sections show a minute fragment of hypophysis, probably intermediate lobe, in the first one, not over 1/20 of the total gland. In the second one the Diencephalon has been pushed away by the spinal cord of the first animal, connecting with the Rhombencephalon of the second one. The infundibular region is covered with an extensive crust of hypophyseal lobules which, structurally, resemble rather the intermediate lobe type.

Again the color differences in these chains are lasting, even through metamorphosis. And again do we observe that the metamorphic changes of both animals run synchronously.

It appears that the zone of fusion acts like a filter, allowing the metamorphosis hormone to pass but retaining the melanophore hormone. Microscopic study shows that the circulatory systems of the 2 individuals are connected by a net of capillaries only. This seems to indicate that the melanophore hormone is quickly used up, disappearing in the capillaries.

If frogs or toads are grafted in chains the hypophysis deprived animal stays lighter for about the first 2 weeks. In chains of 3 the third animal is very light for an even longer period. As in twins, however, the second animal later turns to its normal color. Metamorphosis occurs simultaneously. When the resorption of the tail stump of the first animal begins, the second animal presently turns light again.

Frogs and newts therefore give identical results for the metamorphosis hormone and are but quantitatively different with respect to the melanophore hormone.

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The Barrier Between the Blood and Cerebrospinal Fluid; a Microchemical Modification of the Walter Method.

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In investigations of this barrier by the Walter bromide method,[1, 2, 3, 4, 5] the value of the procedure as an aid in the diagnosis and

[1] Malamud, Wm., Fuchs, D. M., and Malamud, N., *Arch. Neurol. and Psychiat.*, 1928, **20**, 780.

[2] Malamud, Wm., Wilson, R. B., *Arch. Neurol. and Psychiat.*, 1929, **22**, 1135.

[3] Malamud, Wm., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 477.

[4] Malamud, Wm., Rothschild, D., *Arch. Neurol. and Psychiat.*, 1930, **24**, 348.

[5] Malamud, Wm., Hayward, E. P., *Zeitsch. ges. Neurol. und Psychiat.*, 1930, **128**, 295.

the control of treatment of mental diseases was demonstrated. The practical application of the method, however, was seriously hampered by technical drawbacks, one being the comparatively large amount of spinal fluid (8 cc.) necessary for the performance of the test. Such quantity at one puncture is, with few exceptions, contraindicated in most cases of disease of the central nervous system. In most instances it may be followed by headache, vomiting, backache, etc. In some diseases (such as intracranial tumors) it is quite dangerous and in some cases followed by death. The removal of small quantities is practically never dangerous if carried out with a reasonable degree of care. We have therefore searched for a modification of the original method that would enable us to carry out the test with a smaller quantity of fluid.

We here describe such a modification and its application in 119 cases where both methods were used and checked against each other, and where the large quantity necessary for both determinations could be taken without any untoward sequelae.

After administration of bromides and preparation of patient,[1] 15 cc. of venous blood is taken and treated with trichloracetic acid and gold chloride.[1] The solution is then read in a colorimeter against a standard of known bromide content, and the bromide concentration in the blood computed.

Three cc. of spinal fluid is then obtained by lumbar puncture and to this 0.6 cc. of 30% trichloracetic acid is added. After allowing this to stand for 15 minutes, it is filtered and to 2 cc. of the filtrate 0.4 cc. of 0.5% gold chloride is added. The solution obtained is then read against a standard bromide solution and thus the bromide content of the spinal fluid is determined. By dividing the bromide content of the blood by that of the spinal fluid we get the *distribution ratio*. (To gain time one can read the spinal fluid directly against the blood and thus obtain the ratio.) The colorimetric determinations are made with the aid of a Duboscq microcolorimeter No. 3625 instead of the original macrocolorimeter No. 2502.

In 119 cases there was a very high degree of correlation between the readings obtained by the 2 methods. In a large number of them the readings were actually identical. In the others they varied within 0.07. Since the variation in different readings by the same method and the same person are at least at high as these, it would seem that there is practically no difference between the two.

The correlation between the 2 methods, then is $+.999 \pm .0001$.

The results obtained show that the above described modification is reliable and can be safely used instead of the original method.