



**ROYAL PHARMACEUTICAL SOCIETY MUSEUM
66-68 East Smithfield, London E1W 1AW**

INFORMATION SHEET: 1

DRUG PREPARATION AND EXTRACTION

EXTRACTION OF THE ACTIVE INGREDIENTS OF PLANTS REQUIRES PROCESSES SUCH AS COMMINATION, INFUSION, DECOCTION, MACERATION, EXPRESSION, PERCOLATION - LARGE WORDS FOR SIMPLE PROCESSES

HISTORY

From earliest times medicines were the product of parts of plants steeped in or boiled with water. Experience showed that other liquids such as alcohol (eg. wine, brandy, etc.) and vinegar made extraction of ingredients more efficient and had a preservative action.

Prior to extraction processes using these liquids, the plants had to be prepared and made into the best possible state for ease of extraction. Plants were cut into small pieces, bruised to soften the woody parts or dried and then powdered.

The processes described in this leaflet were carried out in pharmacies. From the mid-1800s larger scale production was made possible by industrialisation.

COMMINATION

Comminution is a general term for various processes used to reduce the size of drug material.

Slicing was done with the aid of a sharp knife, shears or a root cutter. In the 19th century, machines were developed for large-scale work.

Contusion, (or bruising) is the process of reducing a drug to small particles by striking it with several blows. From ancient times this was normally carried out in a *mortar and pestle* made of stone, wood, metal or, from the late-1700s of ceramic composition. An alternative was a simple grater of the type still used in the kitchen for nutmeg or cheese.

Grinding reduced a substance to a fine powder. This was normally achieved in a mortar and pestle but using a revolving, shearing action rather than striking.

Sieving is used to ensure that drugs had been sufficiently ground to produce a suitable particle size. Any oversized particles are removed from the ground drug.

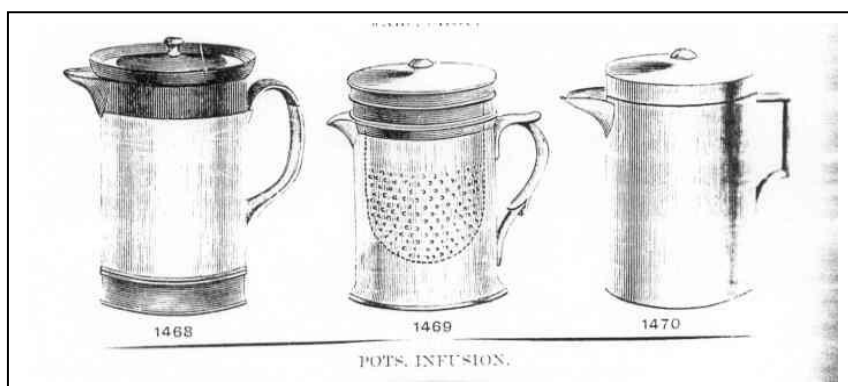


EXTRACTION

Extraction refers to processes for the isolation of the active ingredients from drug material. This may be by physical means or by dissolving in a suitable *menstruum* (liquid solvent eg. water or alcohol).

Expression is the physical act of applying pressure to squeeze out oils or juices from plants. This was normally achieved with a *tincture press*.

Infusions are prepared by simply soaking a drug in water for a specified time. This might be hot or cold, depending on whether decomposition of ingredients could occur at higher temperatures. Infusions would normally be prepared for immediate use, as there is no preservative present. In some cases concentrated infusions might be prepared by boiling to reduce the water then adding a preservative such as alcohol.



Infusion Pots from S. Maw. Son & Sons catalogue, 1903

Decoctions are prepared in a similar way to infusions but with the ingredients and water boiled for a specified period of time or until a certain volume is achieved.

Maceration differed from the above two processes in that the drug was left in contact with the *menstruum*, usually alcohol but sometimes water, for a longer period of time. The usual procedure would be to add the liquid to the drug in a closed vessel for seven days, shaking occasionally, straining, pressing the *marc* (the remaining drug/liquid mixture), mixing the two solutions and clarifying by filtering or by standing.

Percolation differs slightly from maceration. The powdered drug is dampened with the *menstruum*, left for four hours then packed into a percolator. Sufficient *menstruum* is added to cover the drug and left for twenty-four hours. The liquid is then allowed to very slowly drain from the bottom of the percolator (about twenty drops per minute). More *menstruum* is added and the process continued until the volume in the collecting flask reaches about three-quarters of the required volume. The *marc* is pressed, this liquid added to the flask, more *menstruum* added to make the specified volume then the whole liquid is clarified.

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The illustration overleaf is from a Museum postcard showing various apparatus used in the pharmacy including *Tincture Presses, Mortars and Pestles and Root Cutters*. From S Maw, Son and Thompson's 1882 wholesale catalogue.

This information sheet is also available in a large font size.
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