.2	0.5	1.5	
	t_{E-C}	1.1		0.7	

a A Trial is an administration of a complete list of paired associates.

over, its purpose would be explained to them. In this way, an attempt was made to avoid sympathetic subjects developing a feigned amnesia in order to please the hypnotist and make the experiment work. No suggestion about increase or ease of learning ability was given.

Since no suggestions were given to the experimental group which would tend to interfere with the learning ability or process, they are performing at the same level as they would in the waking state. This is supported by the evidence from 1925 in Young's study already quoted[1] to 1958 in a paper by Uhr.[2] The evidence shows that unless suggestions are given, there is no difference between the hypnotic and waking performance and even where suggestions are given, the effect is questionable.

This fact is used as the basis for the statistical comparison of the group means for the first session. It will be recalled that this comparison yielded no difference and this is interpreted here as supporting the assumption that there was no difference between the groups in learning ability.

The significant increase found within each group from the first to the second session will be interpreted to mean

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1 Reported in Chapter 3, p.16.

2 Uhr, L., "Learning Under Hypnosis: What do We Know? What Should We Know?", in the Journal of Clinical and Experimental Hypnosis, Vol. 6, issue of 1958, p. 121-135.

that the second session was not a totally new learning situation for either group and that the relearning improvement was due to retention from the first session.

A further comparison of these relearning improvements, as shown in Table I, indicates that they are no different from each other since no significant difference was found between the gains of the two groups.

If hypnotic amnesia were operative, either there would be no significant increase in the second session of the hypnotic group, or if there is one, it would be significantly less than that of the normal group.

Neither of these conditions is present in the obtained results and therefore the working hypothesis will not be rejected. The general hypothesis that hypnotic amnesia is operative will therefore be rejected.

These results are not essentially different from the majority of those already reported in Chapter III, but this study was done differently and, it is felt, avoided the procedural errors made in the past. There is an attempt at better controls and there is a larger number of subjects used.

How does the problem now stand? The results from this experiment can be interpreted to show that material learned is not forgotten to the extent where it ceases to operate or is out of the reach of the learner; however, the significant fact is still that all the subjects reported

that they did not remember, and exhibited behaviour in keeping with their verbal report.

The paradox in the clinical situation may be translated thus: having gone through an experience, the patient after hypnosis not only reports "no experience", but also acts on "no experience". In other words, hypnotic amnesia is still operative, to some extent, for the patient since it affects his behaviour; and in a clinical setting, one is always dealing with the behaviour of a patient.

The most important use of hypnosis is, at present, its clinical application. Even the experimentalists will agree that their controlled scrutiny of the phenomenon has its strongest impact on the clinician who puts into practice the reported findings.

It was with this aspect in mind that the present study was undertaken. No formal references can be given for the fact that many clinicians make use of the amnesia phenomenon in therapeutic sessions. This fact is gleaned mainly through personal discussion with other hypnotists at conventions and invariably the manner in which posthypnotic amnesia is used is somewhat along these lines: the therapist usually is able to question or regress the patient so that some traumatic experience is revealed under hypnosis. The hypnotic reliving of a past experience is not necessarily synonymous with therapeutic abreaction which takes place in the waking

state when that patient is not as dependent upon the therapist as he is while under hypnosis. Therefore as a precaution against emotional crisis in the waking state resulting from reliving a traumatic experience under the protection of hypnosis, the therapist often suggests amnesia, and wakes the patient up, fully confident that he, the patient, remembers nothing of the session!

Here, at this point, lies the main contribution of this study: the patient may report that he does not remember and may act as if he really does not, but the knowledge of what occurred is subliminally near to consciousness and can appear as the needs of the individual demand. Clinical practitioners would be well-advised, then, to "take it easy" with uncovering of too much material at one session, since this may very well be one of the causes of resistance to induction at the subsequent session.

A word on this resistance to induction at a subsequent session - it has been often asked at conventions and seminars on hypnosis why it is that after an excellent trance the very first time, the subject fails to enter a trance upon his return to the office the following week? If during the first session, too much traumatic material was brought to the surface of consciousness, thereby rendering the defenses of the individual inadequate, the individual, in order to maintain stability, will have to create a new defense, i.e.,

refuse to go into the hypnotic state, in which state he is being forced to look at or relive things he either dislikes or fears.

The therapist may be belabouring under the false assumption that amnesia for the first session took care of that difficulty, whereas in reality, the amnesia is only affecting the outward behaviour of the patient and not the actual recollection of the trance events.

Another misuse of the amnesia phenomenon often occurs in the laboratory: a subject is hypnotised, given a certain task for which amnesia is created, and then in the waking state given the same task under the assumption that it is actually a new situation - and the comparison is often reported as valid experimentally. The present study's contribution in the field of experimental hypnosis is a similar warning to experimentalists that hypnotic amnesia does not operate in the way it appears to the onlooker, or even to the subject himself!

Among the suggestions for further research, it could be proposed that the operation of this phenomenon may be investigated for more complex types of learning, e.g., problem solving.

Another avenue of investigation could pursue the relative strength of needs, that is to say, knowing that certain

material is dormant in consciousness, under what conditions can it be forced to appear in the normal waking state? For example, if a somnambule is trained to develop complete post-hypnotic amnesia and information concerning the whereabouts of food is given under trance, suggesting afterwards amnesia for this knowledge; later on in the waking state, he is allowed to starve, how long will it be and under what other conditions will his need for food elicit the dormant knowledge? This would be also an excellent method of setting up an experimental conflict which would have no ill-effects.

This final chapter, then, has discussed the results of the present study with applications for the findings in the clinic and in the laboratory being proposed. Suggestions for further research have also been given.

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APPENDIX 1

ABSTRACT OF

An Investigation of Hypnotic Amnesia[1]

Within the complex of hypnosis, the property of post-hypnotic amnesia remains a distinguishing factor of the deep trance state. Theories proposed to explain this posthypnotic amnesia include the Repression concept of Freud, later supported by Rapaport. Bramwell viewed hypnotic memory as being essentially different from waking memory; while Dorcus emphasized the role-playing attitude of the subject who tries to please the hypnotist.

Six studies were found that dealt with the investigation of the phenomenon of posthypnotic amnesia. Each of them used the learning process in his respective study. Each also made the same procedural errors of suggesting under hypnosis improved learning ability, thus introducing another variable into the experimental situation.

This study used a larger number of subjects than any of the previous ones and avoided the technical pitfalls to which the others succumbed. A learning task was also employed in this study; it consisted of seven pairs of adjectives.

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1 Gordon A. Bissessar, dissertation presented to the School of Psychology and Education of the University of Ottawa, Ontario, May 1961, i-48 p.

The results of this investigation indicated that hypnotically learned material is not forgotten to the extent where it ceases to operate or is out of the conscious reach of the learner. Because of this, a word of caution has been extended to both the clinician and the experimenter. Suggestions for further research include the investigation of the phenomenon by more complex learning tasks such as problem solving, and the investigation of the relative strengths of needs.