Experimentally Induced Restricted Paramnesias

THE phenomenon of *déjà vu* has attracted considerable attention from time to time, but no attempt has hitherto been made to subject it to experimental scrutiny. In the course of an investigation of paramnesia, however, we have succeeded in inducing by experimental means states of consciousness virtually identical with this phenomenon. We have further shown that the familiar paramnesias of daily life may be artificially duplicated under the conditions of the laboratory.

Our method was briefly as follows: On the first day of the experiment, coloured postcards and olfactory stimuli were presented to the subject in the waking state. On the following day he was hypnotized, and other similar material presented. Concurrently, suggestions were given to the effect that he would forget all about the latter and be totally unable to recognize it after awakening. In other words, a selective post-hypnotic amnesia was induced. On the third day, the subject was given a recognition test in the waking state. This involved re-presentation of all the items which had been given on the preceding two days together with other similar cards and odours. The subject, an undergraduate student of psychology entirely ignorant of the purpose of the experiment, was instructed to describe his reactions as fully as possible.

Our results clearly prove that restricted paramnesias may be induced by experimental means. The stimuli presented during hypnosis gave rise in every case to a condition virtually identical with localized

déjà vu. They invariably initiated powerful feelings of familiarity, and these, in their turn, seemed to compel the subject to seek an explanation of the familiarity in terms of concrete past experience. He was generally able to relate the material to some experience, or combination of experiences, in his past history; but in no case did he suggest that there might be a connexion between the experiences of familiarity and the events of hypnosis. His explanations can thus be treated as examples of constructive rationalization.

We may conclude that the impression of familiarity typically arises under conditions in which a cognitive reaction between present and past experience cannot be subjected to introspective scrutiny. It carries with it a powerful tendency to recall the antecedent experience and thereby to render the recognition more explicit. Under conditions in which this cannot be accomplished, the subject is liable to accept a purely constructive interpretation as the basis of the experienced familiarity. Our results are thus in line with the views of MacCurdy¹ and others who seek an explanation of *déjà vu* in the activation of an unconscious cognitive process. It is hoped that further investigation will enable us to evaluate more fully the significance of these results for general psychological theory.

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¹ MacCurdy, J. T., "The Psychology of Emotion", Chap. 43. (London: Kegan Paul, etc., 1925.)

Points from Foregoing Letters

SIR ARTHUR EDDINGTON attributes the failure of current quantum theory at short ranges and high energies to its neglect of the uncertainty of position and momentum of the physical origin from which the observables are measured. The mesotron introduced in theoretical studies of the nucleus appears to be identical with the mass m_0 (10/136 of the mass of a hydrogen atom) already used in extra-nuclear investigation to represent the uncertain momentum of the origin. The range of nuclear forces directly represents the uncertainty of position.

Dr. E. T. S. Appleyard, J. R. Bristow and Dr. H. London report measurements of the critical magnetic fields for thin superconducting mercury films. The ratio of the critical field for a film of given thickness to that of bulk mercury at the same temperature increases steeply as the transition point is approached; from this it is inferred that the field penetration into a superconductor is not constant but likewise increases rapidly close to the transition point. The value of the penetration depth at 2.5° K. is estimated to be 1.2×10^{-5} cm.

Dr. D. Shoenberg finds that the diamagnetic moment per unit volume of a superconducting particle in a mercury colloid is less than that of a large sphere in the same field, and decreases with increasing temperature, just where the ratio of the critical field to that of the bulk metal increases. This is interpreted as due to an appreciable penetration of the field into the small particles, the penetration depth increasing with temperature. The effects were most marked in a colloid of particle size of order 10^{-5} cm.

According to a recent theory of the origin of the cosmic radiation, this must contain electrons and atomic nuclei. It is pointed out by Dr. H. Alfvén that the nuclei might be stopped in the upper atmosphere through production of mesotrons.

On some occasions when a thixotropic paste is vigorously shaken in a glass tube, G. W. Cowdrey and M. L. Smith find that the end of the latter has burst outwards. Different tubes when burst in this manner exhibit striking similarity of fracture. An explanation based on the phenomenon of thixotropy is suggested.

It is reported by Dr. F. Lipmann that pyruvic acid oxidation in *Bacterium Delbrückii* is catalysed by the combined action of two enzymes, with vitamin B₁, pyrophosphate and a flavin compound as the respective prosthetic groups.

Cancer tissue from the mouse, cultivated for twelve years *in vitro*, still retains its original malignant properties, according to Prof. A. Fischer and Fanja Davidsohn. The carcinoma cells remain mouse cells besides retaining the properties of cancer cells, although they have been grown on a foreign medium (chick and rat plasma and embryonic tissue juice of chick).

An experimental attack is being made on the problems of paramnesia by means of hypnosis, by Dr. H. Banister and O. L. Zangwill. Picture postcards and odours, presented to the subject under hypnosis, later give rise to strong feelings of familiarity, apparently identical with localized *déjà vu*.