determined that, after this procedure which causes hydrolysis, a considerable quantity of phosphorus is present in the filtrate. This amount agrees closely with that of the fraction which we have termed "non-hydrolysable phosphate."

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Further observations on the chemistry of cod liver oil.

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It has been stated previously[1] that the constituent of cod liver oil which influences the mineral metabolism, when cod liver oil is used in treating rickets, is contained in the unsaponifiable fraction of the oil. Further attempts towards isolating the active material have yielded the following results. A good yield of crude product can be obtained by directly extracting cod liver oil with 95 per cent. alcohol. This mixture of fatty acids, a small amount of oil, and other substances, is saponified with sodium hydroxide, and when the calcium soaps are precipitated from an aqueous solution, the unsaponifiable material including the active substance, is precipitated with the soap. From this calcium soap, acetone will extract the active material. In this manner we have obtained preparations of the active material which after a dilution of 1:1000, are as active as the original cod liver oil. The chemical nature of the substance has not yet been determined, but we believe that we are approaching its actual isolation.

With regard to the properties of the active material thus obtained, we can say that it is not toxic in doses of more than 50 times the curative dose. A single large dose in our experiments brought about healing at the same rate as a succession of small doses. The purified active material is entirely free from fat soluble A as shown by the fact that it will not cure xerophthalmia when a subsequent treatment with butter fat does cure the condition.

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[1] Zucker, Pappenheimer and Barnett, PROC. SOC. EXP. BIOL. AND MED., 1922, xix, 167.