

under these conditions with *ether*. The result of these experiments I now present.

In all cases where the simple and rapid method of estimation above referred to can be employed I am now accustomed to use a pear shaped glass separating vessel, which may be obtained of apparatus dealers, of about four ounces capacity, the pear stalk being represented by a short tube provided with a tight-fitting stopper, while at the opposite end of the vessel, representing the top of the pear core, is another stoppered opening. Through this last opening fluids are poured into the separating vessel: by the tube they are run out of it. I will now describe distinctly my course of procedure in these experiments. Let us suppose we have a solution of sulphate of quinine, and we make two estimations of it—one by ether and one by chloroform. The tube-cock of the separating vessel being closed, a measured volume of the solution to be examined was run in; then (out of a burette) the alkali; lastly, ether or chloroform was poured in, the whole well shaken, and set aside for at least two or three hours. When ether was used the underlying watery layer was drawn off down to the stop-cock; then a little water poured into the glass vessel, the stopper, (which was of course removed while the watery layer was being drawn off) inserted; the whole well shaken and set aside for another two or three hours. The watery layer was now drawn off to the last drop down to the very bottom of the tube, and the ethereal layer run off through a small filter into a weighed dish; a little more ether was shaken up in the vessel and run into the dish in the same way: the ether in the latter evaporated, and the residue dried at about  $270^{\circ}\text{F}$ .,\* and weighed. When chloroform was used, after the underlying layer was drawn off down to the tube-cock through a small filter into the dish below more chloroform was poured into the vessel, well shaken up, and after two hours drawn off down to the last drop through the filter, and evaporated with the first layer.

When the substances, whose effect on the accuracy of the quinine-determination was to be studied were present, these were added in solution to the sulphate of quinine solution and thoroughly mixed therewith previous to the addition of the alkali.

I have entered into these details so that my method of procedure and allusions hereafter may be clearly apprehended.

I may say further that in all my experiments specially prepared and quite pure sulphate of quinine and well washed ether and chloroform were alone employed.

I find then that, working under these conditions—

\*The residue of quinine left on evaporating an ethereal or chloroformic solution of quinine on the water-bath does not contain a constant percentage of water. I cannot agree with Mr. Allen when he implies that the "ether residue" is always hydrated to the extent of 4.28 per cent. Constant results can only be obtained by weighing the residue after drying at  $260^{\circ}\text{C}$ — $270^{\circ}\text{F}$ .