ordinary conditions, rapidly putrefy. It is also a well established fact that an organic fluid once sterilized will remain unchanged if protected from the access of fresh organisms. The result of some experiments in this direction 1 now publish.

PRESERVATION OF INFUSIONS WITHOUT THE ADDITION OF ANTISEPTICS.

In November, 1892, some infusion of gentian was made. An S-ounce flask (A), containing 2 ounces distilled water, was then boiled for ten minutes, and some of the infusion strained into it after turning ont the residual water. The neck was instantly plugged with sterilized cotton wool and the flask set aside. The infusion remained good for five weeks, and then some filamentous mould appeared. Immediately this was observed the contents of the flask were raised to boiling point and the mould destroyed. The infusion has remained unchanged ever since.

Another flask (B) was filled at the same time, November, 1892. It was thoroughly washed, some fresh infusion of gentian placed in it, the neck being plagged with cotton wool. After bringing the infusion to the boiling point and continuing the ebulition for one minute, the flask was set aside, the cotton wool plug being heated in the flame till it singed slightly, in order to completely sterilize it. This infusion has remained absolutely unchanged for fifteen months, and has been examined for bacteria at intervals, with negative results.

Some infusion of ergot was made on January 29 last, the flask (C) being previously sterilized by boiling water in it immediately before pouring in the infusion. The contents are therefore seventern days old, and have shown no sign of decomposition. A further quantity of infusion of ergot was made on January 29 last, but the infusion was boiled after introduction to the flask (D). This also remains unchanged.

Other flasks (E and F) contain infusion of bucha, the manipulation being the same as for flasks C and D respectively. The results are the same also.

Infusion of calumba made twelve days agohas been sterilized by filtration through a kieselguhr block of the Berkefeld Filter Co., and received directly into a flask (G), which has been just previously sterilized by boiling distilled water in it. The filtering block and its connections were boiled in water just before tiltration, the neck of the flask being afterwards plugged with sterilized cotton wool as in the other experiments. Some infusion of calumba was filtered in the same way and at the same time as that in G, into a flask (H) cleaned in the ordinary way only, and not sterilized by boiling water. The result is entirely different. After three days a faint turbidity appeared, which has continually increased, until now the infusion is absolutely putrid. The difference between the two experiments G and H was that flask G was sterilized and H was simply cleaned under the tap.

These experiments show, I think, that the pharmacist may do a great deal to-ward the abolition of the so-called concentrated infusion. For instance, a quantity of freshly made infusion may be filled into flasks of convenient size, the flasks having been previously sterilized in the manner described and the necks immediately plugged with cotton wool recently heated to 120-150 degrees C., say, in an ordinary kitchen oven. It would probably be safer to raise the contents of the flasks to the boiling point before putting them aside, but unless they are required to be kept a long period this will be unnecessary. Any loss of aroma through the cotton wool plug may easily be prevented by placing a rubber cap such as is used for bacteriological purposes over the mouth of the flask.

The method of filtration through cotton wool gives more trouble, but it enables one to present infusion of calumba or quassia in exactly the condition required by the Pharmacopæia, the application of heat being quite unnecessary if the filtralion be properly carried out.

In place of preserving the infusion in a series of small flasks, one larger one may be employed. It has a well-fitting rubber stopper pierced with two holes, through one of which passes a thistle funnel plugged with sterilized cotton wool and terminating just inside the stopper. The end is constricted to a narrow orifice to prevent the infusion wetting the wool when the flask is turned up, or a simple valve made from rubber tubing may be attached. The other hole receives a tube bent downward and six or eight inches long, terminating likewise just inside the stopper. A few ounces of water is first placed in the flask and boiled for ten minutes. The residual water is then turned out and replaced by the fresh infusion. Whether it is necessary to raise the contents to the boiling point after introduction will depend partly on the nature of the infusion and still more on the care which has been exercised in preparing the flask and infu-When any of the infusion is requirsion. ed it is simply necessary to turn up the flask and let it run out of the bent delivery tube, air flowing into the flask to replace the liquid poured out, through the cotton-wool plug in the thistle funnel. The entrance of organisms is thus prevented. For extra safety the open end of the delivery tube when not in use may be closed with a piece of rubber tubing and a clip. I have several times filled a flask of this kind with some infusion and poured out a few ounces daily, just as if it were required for dispensing purposes. The infusion has always remained good till the end.

I have followed a similar plan in the case of infusions-say buchu-where about two gallons is required every week. A bottle provided with a tubulure at the bottom, through which passes a glass tap or tube and clip, and holding a little over two gallons, is thoroughly cleansed and then rinsed several times with freshly boiled and cooled distilled water. The infusion is placed in the bottle and its mouth is closed by a good cork, through which a thistle funnel, plugged with cotton wool passes, in order to admit air as the contents are drawn off. It is by this means easy to keep an infusion from two to four weeks which would go bad in as many days if stored without these precautions.

The conclusions to which these experiments lead are as follows :

1. An infusion prepared with boiling water is sterile when perfectly fresh, if care be taken to avoid unnecessary exposure.

2. The infusion so prepared may be kept sterile in a flask in which water has been recently boiled.

3. Raising the contents of the flask to the boiling point after plugging renderstheir preservation more certain.

4. Cold infusions may be sterilized by filtration through kieselguhr blocks.

PRESERVATION OF INFUSIONS BY THE

ADDITION OF ANTISEPTICS.

The addition of antiseptics to ordinary infusions is, of course, inadmissible, but the so-called concentrated infusions usually contain 15 or 20 per cent, of rectified spirit. The two chief objections to this addition are (1) the cost of alcohol and (2)the alteration in physical character which is produced by its addition. In several discussions on the preservation of infusions and fluid extracts, chloroform has been mentioned, but generally dismissed as altogether without the pale of discussion. This, I venture to think, is a great mistake. For instance, I produce a concentrated infusion of senega, preserved by the addition of 1 in 400 by volume of chloroform. Fluid extracts may be preserved equally well without the use of alcohol. One fluid drachm contains, therefore, one-seventh of a minim of chloroform, a quantity surely too small for any objection to be raised to its presence. If the infusion contained alcohol as a preservative the same dose would probably be equal to fifteen minims of rectified spirit. The diluted chloroformed infusion would contain 1 in 3200 of chloroform, equal to half-drachm of chloroform water in one ounce. This amount of chloroform has a very slight taste, even in plain water, and in presence of other flavors becomes practically indistinguishable. Moreover, the addition of 1 in 400 of chloroform produces no precipitate, and no change in the physical appearance of the fluid, such as follows the addition of 15 or 20 per cent. of rectified spirit. The relative cost of chloroform and rectified spirit, when used in the proportions I have mentioned, is about 1 to 80, if 20 per cent. of rectified spirit be used. In using chloroform the greatest care must be taken to prevent contamination or incipient decomposition before the addition of the preservative to the finished product. Where admissible, it is a good plan to raise the finished fluid to the boiling point in order to sterilize it, and then add the chloroformassoon as cold.

My own experience has proved that chloroform might advantageously replace alcohol as a preservative in many pharmaceutical preparations.—*Phar. Era*.