Twelve out of 14 attempts to revive animals in the late stages of adrenal insufficiency, either by intraperitoneal normal saline injections or by feeding normal saline or the Rubin-Krick salt solution were unsuccessful. In 2 cases revival was effected. These revivals were not attempted until a fall in body temperature indicated severe adrenal insufficiency, although the animals could in all probability in every case have been revived with cortical extract.

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Improved Colorimetric Method for Determination of Bromide Concentration in Blood and Cerebrospinal Fluid.

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In our previous study[1] dealing with determinations of bromide in blood and in cerebrospinal fluid it was pointed out that with the colorimetric procedure of Hauptmann[2] one cannot recover the actual amount of bromide in blood serum. According to Wuth's assumption the precipitates of blood proteins retain a certain amount of bromide.[3] However, with another method[4] for the bromide determination in which, like Wuth, we also used protein-free filtrates, we were always able to recover the total amount of bromide dissolved in various specimens of blood serum.

Having inferred from these findings that proteins are not essentially responsible for the loss of bromide, we tried out *in vitro* the effect of various blood components on the bromide determination: Dissolving, respectively, uric acid, creatinine, urea, glucose, amino-acids (glycine), lactic acid, potassium sulfate, sodium carbonate, magnesium-ammonium phosphate, potassium iodide and sodium

these when killed for autopsy showed large accessories. Forty-four (95.6%) died within 34 days; the average survival was 8 days.

In 41 animals given salt treatment for 30 days after operation, only 18 (43.9%) died during the course of treatment, the average survival being 9 days. Twenty-three animals (56.1%) were alive when the treatment was discontinued. At this writing the survival of this group, after treatment was stopped, has not been determined.

1 Katzenelbogen, S., and Goldsmith, H., *Am. J. Psych.*, 1931, **10**, 1045.

2 Hauptmann, A., *Klin. Wochnschr.*, 1925, **4**, 1629.

3 Wuth, O., *J. A. M. A.*, 1927, **88**, 2013.

4 Hastings, A. B., and van Dyke, H. B., *J. Biol. Chem.*, 1931, **92**, 24.

chloride in aqueous solutions of sodium bromide, we found that only sodium chloride influenced the results obtained with Hauptmann's colorimetric determination of bromide: The more sodium chloride added, the lighter became the color, and the less bromide was found.

On the basis of this observation we attempted to modify Hauptmann's procedure, so as to eliminate the error arising from the presence of sodium chloride. The principle of our modification consists in equalizing (as nearly as possible) the NaCl concentration in the blood serum, spinal fluid and standard before carrying out the color reaction (due to formation of gold bromide). For that purpose we used, instead of distilled water, salt solutions for the dilution of the blood serum and for the preparation of the standard. In view of the fact that the cerebrospinal fluid commonly contains considerably less bromide than the blood serum, it is used undiluted for the bromide analysis. No sodium chloride need be added to the cerebrospinal fluid because its sodium chloride concentration very nearly approaches that of our blood serum dilutions and of the standards prepared with salt solutions.

TABLE I.

Experiments with serum			Experiments with spinal fluid		
NaBr added	(1) NaBr recovered	(2) NaBr recovered	NaBr added	(1) NaBr recovered	(2) NaBr recovered
50	42.0 (—16.0)	50.5 (+1.0)	10	8.6 (—14.0)	10.2 (+2.0)
100	84.3 (—15.7)	100.0 (0)	20	17.2 (—14.0)	20.3 (+1.5)
150	126.7 (—15.7)	149.0 (—0.7)	40	33.3 (—16.7)	40.0 (0)
200	165.7 (—17.1)	197.5 (—1.3)	60	48.3 (—19.5)	58.3 (—2.8)
250	203 (—17.2)	246 (—1.6)	80	60.0 (—25.0)	80.7 (+0.9)
300	245 (—18.3)	297 (—1.0)	100	69.0 (—31.0)	103.5 (+3.5)

(1) by Hauptmann's procedure, (2) by the modified procedure.
Figures are in mg. %. Figures in ( ) are differences in %.

Table 1 shows that with the original Hauptmann's procedure losses of bromide were registered; conversely, with our modified procedure the amounts of sodium bromide dissolved in various specimens of blood serum and of cerebrospinal fluid were totally recovered.

The technique of the modified method is essentially the same as the technique previously described,[1] except for the following differences: (a) Dilution of blood serum with a 0.75% NaCl solution (instead of water.) (b) The stock solution contains NaBr 166.8 mg.% (instead of 142 mg.%) in a 0.70% NaCl solution (instead of water). (c) The working standards are prepared with a 0.70% NaCl solution (instead of water).