

Original Articles.

CHLORINATION OF DRINKING WATER SUPPLIES IN THE FIELD.

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THE first apparatus for the chlorination of drinking water in the field was devised by Captain Harper-Nelson, I.M.S., in January, 1915. This apparatus was originally made by Messrs. Kemp & Co., Chemists, Bombay. Every unit of the original 6th (Poona) Division was provided with a set.

The purifying effects of chlorine on waters of doubtful potability is now almost universally recognized and calls for no insistence at this late date. It is frequently found, however, that the instructions regarding the preparation of the concentrated chlorine water are not properly carried out, with the result that the reputation of the process suffers.

It may, therefore, be useful to publish these instructions with a specification of the apparatus; they are lucid and comprehensive and given almost *literatim et verbatim* in Captain Harper-Nelson's own words. The diagrams are likewise from his original sketches.

IMPROVED CHLORINE APPARATUS FOR WATER STERILIZATION.

1. Large bottle A of capacity 24 oz. (not less). Mouth should be about one inch wide. On the side a mark should be made indicating 20 ozs. when filled up to its level with water (see diagram).

2. Small bottle B of a capacity of 1 oz. Mouth should be about three-quarter of an inch in diameter. On the side a mark should be made indicating 2 drachms (see diagram).

3. Stopper for A is perforated, and two pieces of glass tubing about 0.5 c.m. let in. One piece of tubing should be sufficiently long to reach almost to the bottom of the large bottle A. The other should be short, and just pass through stopper, projecting into bottle for half an inch (see diagram). Corks are best for this purpose for an improvised outfit, but extra ones should be supplied as they deteriorate and rot by the action of chlorine. If vulcanite tubing can be obtained it should be used instead of glass.

4. Stopper of small bottle B is perforated, and one piece of glass tubing passed through to project about half an inch inside bottle. Corks are

again used, and spare ones should be supplied. Substitute vulcanite for glass if available.

5. Bottle same size as A, and with 20 ozs. mark on it, for concentrated hydrochloric acid: In the event of bottle A getting broken this bottle could then be used in its place.

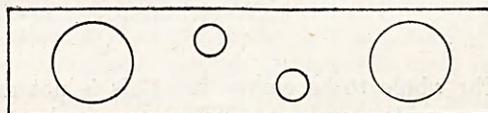
6. Small metal or vulcanite case to hold 350 five-grain potassium chlorate tabloids.

7. Small vulcanite or glass pestle and mortar to powder potassium chlorate tabloids.

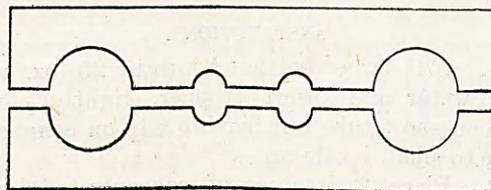
8. Half a yard of rubber tubing: Include on spare small bottle B.

This should be packed in a compact, strong, but light wooden case (see diagram). This gives a general idea of the complete outfit packed. The drawer is for spare corks, tubi g, vulcanite, pestle and mortar and potassium chlorate box.

The bottles must be firmly packed. The bottom of the box should be of double thickness, and holes cut for the bottoms to accurately fit the bottles, thus:—

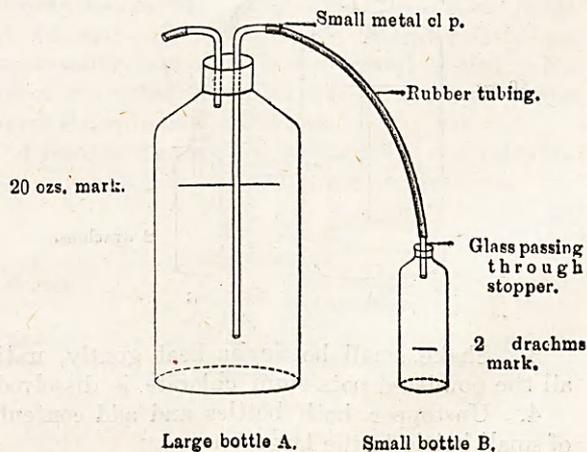


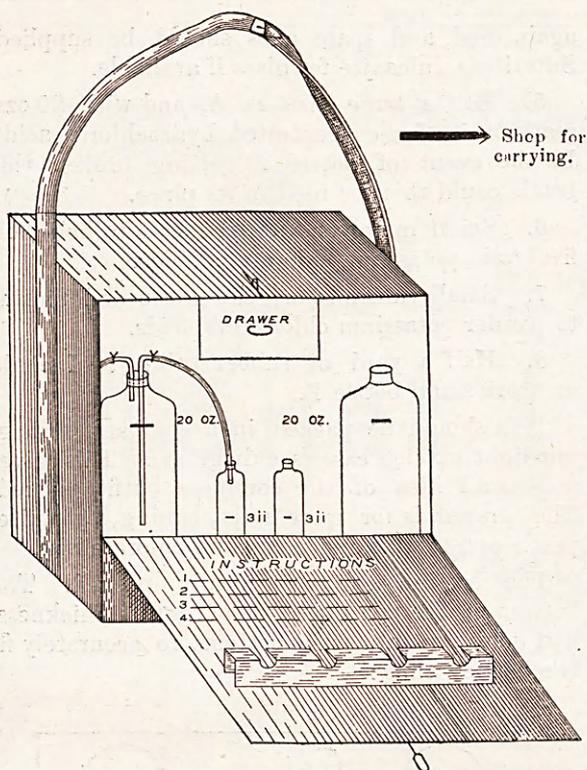
Higher up should be a rack in front and behind to grip the bottles, thus:—



(Felt lining to be put round places for bottles.)

The front rack is attached to lid, and opened with it, allowing bottles to be removed. Outfit fully loaded should not weigh more than 12 pounds.

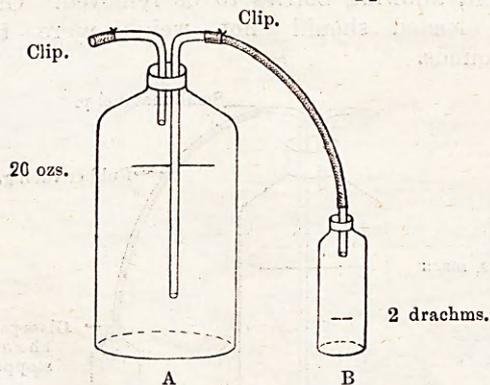




The whole to be compact. This is not drawn to any scale, and spacing between bottles is exaggerated. The two small bottles might be placed one in front of the other instead of side by side as shown.

INSTRUCTIONS.

1. Fill large bottle 'A' up to 20 oz. mark with water and insert stopper, tightly closing clip on short tube but leaving clip on connecting tube to small bottle open.
2. Place 2 drachms of concentrated hydrochloric acid in small bottle 'B.' Then take three five-grain tabloids of potassium chlorate, powder them and add powder to the acid in small bottle. At once insert stopper.



3. Shake small bottle, or heat gently, until all the powdered potassium chlorate is dissolved.
4. Unstopper both bottles and add contents of small bottle to the large one.

Chlorine water in large bottle is then ready for use.

STRENGTH.

One ounce to be added to five gallons of water and allow half an hour to elapse before drinking water treated, 2 ozs. to 10 gallons, etc.

The small bottle having a capacity of one ounce can be used as a measure.

(Note.—To be printed and affixed to lid of box.)

NOTE ON INTRAVENOUS INJECTIONS OF TARTAR EMETIC IN THE TREATMENT OF MALARIA.

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THE observations here recorded were made in the spring of 1917 at an Indian hospital in German East Africa, and were suggested by Rogers' record of three cases of subtertian and two of benign tertian malaria in which he observed the disappearance of gametes from the peripheral blood following the intravenous administration of tartar emetic. The great majority of malarial cases admitted to the hospital were of subtertian infection, and the usual type of parasite found was the ring form. In fact only one case showing crescents was available during the period of observation. German records state that about 80 per cent. of the malaria in the districts from which the cases mostly came is subtertian, the remaining 20 per cent. being benign tertian with a sprinkling of quartan.

The cases, except three, were not chosen, some being severe and some slight. The exceptions were three cases of blackwater fever, which after the blackwater had disappeared developed fever with parasites in the peripheral blood. There being some doubt as to the advisability of administering quinine except in small doses to such cases, tartar emetic intravenously was tried. One case had a relapse of blackwater after an intramuscular injection of ten grains of quinine bihydrochloride. In all thirteen cases were treated, ten of subtertian, two of benign tertian, and one of quartan. Two of the subtertian cases and the quartan case were blackwater convalescents.

The drug was injected in 2 per cent. solution in normal saline by means of a 10 cc. syringe into a vein at the bend of the elbow, the quantities administered varying from 3 to 14 cgrms., given as a rule every second or third day. At first the smaller quantities were used beginning with 3 or 4 cgrms. and working up to 8, while in later cases 10 cgrms. was given as the initial dose and increased to 14 cgrms. With the latter dosage toxic symptoms manifested themselves, coughing and vomiting being sometimes troublesome. Care had to be taken that none of the solution escaped into the tissues surrounding the vein. This happened on two