SOME OBSERVATIONS ON SODIUM AMYTAL EXPERIMENTS.

PRELIMINARY REPORT.

By F. REITMANN, M.D.Vienna.

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I.

SODIUM amytal (sodium-isoamylethylbarbituric acid) has been used in psychiatry for several purposes; its uses in producing lucid intervals in catatonia are acknowledged (Bleckwenn). Broder employed it for the first time in continuous narcosis; and later, in combination with caffeine, he used it for therapeutic purposes in the treatment of psychoses; Harris, Horowitz and Milch discovered its prognostic value in insulin and cardiazol therapy, and Hermann, its effects in clearing psychogenic amnesias. It gradually lost its interest from the research point of view because sodium amytal (S.A.) appeared to be similar in results to ordinary hypnosis, but in the course of our own observations we found definite differences between the two.

II.

We always used S.A. for hypnosis under constant conditions—the patient took up a comfortable position in a darkened room. Before the experiment was made, a thorough physical and mental examination was carried out, and during hypnosis the usual precautions were taken (permanent blood-pressure control kept, etc.). Not more than 10 gr. of 10 per cent. solution of S.A. were used, and the reactions of the patient under hypno-analysis were carefully observed. Should the answers be unsatisfactory or the medium be inclined to become comatose, 1·5 c.c. of 10 per cent. cardiazol were injected intravenously,* after which the examination was continued for 10–15 minutes, when it was found that in 90 per cent. of the cases under observation, replies became clearer and more interesting—only about 10 per cent. reacted to the cardiazol by full interruption of the hypnosis. During the next 25 minutes, 10 per cent. caffeine sodio-benzoate was applied hypodermically, and occasionally a further 2 c.c. cardiazol. The patient later had some strong tea and left the room fully recovered. Following hypnosis the blood pressure recovered to normal in about a quarter of an hour. No complications such as shock, alarming swelling of the tongue or pneumonia occurred. From the physical point of view one case-note will illustrate the rest:

* This modification of the experiment was used in only 50 per cent. of the cases treated.

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CASE No. 7.—T. W— (female) : B.P. 135/85, P. 72, R. 18. 10 a.m. S.A. begun ; 10.2 a.m. 2 c.c. S.A. injected and hypno-analysis begun. 10.5 a.m. injections completed ; total 7½ gr. S.A. B.P. 100/75, P. 65, R. 15. 10.10 a.m. hypno-analysis continued—slight perspiration; no swelling of the tongue. B.P. 100/75, P. 65, R. 16. 10.16 a.m. answers coming with difficulty. B.P., P., R., as before. 10.20 a.m. 1·5 c.c. cardiazol injected intravenously. 10.22 a.m. B.P. 115/80, P. 68, R. 17. Answers stimulated. 10.45 a.m. 1 c.c. caffeine injected hypodermically. 10.47 a.m. 1·5 c.c. cardiazol injected intravenously. Patient is now quite alert, but still feels slightly sleepy. B.P. 125/80, P. 70, R. 18. 10.58 a.m. patient given tea ; changes lying position. S.A. examination over ; patient talks sleepily with the nurse ; 11.00 a.m. patient leaves the Examination Room feeling slightly dizzy, but otherwise all right. She shows partial amnesia towards the hypno-analysis, which does not clear up later.

In the course of the experiments we carried out various physiological investigations ; the complete blood count was repeated at 5-minute intervals, but showed no changes. With the exception of those cases where cardiazol was given, the following controls all refer to S.A. experiments without cardiazol. The blood urea (Archer and Robb method) revealed no changes ; the serum chlorides, such as NaCl, were slightly increased in six cases under S.A. ; slightly decreased in three, and no change was observed in two. In 15 cases definite and characteristic changes were found in the blood-sugar curve (Folin-Wu method), *which rose about* 30 *mgm. per cent. and fell slowly to normal level within* 25 *minutes of the S.A. injection being given.* The varied material used—e.g. different sex, diagnosis and constitutional make-up—insured that this reaction was entirely due to the effects of S.A. and not to the individuals under treatment. A control experiment with physiological Ringer solution (without

TABLE I.—*Showing in Detail the Laboratory Investigations carried out on one case.*

Mrs. E—. Paraphrenia. 7½ gr. S.A. given.

	Time.	Blood sugar. mgm. %.	Blood urea. mgm. %.	Blood chlorides. mgm. %.	Blood counts. Total R.B.C.	Total W.B.C.	Hb %.	C.I.	Polym.	Lymph.	Eos.	Monos.	Blood pressure (systolic).
	Before	82	28	468	5,608,000	9,600	70·0	0·62	72·6	22·4	2·0	3·0	140
After.	5 min.	100	—	—	5,420,000	9,800	70·0	0·64	82·2	15·4	0·8	1·6	115
	10 min.	110	28	494	5,420,000	9,800	70·0	0·64	82·2	15·4	0·8	1·6	115
	15 min.	126	24	—	5,386,000	6,600	70·0	0·66	75·6	22·4	0·8	1·2	120
	20 min.	108	—	—	5,386,000	6,600	70·0	0·66	75·6	22·4	0·8	1·2	135
	25 min.	100	28	494	5,460,000	7,400	70·0	0·64	78·8	17·2	1·0	3·0	135
	Control. 5 c.c. "Ringer" given.												
	Before	82	28	468	5,608,000	9,600	70·0	0·62	72·6	22·4	2·0	3·0	145
After.	5 min.	80	—	—	5,300,000	6,400	70·0	0·66	70·0	25·5	2·5	2·0	140
	10 min.	80	25	460	—	—	—	—	—	—	—	—	145
	15 min.	89	—	—	5,300,000	6,400	70·0	0·66	70·0	25·5	2·5	2·0	138
	20 min.	75	—	470	—	—	—	—	—	—	—	—	140
	25 min.	82	25	468	5,600,000	9,500	70·0	0·62	73	23	1·0	3·0	140

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glucose) simulating the S.A. was carried out four days before or after the real experiment, and the blood-sugar curve in this case proved completely negative even taking into account emotional reactions. With H. Tod's statement in mind—that "hypnotics decrease the hyperglycaemic area"—we made a glucose tolerance test before, and in the course of the S.A. experiment found that three patients with a normal glucose tolerance curve produced, in the first 25 minutes of the S.A. experiment, a fall in the blood sugar of 25–30 mgm. per cent., but after this the blood-sugar curve continued normally; on the other hand, two cases showed paradoxical reactions, so that no further conclusions could be drawn. It would seem, however, that the blood-sugar changes observed must originate from functional changes in the central nervous system rather than from changes in the endocrine system.

III.

The total number of cases observed up to date, being only 30, this is of no value for statistical purposes, but we found in the course of our observations that S.A. was useful in four different ways: firstly as a psycho-therapeutic auxiliary; secondly as a rapid method of approach; thirdly, as a shock; and lastly for diagnostic purposes. In the first two of these the results were somewhat similar to those of ordinary hypnosis, but it was found that in S.A. hypnosis there was only an impersonal connection between the operator and the medium, and the patient's personal emotions not being brought into play the course of further psychological treatment was not endangered as is often the case when ordinary hypnosis is carried out. (According to the psycho-analytic school there is a close connection between the operator and medium in ordinary hypnosis. The patient sees in the former the father or mother imago and it is in this relationship that he responds.)

Giving S.A. once or twice to the same patient as a form of shock therapy, we obtained several quick recoveries. The most probable explanation of the results of this shock treatment seems to be that of Schilder, who stated that under shock therapy "the patient tries to give up the world and build it up all over again," and that "a quick regression and a new adaptation may originate."

The value of S.A. for diagnostic purposes may be illustrated by two cases in which an immediate diagnosis of situational schizophrenia was made as a result. Such cases do not usually respond to ordinary hypnosis, and it was only by means of S.A. that a quick diagnosis could be obtained.

In the course of our experiments the following general observations were made: as stated above, the patients reacted impersonally towards the operator during S.A. examination; most of them showed partial amnesia towards the hypnosis—some of them remembered everything, and only two were totally amnesic. Neither the total nor the partial amnesic reactions were found to

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have adverse after-results, e.g. the psycho-neurotics did not suffer from shock on account of repressed material being brought into consciousness too soon. Neurologically, we found that in four cases the reflexes were diminished, and in another four sucking movements of the mouth were noticed. In about 25 per cent. of the cases a marked horizontal nystagmus was present during the last part of the experiment.

IV.

Various theories have been put forward to explain the physiological mechanism of S.A. hypnosis: Hermann came to the conclusion that S.A. as a cortical depressant removes inhibitions; Lindemann made experiments with small doses of this drug on his students and found that they became talkative and sociable. It is well known, however, that small doses of alcohol work in the same way and that large doses, after causing a preliminary excitement, then act as cortical depressants. Layman states that the "removal of inhibitions appears to bring about the changes found." One should, however, bear in mind the fact that his experiments were carried out on schizophrenics only, and it is known that S.A. has a specific effect on such patients, and therefore the results of S.A. experiments on these are not comparable with those on so-called "normal experimental subjects." On account of its chemical properties there is no doubt that S.A. acts partly as a cortical depressant, and its chief effect is to remove inhibitions, but experimenting in the same way with evipan, which has similar narcotic properties, we were unable to carry out hypnosis under its influence. It may be concluded, therefore, that S.A. acts not only as a cortical depressant. As mentioned above, we found that by giving cardiazol, which is, *inter alia*, a cortical stimulant, the effects of S.A. were not interrupted, but favourably influenced. This would indicate that the latter must have other effects on the brain, for if it were only a cortical depressant its effects would be overcome by giving a cortical stimulant. No further conclusions could be drawn based on the observations carried out so far, but further research will throw light on these problems.

Summary.

(1) Physiological controls carried out in the course of our S.A. experiments revealed a definite rise in blood sugar.

(2) The impersonal attitude between operator and patient in S.A. hypnosis has been observed as opposed to the personal connection adopted in ordinary hypnosis.

(3) Observation of neurological symptoms such as horizontal nystagmus.

(4) Combination with cardiazol suggests that the effect of S.A. is not only that of a cortical depressant.

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BIBLIOGRAPHY.

BRODER (1936–37), *Amer. Journ. of Psychiat.*, **93**, 57–74.
HARRIS, HOROWITZ and MILCH (1939), *ibid.*, **96**, 327–333.
HERMANN (1938), *Psychiat. Quart.*, **12**, 734–742.
LAYMAN (1940), *Journ. Gen. Psych.*, **22**, 67–87.
LINDEMANN, quoted after Hermann.
TOD (1935), *Biochem. Journ.*, **29**, 914–918.

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