

professionals, and some of these do, as we are well aware, still adhere to the old practice of reconvertng their residues themselves.

Naturally, where this is done, the tendency arises to perform the work in the simplest and easiest manner possible, and, as a matter almost of course, the task of fusing the recovered metal is avoided as far as possible by those who are but little familiar with a process that is by no means easy in the absence of the necessary appliances for the purpose. The reduction of even a small quantity of silver in "an ordinary kitchen fire" is a far easier job on paper than it will be found in practice, and, though we have in years gone by "run down" many an ounce of the precious metal with no more elaborate furnace than that mentioned, we are not at all surprised at the reluctance shown by others in following the plan.

There are, however, several alternative methods of reducing the silver by means of what is known as the wet method, in which either the solutions are made to yield up their contents in the metallic conditions in one operation, or the precipitated chloride is further heated to bring it into that condition. So far as the carrying out of either of these plans is concerned, there can scarcely be said to exist any difficulty whatever, unless it can be in the latter case some uncertainty as to when the conversion process is complete. In fact, the reactions are so apparently simple and easy that no thought is given as to the character and purity of the final result. As we are con-

stantly seeing and hearing these wet methods put forward as being so much easier and practically as perfect in result as the more troublesome crucible process, we think it well to say a few words in the direction of indicating the weak points, and of showing how it is quite possible the final products may be wholly unfitted for photographic use.

First, let us deal with the wet treatment of precipitated chloride of silver. This is usually performed by submitting the mass of moist chloride to the action of scraps of metallic zinc, iron, or copper, in the presence of dilute acid—usually sulphuric or hydrochloric. The choice of metal is quite immaterial, except in the case of copper, on the score of expense, although, perhaps, this metal, on account of its greater freedom from impurities, gives the cleanest reduction, and often less risk of the introduction of complications. In this process the reducing action is set up by the acid attacking the metal, which leads to the evolution of hydrogen gas, and this in turn attacks the chloride of silver, combining with its chlorine to form hydrochloric acid, the silver being left on the metallic slate in a black powder. The process thus becomes a continuous and, practically, automatic one, for, as one portion of acid is exhausted in attacking the zinc or other metal, a fresh portion is liberated to carry on the work; and so, if sufficient time be allowed for the completion of the process, we have at the finish a mass of reduced silver, together with the undissolved zinc, and a salt of the latter metal *plus* free acid in solution.