

gether with the water added, the intestinal contents amounted to 280 cc. and had an acid reaction. The whole was treated with four times its volume of absolute alcohol, and left with occasional shakings for forty-eight hours. It was then filtered, and being still acid was evaporated in a large dish on the water-bath, the temperature of the fluid not going above 70° C. at any time; absolute alcohol was occasionally added to carry off the balance of water at the same low temperature. When the material had been reduced to a thin syrup it was mixed with a large quantity of powdered glass, evaporated to dryness in vacuo at 45° - 50° C., and then placed in a Soxhlet extractor and thoroughly extracted with ether. This removes all of the lecithin, cholesterin and fats, a great deal of coloring matter, extractives, etc. It is, of course, understood that the method of treatment was governed by the substance sought. If no cholin was present my question could not be answered in the affirmative; on the other hand, the varying statements in reference to the ease or difficulty with which lecithin is decomposed made it imperative that the possibility of its decomposition should be avoided. Marino Zuco is the chief authority for the statement that lecithin is easily decomposed by analytical methods, and the method devised by him includes digesting on the water-bath for twenty-four hours at 70° . It is apparent, therefore, that much less injury must result from evaporating the fluid at the same temperature in one-eighth of the time. Further, I find that drying at first and extracting with ether in Soxhlet's apparatus much facilitates succeeding operations.

Schulze and Steiger* claim that in the examinations of certain seed contents, made by previous investigators, all the lecithin was not extracted by ether, and they make these deductions from the fact that after shaking the finely ground seeds in a flask with a quantity of ether, allowing it to stand for some hours, and then repeating the process two or three times, they were still able to obtain lecithin. This, however, is quite different from thirty-six hours extraction in Soxhlet's apparatus, as in my experiment. After extracting with ether for this length of time, one may rest assured that every trace of lecithin has been removed.

After the substance had been extracted with ether, as described, it was removed, dried and extracted with absolute alcohol, acidified with hydro-chloric acid. Of the more common putrefactive bases only the chlorides of cholin and neurin are soluble in absolute alcohol, and also the chlorides of some of the amines. The alcoholic extracts were united and evaporated to a small bulk, and were then treated with an alcoholic solution of platinum chloride, the precipitate was thoroughly washed on a filter

* *Zeitschr. f. physiol. Chem.*, xiii, 365.