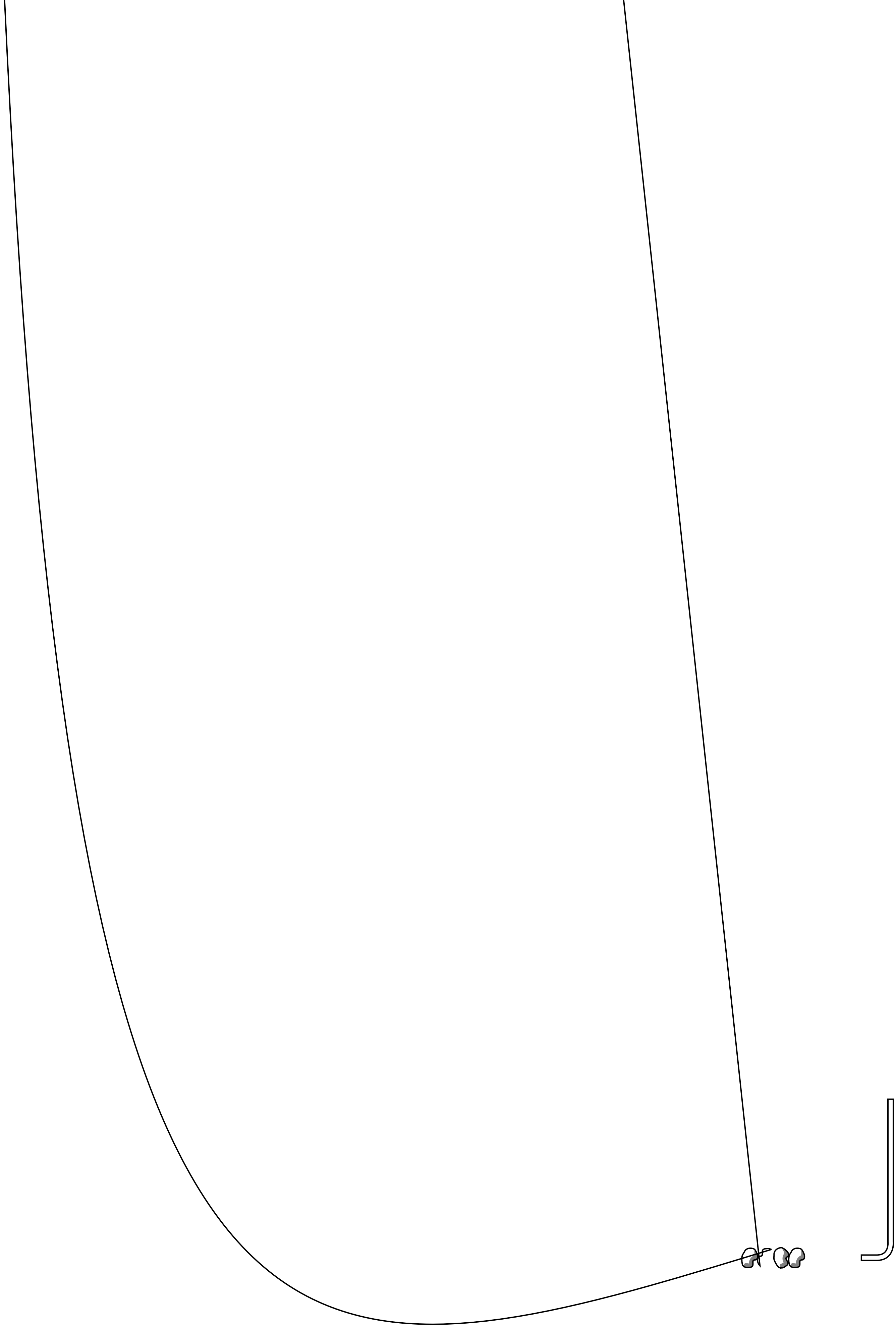
Moringa olifeira tree. The best type of coagulant and the required dose will depend on the physical properties (particularly the alkalinity/acidity) of the raw water and the amount and type of



C

The purifying element in these filters is a porous, unglazed, ceramic cylinder (often called a candle) which can be locally produced (Heber, 1985), but is usually mass-produced in factories. Manufactured filter units like that illustrated in Figure 5 (a) are available but are costly. If filter candles are available they can be fitted to earthenware pots (b); an alternative arrangement, which avoids the need for watertight connections through the jars, is to use a siphon pipe (c); open porous-clay jars (d) can also be used. Ceramic filters are appropriate only for fairly clear water because they block quickly if the water contains suspended particles. Their effectiveness depends on the size of the pores in the clay. Filters with very small pore sizes can remove all pathogens. The impurities are deposited on the surface of the candle, so need to be regularly scrubbed off to maintain a good flow rate. Boiling the filter after it has been cleaned is also recommended to kill off the pathogens trapped in the pores, but some filters are impregnated with silver to kill micro-organisms. The scrubbing wears down the ceramic material, so periodically the candle needs to be replaced before it becomes too thin to guarantee the removal of all pathogens.

R

D

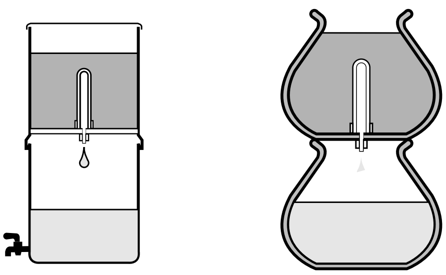
Excessive chemical salts in water make it unpalatable. Desalination by distillation (TB 40) produces water without chemical salts and various methods can be used at household level, for example to treat sea water. Desalination is also effective in removing other chemicals like fluoride, arsenic and iron. The water produced is relatively tasteless unless a little salt is added.

I

High iron content (above 0.3mg/litre), is sometimes found in groundwater collected from boreholes. It can also be a result of the corrosion of steel (e.g. pipes, borehole casings and screens) from the action of acidic groundwater. Iron precipitates cause water discoloration and can impart an unpleasant metallic taste and odour to water as well as causing the staining of food and laundry. Iron is not known to have any detrimental effects on human health, but may cause an otherwise good quality groundwater source to be rejected in favour of a bacteriologically infected surface water source. The presence of organic compounds in the water significantly increase the concentration of iron held in solution. The metabolism of some bacteria is reliant on iron and they produce a red-brown slime; decay of these bacteria also produces unpleasant odours. Treatment methods are relatively simple, being based principally on aeration followed by filtration. Many different designs of small, simple, community-level iron-removal plants have been used with handpumps, but they need commitment from someone to carry out the periodic cleaning of the stones and sand which are used for absorption and filtration. Some removal methods use biological processes (Tyrrel et al. 1988). There is little information published about household iron-removal plants. However, aeration followed by settlement, and preferably also sand filtration, is usually effective at removing excess iron.

M

Excessive manganese (above 0.1 mg/l) causes similar staining problems to excessive iron. Some forms of manganese can be removed by aeration followed by settlement or filtration.



Prepared by Brian Skinner and Rod Shaw

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