The results are tabulated in Tables I and II. In 10 of 13 determinations, the calcium was higher in the cyst fluid than in the blood serum. In 5 of 8 determinations of phosphorus, it was higher than in the serum. In 8 of 9 determinations, the cyst fluid was more acid than the blood serum.

In 2 cases the cysts were grossly infected and here the calcium was lower than in the blood serum. In the rabbits, no bone was formed and the hydrogen ion concentration and phosphorus content of the cyst fluid did not differ markedly from similar values in the blood serum.

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Effect of Bile Salts on the Blood Calcium.*

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The relation of calcium metabolism to jaundice has long been a matter of clinical observation. Changes in the bones following both cholemia and prolonged loss of bile are a matter of common knowledge.

More recent work by Walters[1] and Heyd[2] and others has put the therapy of jaundice by the intravenous injection of calcium chloride on a very firm clinical basis so that it is used as a routine in many clinics today. While the effect aimed at has generally been the decrease in the coagulation time of the blood as a preparation for surgical therapy, the results achieved have gone further than that, and it is without a doubt true that there is also a marked temporary detoxification produced by the intravenous injection of large amounts of calcium chloride.

The studies of Still[3] have shown clearly that it is the bile salts which are the offending factor in cholemia as the other elements of the bile are nontoxic.

Buchbinder and Kern[4] have shown that in animals and man the

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1 Walters, W., *Minnesota Med.*, 1925, vi, 25.

2 Heyd, C. G., *Am. J. Obst. and Gyn.*, 1930, xix, 203.

3 Still, E. U., *Am. J. Physiol.*, 1929, lxxxvii, 728.

4 Buchbinder, W. C., and Kern, R., *Am. J. Physiol.*, 1927, lxxx, 273.

blood calcium tends to be rather low and Cantarow, Dodek and Gordon[5] have confirmed the early work showing a greater excretion of calcium in jaundice. Walters and Bowler[6] show that twice the amount of calcium salt injected intravenously may be required to raise the blood calcium to a given level in a patient with jaundice as in a normal person.

TABLE I.
Effect of Bile Salts on Blood Calcium.

	Control	1 hr.	2 hr.	4 hr.	6 hr.	8 hr.	24 hr.
1. Intraperitoneal, 4 cc. 10% sal. per K	11.2	11.4	11.6	Dead			
2. Intraperitoneal, 2.5 cc. 10% sal. per K	11.6	11.8	11.8	11.6	11.5	11.4	10.7
3. Same	11.1	11.8	11.68	11.36	11.02	10.9	10.58
4. Same	10.69	11.68	10.6	10.36	10.1	10.02	10.0
5. Intravenous (20 min.) 200 mg. per K	12.0	10.6	11.8	11.9	11.58	11.36	10.69
6. Intravenous, 300 mg. per K	11.9	11.8	11.25	11.03	11.03	10.97	10.69
7. Intravenous (20 min.) 300 mg. per K	10.4	10.13	10.13	10.1	9.7	9.6	Dead

With these points in view the following series of experiments were undertaken. A 10% solution of bile salts was injected intraperitoneally into 4 dogs; to 3 it was administered intravenously, and the blood calcium determinations were made at short intervals thereafter. It can be seen from the accompanying table and chart that in each case, exactly the same result is achieved following a short preliminary rise there is invariably a marked fall in the blood calcium. This fact is of interest in its possible relation to the mechanism of the toxemia produced by accumulation of bile salts in the blood. While no explanation of the phenomenon can be given, the obvious fact of the insolubility of the calcium compounds of bile acids suggests their precipitation. Studies of the reticulo-endothelial system are being undertaken to test this hypothesis.

[5] Cantarow, A., *et. al.*, *Arch. Int. Med.*, 1927, xl, 129.

[6] Walters, W., and Bowler, J. P., *Surg. Gyn. and Obst.*, 1924, lxix, 200.