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V. MEMORY LOSS FOLLOWING ELECTRIC CONVULSIVE TREATMENTS

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I shall present a brief report on some of the findings derived from a research study designed to determine psychological changes following an entire series of electroconvulsive treatments (ECT).[1] One of the main problems investigated was memory loss. It has been generally observed that extensive amnesias occur among mental patients during the period when electroshock treatments are being administered, but many authorities claim that such amnesias clear up within the first two to three weeks after the termination of treatment, during which period the confusion, the temporary intellectual impairment, and other transient "organic" effects of ECT undergo rapid recovery. Do the amnesias clear up completely during the usual recovery period? After the "organic" syndrome disappears, is the patient left with any residual impairment of recall functions?

In order to investigate this problem systematically, intensive interviews were conducted before and after the series of electroshock treatments. There were nineteen patients in the electroshock group, representing a cross-section of patients who received ECT in the two psychiatric hospitals where the study was carried out. An equated control group of 11 patients in the same hospitals was also included in the study. Each group contained several neurotics and a fair number of borderline schizophrenics as well as some manifestly psychotic patients. The patients in the electroshock group received a minimum of eight convulsive treatments spaced three times a week.

Shortly before the first electroshock treatment a standardized interview was given in which a wide range of personal memories was elicited, covering school experiences, job history, family problems, details about the onset and development of the mental disorder,

[1] A full report on the research study will appear in the near future in a series of three articles in the *Journal of Nervous and Mental Diseases.*

and so on. A posttreatment interview was administered approximately four weeks after the termination of ECT and was designed to test the ability of the patient to recall the material he had been able to recall prior to treatment. General questions were asked at first, and, if these failed to elicit recall, more and more specific ones containing memory cues were given. As a last resort, the patient was given a recognition test (with the permission of the psychiatrist in charge of the case). This usually consisted of reading to the patient a fair portion of his former response to see if he could then remember the experience and recall the additional details about it.

It was found that every one of the 19 patients in the electroshock group displayed definite retroactive amnesias, as of approximately four weeks after the termination of ECT. For each case it was possible to verify many of the forgotten events as actual occurrences, on the basis of independent sources of information in the patient's case history records. Many of the patients were unable to recall from 10 to 20 life experiences which had been available to recall prior to electroshock treatments.

In contrast, the patients in the control group were able to recall practically every detail about their past experiences which had been elicited in the earlier interview. The control patients had been given exactly the same kind of interviews as the pre- and post-treatment interviews of the ECT patients, with approximately the same time interval between, but had received no form of shock treatment during the intervening period.

The results show, therefore, that electric convulsive treatments, as administered in standard psychiatric practice, produce amnesias which do not clear up within four weeks after the termination of treatments. One of the important characteristics of the amnesias is that they are circumscribed memory gaps. Often the patients are able to remember things that happened immediately before and immediately after the forgotten event. Sometimes a patient will deny that a given event or series of events has occurred, and he will fill in the amnesic gap, as in the following example. The patient, a 37-year-old borderline schizophrenic, reported in the pretreatment interview that he had been unable to work for several months before coming to the hospital, during which period he would spend his time riding

around in subways, wandering about the city, sitting in churches, etc. (These facts were confirmed by information from members of the family in the patient's case history record.) Four weeks after a series of 12 electroshock treatments, the patient was unable to recall this period of unemployment and claimed: "I worked right up till I came to this hospital." After many detailed questions, the patient was finally told about his former statement and he replied: "I don't recall that. My wife would know because she has to take care of the bills. You could ask her. It might have been for a few days. . . . There are some things I can't remember. But I think I did support the family right up till I came to the hospital."

It should be mentioned that the amnesias are by no means limited to events of the recent past, although experiences during the six months prior to treatment are more likely to be forgotten than those which had occurred in earlier periods. Occasionally the amnesias involve events of early childhood that date back from 20 to 40 years.

From the content of the forgotten material, it appears likely that the amnesias are selectively determined. Suicide attempts, visits to psychiatrists, disturbed episodes leading to hospitalization and similar features of the patient's psychiatric history are more likely to be forgotten than other types of past experiences.

For five of the ECT cases it was possible to carry out a follow-up study, for the purpose of obtaining some preliminary information on the persistence of posttreatment amnesias. These cases were re-examined from two and one-half to three and one-half months after the termination of ECT. It was found that the patients were still amnesic for almost all of the personal experiences which they had been unable to recall in the earlier posttreatment interview. This finding reinforces the conclusion that the post-ECT amnesias persist well beyond the usual period during which there is recovery from the transient "organic" effects of ECT. This conclusion, of course, applies only to a standard series of electroshock treatments, as they are currently administered in psychiatric hospitals. It is quite possible that modifications of ECT technique (the use of unidirectional current rather than alternating current, a shorter series, a wider spacing of treatments, etc.) may not have the same effect.

It should be mentioned that in each of the five cases investigated

in the follow-up study, there were one or two instances of partial or complete recovery of amnesic material. This evidence, as well as other observations, implies that the memory loss is not an irreversible one. The diffuse amnesias of the treatment period apparently clear up rapidly but the patient is left with amnesic gaps which appear to be due to subtle motivational factors rather than to a permanent retention loss.

At this point I should like to mention some of the observations made in the course of a concurrent investigation which tie in with the findings on posttreatment amnesias. As part of the research study on psychological effects of ECT, changes in emotional or affective disturbances were investigated by means of self-rating scales administered in a personal interview. In a number of cases it appeared that there was a very close relationship between the reduction of disturbing affect produced by ECT and the occurrence of the post-ECT amnesias.

For example, one patient no longer felt disturbed and hopeless about his physical condition after ECT; but, in addition, he could not remember having had the queer and sometimes painful somatic sensations about which he had complained so bitterly in responding to the pretreatment questionnaire. Another patient who displayed the typical decrease in self-aggressive affective attitudes following ECT had become amnesic for various sexual experiences which, in the pretreatment session, she had frequently referred to as a major source of her intense guilt feelings.

Observations of this sort strongly suggest that there may be a causal connection between the post-ECT amnesias and the affective changes produced by the treatments. This point raises the possibility that the posttreatment amnesias may involve a repression mechanism which plays at least a secondary role in maintaining whatever clinical improvement is achieved by the organic changes produced by electric convulsive treatments.