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Effect of Metrazol on Recent Learning.

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One of the theories attempting to explain the mechanism of metrazol treatment in the psychoses is that a noxious or destructive effect is exerted on the central nervous system so that the mental symptoms, affecting neural processes of the highest order (largely cortical), and also of most recent origin, are the most vulnerable and hence the first to disappear. In order to further test the validity of this concept we attempted to establish a neural pattern of recent origin and see if it could be abolished by the administration of metrazol.

The demonstration required the establishment of new learnings of a fairly high order which were amenable to objective experimental control, observation and measurement. The code transcription procedure was chosen as a simple technic which would satisfy these criteria.

The following routine was observed for the experiments: After preliminary explanations and demonstration, the patient was asked to transcribe from memory the nonsense syllable code in the appropriate blank spaces as rapidly as possible. He worked 4 minutes; his score was the number of items transcribed. After 2 minutes' rest he was given 6 minutes of practice at transcription. Then followed another 2-minute rest interval and a 4-minute retest. The number of items transcribed in this latter period constitute the "Retest 1" score. During the week following Retest 1, two or 3 metrazol injections were administered. At the end of the week another 4-minute retest was given; the number of items transcribed constitute the results of Retest 2. By comparing the scores made on Retest 1 and 2, any change in the patient's performance could be determined.

An alternate and comparable form of the code transcription test was used on the same patients (Control I). In these control experiments the patients were subjected to the same procedure, but during the period of forgetting no metrazol injections were given. The tests were also given to a control group not receiving metrazol. (Control II).

This report is based on 6 patients and 6 controls. All were young or middle-aged adults. The cases included 2 of chronic encephalitis; one of depression of the manic depressive psychosis;

one involutional melancholia and 2 schizophrenics. Included in the controls were 4 normals, one chronic encephalitis and one recovered hypo-manic (manic depressive psychosis). Every effort was made to keep the experimental conditions constant. Patients with disturbing mental symptoms were not studied, the subjects used being selected on the basis of their ability to coöperate. The factor of attention was more or less uniform throughout the test periods as far as could be ascertained. The test results for 3 patients who received control tests both before and after treatment showed no significant difference from the others of the group.

Since the individuals responded in a fairly uniform manner a short tabular summary of the average results in each group is submitted:

Average difference in scores of Retests 1 and 2:

Metrazol cases	—25.1%	27.8% difference
Control I	+ 2.7%	
Control II	+ 3.5%	28.6% "

The data show that performance of the code transcription after metrazol injection resulted in a score of 27.8% lower than control tests on these same patients. The control subjects (Control II), those not receiving metrazol, showed no mean loss at all, but a small mean gain of 3.5% after the lapse of the time interval.

Although the series is small, the results are statistically reliable. The impairment in learning with metrazol would appear to be due to impaired memory. A number of factors entered into the learning procedure. The question of impairment of attention as against impairment of memory is being given further study.

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Isolation of Antibody from Agglutinate of Type I Pneumococcus by Treatment with Acid.

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In previous reports from this laboratory[1, 2] it has been shown that the liberation of antibody from immune precipitate of Type I Pneu-

1 Liu, S. C., and Wu, H., *Chinese J. Physiol.*, 1938, **13**, 449.

2 Liu, S. C., and Wu, H., PROC. SOC. EXP. BIOL. AND MED., 1939, **41**, 144.