THE DETERMINATION OF MAGNESIUM IN BLOOD WITH
8-HYDROXYQUINOLINE

A Note on the Paper by Greenberg and Mackey

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In the May, 1932, number of this Journal, Greenberg and Mackey1 presented a paper in which they described a method for the determination of magnesium in blood, serum, and plasma with 8-hydroxyquinoline, which depends upon the bromination of the quinoline in the magnesium-8-hydroxyquinoline precipitate. This method had already been published by me in October, 19312. In referring to my method the authors say: "When our experimental work was about completed, there appeared a paper by Bomskov, for the determination of magnesium in serum by hydroxyquinoline, which also employs the bromination reaction. In other respects, our method differs largely from and, we feel, is superior in point of simplicity to both those of Bomskov. . . ." These points of difference are (1) only one precipitation is used because of the calcium having been removed by working with oxalated blood; (2) the precipitate of magnesium hydroxyquinoline is isolated by filtration instead of centrifugation; (3) for the bromination of hydroxyquinoline a considerable excess of bromine is used.

I cannot feel that my method differs largely from that published by Greenberg and Mackey. As regards simplicity, only the first point is an improvement. However, in the clinical laboratory it is of the greatest interest to determine the calcium and the magnesium in the same blood sample. This can be done in the trichloroacetic acid filtrate which I use for the magnesium determination, but not in the oxalated blood or plasma which is used by Greenberg and Mackey.

Mackey. The second point, the isolation of the precipitate by filtration instead of centrifugation, cannot be deemed a step in the direction of simplicity. I myself think it quite simple to precipitate, to wash, to centrifuge, and to titrate in the same centrifuging tube, without filtering the precipitate. The third point is a theoretical one. In my magnesium determinations, I used an excess of bromine equal to twice the theoretical amount for the bromination of the hydroxyquinoline. I found this to be a sufficient amount to give rapid bromination. Greenberg and Mackey increase this excess of bromine considerably but I do not feel that this is a point of great importance.

In our laboratories we have determined the magnesium content of about 200 blood samples. The following is a résumé of some of our results. The magnesium content of the blood serum of six normal men, varying in age from 58 to 62 years, ranged from 1.7 to 2.6 mg. per cent; that of normal children, varying in age from 4 months to 13 years, ranged from 1.3 to 2.5 mg. per cent; that of children with florid rickets, varying in age from 1½ to 10 months, ranged from 0.8 to 1.1 mg. per cent.
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