

Simple Tests for Common Drugs.

The increased activity of public analysts, and the, to say the least, unsatisfactory condition in which the retailer is, in respect to responsibility for the sale of defective drugs, render it imperative that he should be able to test for himself the drugs most commonly "found wanting." The majority of chemists and druggists have been content to leave the care of the purity and strength of their drugs in the hands of the wholesale houses if bought from them or, if made by themselves, have trusted to accurate manufacturers to ensure permanent stability. Both of these practices ignore the deteriorating influence of time upon the stock articles, and the consequence is that in so many cases in which chemists are prosecuted we hear the plea of "had a long time in stock." We feel sure that under these circumstances a description of simple tests, sufficiently severe to keep the drugs within safe bounds, yet devoid of too fine operations, will be welcome to the average chemist and druggist. The following is such a description, comprehensible and able to be practically made use of by even those who have never performed a chemical test in their lives. Our selection will be seen to comprise the favorite targets of the public analyst. First, however, we must describe the apparatus and reagents (test solutions) required.

There will be no difficulty in utilizing a small space in the pharmacy for these requirements. Either the chemist will use his dispensing counter when not otherwise engaged, or, if space permits, will erect a screen to protect himself from external observation, and keep a small space clear for use as his "laboratory." Three or four feet of counter, with three rows of shelves fastened to the back of the screen, similar to the ordinary dispensing shelves, with a cupboard below, will be all that is requisite in this direction. If there be a small sink fitted into the counter, he will, of course, locate his "laboratory" in close proximity to this. Having chosen a site for the work, the remaining considerations are small. A few bottles holding about a pint (stoppered), the same number of 4-ounce stoppered, and of small wide-mouthed bottles, together with a small quantity of apparatus, will be all that is necessary. The bottles will hold such reagents as the user may determine upon as being in most common use for his work. The few standard solutions he may use, prepared according to the directions of the Pharmacopœia, must be kept in the larger bottles. With regard to these, the following remarks may be made. Do not make too much of any standard solution, as in certain cases deterioration occurs with a certain amount of rapidity. This is especially the case in hyposulphite of sodium (thiosulphate), and also, to a certain extent, in other cases. Alkali solution should be kept in a corked bottle, and should be kept as nearly full as possible. If a stopper be used, this will stick in the neck and occasion much annoy-

ance. For general reagents, such as barium chloride, silver nitrate, etc., 5 or 10 per cent. solutions may be used.

The actual apparatus used will not be very expensive. It may be either purchased direct from one of the chemical apparatus makers, or part of it may be made by the ingenious pharmacist, and the glass vessels bought from the makers.

Three pieces of wooden apparatus will be necessary—a test-tube rack, a burette stand, and a filtering stand. None of these are beyond the pocket of any pharmacist or the tools of the ingenious amateur carpenter. The simplest form of test-tube rack is an oblong block of wood about 8 inches long, 3 inches high, and 3 inches broad. A double row of holes, sufficiently large to just take the tubes, are then cut in the block by a bit of the proper size, and the rack is made. A little cutch and varnish will vastly improve it. The burette and filter stand may take any form, so long as they will hold the burette and filter and allow the vessels to stand below them. The most useful filter stand consists of two blocks of wood, about 6 inches high, with a thin piece screwed on to them about 10 inches in length, in the form of a bridge. The top of the bridge, i.e., the thin piece, which should be about three inches wide, is bored with holes varying from one to two and a half inches in diameter, and thus serves as a support for funnels of various sizes, the vessels into which the liquid is to be received being easily arranged below. A good burette stand is not so easy to make, but a couple of shillings will purchase one if wished for.

Next come the water-bath and the drying oven. The water-bath is of great importance, and may be of very varied forms. A copper water-bath is rather expensive, but, of course, very useful. An easily extemporized bath is a beaker, on which rests the dish to be heated; but the most suitable of homemade baths is an ordinary iron pot. Circles of tin are cut out to cover the top of the pot, and holes of various sizes cut in these according to the size of the dishes each is intended to support. This is supported on an iron tripod stand, and a Bunsen burner completes a water-bath which will be as effectual as the most expensive copper bath.

The drying oven is even less expensive. A tin biscuit box or quinine tin is all that is needed. If the ordinary lift-off lid is exchanged for a door, which can easily be run in a pair of grooves, and the box placed on its side on the tripod, the temperature can be easily regulated by the height and distance of the flame and the distance to which the which the door is opened. A small hole may be bored in the top, in which a cork with a thermometer is inserted, and the temperature watched. So much for the metal apparatus, which can present no difficulty to the versatile pharmacist.

Glass apparatus must, of course, be bought, for but few are able to manipulate glass themselves. Of ordinary ungraduated glass and porcelain but little is ne-

cessary. A dozen test tubes, a couple of nests of beakers, a few flasks and evaporating dishes are all that are requisite. For work, where the minutest accuracy is not necessary, a very thin porcelain dish or crucible may be substituted for the more expensive platinum. If, however, the funds will allow, a platinum crucible will be found very useful. A small retort will be required—for distillation of spirits from tinctures—and also a condenser. Supports for the retort and condenser (Liebig's condenser is the best form) will be needed, and may take any form desired, or may be obtained from the maker for a very small sum. A specific gravity bottle is also absolutely necessary. This can be obtained for a very small sum, or a very thin flask with as narrow a neck as possible may be used. It should hold 1,000 grs. at least, and the point in the neck to which 1,000 grs. of water fill it at 60° F. is carefully scratched on to the glass. The number of grains which it weighs when filled with the liquid to be examined, minus the weight of the flask itself, will then be the specific gravity of the liquid (with a decimal in the proper place, of course). In the examination of ginger and mustard an exhausting apparatus is necessary. A Soxhlet tube, an apparatus which allows the percolation and recovery of the solvent to go automatically, is obtained for about half a crown, and is well worth purchasing. One or two flasks graduated to hold 1,000 grains, together with ordinary graduated glass measures, and one or two pipettes and burettes, will practically complete the whole of the apparatus required. There will, of course, be a few little things found requisite from time to time, but most of these will be, in all probability, found in the ordinary stock of the pharmacist. To go back to the reagents, the following will be found to come in useful for almost everyday use:

STANDARD SOLUTIONS.

Soda (NaOH).
Oxalic acid ($C_2H_2O_4$).
Hypsulphite of soda ($Na_2S_2O_3 \cdot 5H_2O$).
Silver nitrate ($AgNO_3$).

ORDINARY REAGENTS.

Phenolphthalein (in proof spirit).
Barium chloride (for sulphuric acid and sulphates).
Silver nitrate (for hydrochloric acid and chlorides).
Starch water (for iodine).
Sulphuretted hydrogen (for lead).
Chromate of potassium (indicator for hydrochloric acid).
Sodium phosphate (for magnesium).
Magnesium sulphate (for phosphoric acid).
Dilute ammonia.
Dilute hydrochloric acid.
Strong hydrochloric acid.
Dilute sulphuric acid.
Strong sulphuric acid.
Nitric acid.
Oxalate of ammonia (for lime).
Ferric chloride.
Ether.