animal the enteric agglutinin titer dropped sharply; with complete prostration and palsy, the titer value was reduced to 1:10 values and often to zero.

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Relationship Between Chloride Content and Blood Cerebrospinal Fluid Bromide Ratio.

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In previous investigations attempts were made to determine whether there were any relationships between the amounts of various substances contained in the blood and cerebrospinal fluid and the distribution ratio in these two fluids of bromide administered and determined by the Walter method. Of these substances, the chloride salts, by virtue of the very close relation that exists between them and bromides, were the first to attract our attention in this respect. It has been shown that the blood chloride content is lower than that of the cerebrospinal fluid (the ratio being about 0.80 to 1). Furthermore, in the cases of mental disease that we have been investigating, this ratio fluctuates within narrow limits. Our first investigation, then, was to determine whether there was any direct relation between these fluctuations and that of the bromide distribution. Such a relation could not be found to exist. In a series of cases of manic depressive psychosis we found a variation of the chloride ratio between 0.79 and 0.89, but this fluctuation did not bear any direct relationship to the changes in the bromide ratio.[1]

The technique of our method of determination of the bromide ratio, however, introduced a new factor, the fact that the blood serum had to be diluted with 2 parts of water before it could be compared with the spinal fluid, since the bromide content of the blood is usually about 3 times that of the spinal fluid. In previous investigations we have used distilled water for this purpose, but this meant that the chloride content of the diluted serum was brought down to one-third of its original content. The blood chloride content is usually about 0.6%, and the question arose, whether the

[1] Rothschild, D., and Malamud, Wm., *Arch. Neurol. and Psychiat.*, 1931, **26**, 829.

reduction of this to about 0.2% did not influence the bromide ratio obtained. With this in mind we undertook a series of double determinations in 32 cases. In each of these cases we first obtained the quotient (*i. e.*, blood bromide content: cerebrospinal fluid content) by diluting the blood serum with 2 volumes of distilled water, and then using part of the same specimen, we diluted the serum with 0.65 NaCl. The results are represented in Chart 1.

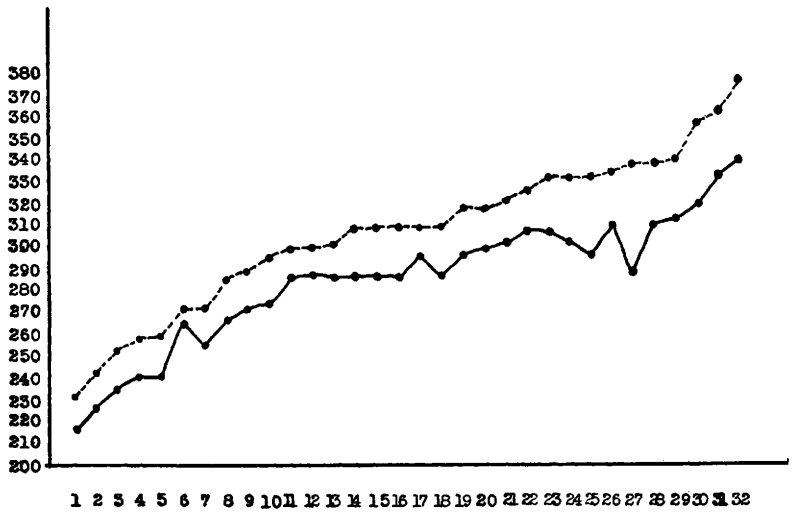

CHART 1.

The figures at the bottom represent the numbers of cases. The figures at the left hand margin are the quotients from 2.00 to 3.80. The dots connected by the continuous line represent the quotients obtained by using the 0.6% NaCl solution to dilute the serum. The dots connected by the interrupted line represent the quotients obtained in the same cases where distilled water was used for the dilution.

From this chart we see that all of the quotients determined by diluting the blood with 0.6% NaCl are lower than those determined in the original manner; *i. e.*, that in the presence of a higher chloride content less of the bromides are recovered in the blood. This meant that in a solution containing both chlorides and bromides, the former interfere with the complete recovery of the latter. To determine the extent of this influence we undertook the following experiments:

(A) In a number of specimens of blood serum we removed all the chlorides and bromides by silver nitrate and then, dissolving a known quantity of bromides in these, determined the bromide content by the Walter method, using an aqueous solution of bromides as a standard. The results were as follows:

1	Serum with 20 mg. per 100 cc.	Result 21 mg. per 100 cc.
2	24	25
3	28	27.2
4	40	41
5	48	49
6	56	58

These results show that the bromides introduced are recovered with slight variations above and below the actual amount introduced, the variations most probably depending upon the usual range of error in colorimetric determinations.

(B) Similar determinations were carried out in spinal fluid from which the chlorides and bromides were removed by silver nitrate, with the following results:

1	Spinal Fluid with 20 mg. per 100 cc.	Results: 21.5 mg. per 100 cc.
2	22	21.5
3	24	24.7
4	26	24.5
5	28	28.9
6	30	28.5
7	32	29.5
8	40	40.8
9	48	49.0
10	56	58.0

These results are similar to the ones obtained with the blood serum.

(C) Known quantities of bromides added to distilled water:

1	Water with 100 mg. per 100 cc.	Results 100 mg. per 100 cc.
2	25	25.5

The addition of NaCl to the water, however, gave different results, viz.:

1	0.2% NaCl with 100 mg. of bromide.	Results 86.5 mg. per 100 cc.
2	0.3%	78.0
3	0.6%	73.7

These results show that in chloride-free water the recovery of bromides is similar to that of chloride-free serum or spinal fluid. In the presence of chlorides, however, there is a loss of some of the bromides, the loss increasing with the increase in chloride content.

(D) A similar loss of bromides was found in experiments with known quantities of bromides dissolved in blood serum and cerebrospinal fluid from which the chlorides were not removed.

Conclusions. (1) The determination of the bromide content of a fluid containing chlorides, by the Walter method, is influenced by the amount of chlorides in that fluid. The loss of bromides is di-

rectly proportional to the amount of chlorides. Blood serum, cerebrospinal fluid, and water are, within narrow limits, similar in this respect. (2) The determination of the bromide content by the Walter method in chloride-free fluid is reliable, the margin of error being quite limited. (3) Blood and cerebrospinal fluid containing similar quantities of chlorides would be liable to the same error, and the bromide contents obtained would be reliable for purposes of comparison. (4) For absolute reliability the technique of the Walter method should be modified as follows: *a.* The blood should be diluted with a NaCl solution, the strength of which is equal to that of the blood. *b.* The chloride contents of the blood and cerebrospinal fluid should be determined, and in computing the actual amount of bromides allowances should be made for the loss due to the chlorides. The present investigation shows that the loss caused by 0.6% NaCl (which is the average NaCl concentration in blood serum) is about 27%. Further studies are being made to determine the exact losses due to NaCl concentrations ranging from 0.4% to 0.9%.

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A Modified Class Demonstration of Difference Between Ephedrine and Epinephrine Blood-Pressure Response After Cocaine.

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The demonstration of cocaine sensitization for epinephrine and desensitization for ephedrine according to Sollmann and Hanzlik[1] calls for the following sequence of administration in a doubly vagotomized dog under barbital anesthesia: Epinephrine (0.05 mg. per kg.), ephedrine (2.5 mg. per kg., both intravenously), cocaine (10 mg. per kg., hypodermically), then repetition of the epinephrine and ephedrine injections after suitable intervals of time.

The epinephrine dosage should be 10 times less[1] and even as low as 0.002 mg. is very satisfactory in atropinized dogs under amytal anesthesia.

In regard to the ephedrine desensitization by cocaine we ran 3

[1] Sollmann, T., and Hanzlik, P. J., Experimental Pharmacology, W. B. Saunders, 1928, 227, 282.