acid in the blood suggested by Benni, Schersten, and Östberg[3] gives low and unreliable results because it compares a tube containing a high concentration of Na and Ca with one in which no salts are present and without reference to the "critical" point. The presence of Na, Ca, or hexose di-phosphate alters the time required for decolorization but does not change the least amount of citrate necessary for maximum speed of decolorization. By increasing the sensitivity of the method through use of a smaller concentration of methylene blue, the effect of these substances is avoided.

Oxalic acid in concentrations 3 times that required to prevent coagulation increases the amount of citrate necessary for maximum speed of decolorization. Oxalates therefore can not be used as anticoagulants if plasma citrate is to be determined by this method.

Preliminary experiments on rabbits showed that the citric acid content of the serum dropped very markedly during a 3-day fast, and that the administration of $NaHCO_3$ to fasting rabbits increased the serum citrate.

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The Psychopathological Effect of Sodium Amytal.

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Isoamylethylbarbiturate was introduced into psychiatry by Lorenz and Bleckwenn in 1929. It was recommended to produce profound sleep which in certain neuropsychiatric patients was followed by peculiar changes in behavior. Lucid intervals with good contact and almost complete insight were produced in certain cases of catatonic dementia precox. Depressed or excited patients had periods of calmness and contentment. In some cases, improvement, in others a rapid recovery followed the repeated induction of sodium amytal narcosis.

We conducted experiments guided by the assumption that the striking changes following sodium amytal administration cannot be sufficiently explained on the basis of the narcosis produced. We studied the drug action, therefore, in very small doses not leading to any narcosis or sleep at all. In examining patients' responses as compared with the observations by the authors mentioned above we found that after the injection of less than half of the dose used by

[3] Benni, Schersten, and Östberg, *Biochem. Z.*, 1930, **223**, 443.

Bleckwenn, when no signs of narcosis could be observed, there nevertheless was a striking change in the patient's behavior similar to the change described as the result of narcosis. This led us to a more systematic investigation of the effect of sodium amytal, particularly since such small doses are void of all the disadvantages and dangers involved in any prolonged narcosis.

It seemed indispensable to study the effect of the same doses as used in psychotic patients with normal individuals. Sodium amytal crystals dissolved in distilled water to a 1 gr./1 cc. solution were injected intravenously. One grain was injected during the period of a minute. The injection was stopped as soon as the patient showed the first signs of psychological change. The administration of 3 to 4½ grains was sufficient to produce the change which we wanted to study. Twenty-four patients and 4 normal individuals were used as subjects. The normal individuals were one staff member of our hospital and 3 graduate students accustomed to making introspections. In all subjects we found certain neurological changes, such as speech defects of the paretic type, nystagmus, a disturbance of eye muscle coordination, and a mild degree of ataxia. There was also an increase in the threshold for pain stimuli as well as for smell and taste stimulation. There was the objective appearance of mild fatigue without any subjective signs of it.

The psychological changes in normal individuals were characterized by a feeling of serenity and well-being, a desire to communicate and to speak about problems of personal matters usually not spoken of to strangers. There was also the feeling of being unable to guard against saying things which one does not want to and an inability to refuse to answer questions even if they refer to very intimate matters. There was a feeling of increased physical and mental abilities but no objective increase in psychomotor activities.

The subject's objective behavior was friendly, amiable, emotionally warm, sometimes sentimental, combined with a certain distractibility and lack of power or willingness to stick to the subject of conversation. As a whole, the picture was of mild euphoria with rapid flow of associations but no increase in psychomotor activities.

The patients belonged to the schizophrenic, cyclothymic, and psychoneurotic group. The outstanding change was an increase in ability or willingness to communicate thought content and memories. Catatonic patients who had been mute for months became communicative and gave valuable material about their trends of thought. Depressed patients told about subjective reasons for their feelings of guilt. The psychomotor activity in psychotic

patients showed a marked change in the direction of metrokinetic behavior. Catatonic patients lost their rigidity and their cataleptic symptoms. Patients with agitated depressions became quiet. Hyperkinetic depressions were changed to normal states of motor activity.

The mood appeared indifferent or mildly euphoric. Anxiety and apprehension gave place to mild indifference with a tendency to joke. In no case did we find a change in the essential structure of the systems of delusions and of perceptive distortions.

Our studies show that sleep and narcosis are not necessary conditions for the production of the mental changes discovered by previous authors as the result of sodium amytal injection. In normal individuals the drug produces a mild euphoria and a release in inhibitions and reserve which usually prohibit the individual from communicating about matters of emotional significance. The same mechanism seems to be at work in psychotic patients where it makes possible communications of the thought content, inaccessible to the usual means of clinical approach. The value of the method described above for diagnosis and for psychopathological investigation of psychiatric conditions seems to be established. The effect of sodium amytal in this respect is similar to that of cocaine which was used by Berger in Germany. Amytal is to be preferred because it does not seem to have any undesired concomitant effects. The therapeutic influence of the drug does not seem to be specific. It allows a period of emotional rapport with the patient and gives access to thought material which can be utilized for subsequent psychotherapeutic efforts.

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Exchange of Oestrin and Corpus Luteum Hormones in Parabiotic Female Rats.*

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In a previous paper the author has described a method for testing the amount of blood exchange in parabiotic rats.[1] A large series

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[1] Hill, Robert T., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 592.