Section on Practical Pharmacy and Dispensing

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DROP WEIGHTS.

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It is a fact well known to physicians and pharmacists alike that the method of prescribing liquid medicines in the form of drops is not an accurate one. The only valid excuse for the use of the drop is the convenience of measuring, or better, dropping. As a unit of measure, a drop is decidedly unsatisfactory. Nevertheless we know that a large number of medicines are invariably dispensed or ordered to be taken by the drop.

The size and weight of drops varies considerably and depends upon many factors, such as the consistency of the liquid, specific gravity, cohesion, temperature, etc.

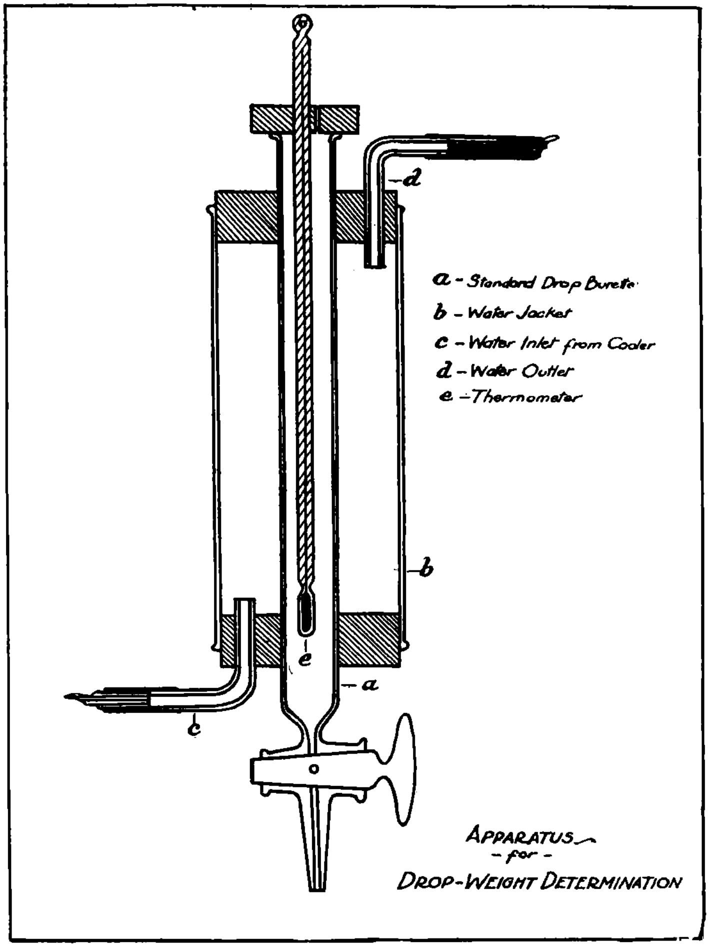
As soon as we use a certain standard drop as a primary unit and standardize all others accordingly we couple convenience with accuracy. The International Conference at Brussels in 1902 adopted a dropper which was constructed so as to deliver 20 drops of distilled water at 15° C. to weigh exactly one gram. The outer diameter of the delivery tube was to be exactly three millimeters.

A number of so-called normal droppers are on the market, for example the Eschbaum Normal Dropper, the Lamprecht Patent Dropping Flask, the Viginta Drop Glass of Steinbuch, and others. All of these are constructed to conform with the requirements of the Brussels Conference. Having occasion to determine the weight of a certain number of drops of a liquid, it occurred to the authors that a burette might readily be constructed and used to deliver the 20 drops of distilled water at 15° C. to weigh one gram. The firm of Greiner & Co. furnished a burette according to our directions—20 cc. burette accurately graduated in tenths, 3 mm. in diameter for dropping surface delivering 20 drops of water to weigh one gram at 15° C. Upon testing the burette was found to be exact provided a certain rate of dropping was maintained. The difference in weight of the drop due to a changed rate of dropping amounted to about 1 to 2 milligrams per drop.

In order to maintain the temperature during the process of dropping, the burette was jacketed and water cooled to 15° C., passed through it. A thermometer was suspended in the burette. The accompanying sketch illustrates the apparatus used.

By means of this apparatus a large number of drop weights of the more common potent medicines were determined and were found in most instances to agree closely to those determined by Dr. Frederich Eschbaum. Eschbaum was the first scientist to advance definite maxims relative to drop weights which maxims are interesting as well as important and we can only confirm the accuracy of such as we had occasion to try out. They are: First, the drop weights of solutions, even of the most concentrated ones, are practically equal to those of the solvent.

To cite an example, an aqueous 50 percent potassium iodide solution will have



APPARATUS
- for -
DROP-WEIGHT DETERMINATION

almost the same drop weight as pure water and aqueous solutions of alkaloids, sugar, salts, extracts or gums have the drop weight of water. Alcoholic tinctures have the drop weight of alcohol.

Second, different liquids have different drop weights. The authors of this paper believe that the drop weight can be used, to a certain extent at least, to help in the identification of certain pure liquids and preparations.

Third, the drop weight depends upon the size of the dropping surface. The standard for this is 3 mm.

Fourth, Eschbaum states that rate of dropping as well as temperature may be neglected for practical purposes. The authors find that it is quite necessary to preserve the temperature carefully and also to maintain a standard rate of dropping to get accurate results.

A number of drop weights of some of the more important medicines, as determined by Mr. Roon and bearing out the above statements, is appended.

Substance.	1 gm. equals at 15° c. Drops.	1 Drop weighs Grams.	1 Drop measures cc.
Acid, Hydrochloric	19.5	.051	.042
Acid, Hydrocyanic, Diluted	20.0	.050	.045
Acid, Nitric	22.9	.043	.025
Alcohol, Ethyl	65.5	.015	.020
Chloroform	58.8	.017	.010
Creosote	37.4	.027	.022
Ether	90.0	.011	.015
Fluidextract Belladonna	55.2	.018	.020
Fluidextract Ergot	52.6	.019	.020
Glycerin	23.1	.043	.030
Guaiacol	38.1	.026	.023
Oil Santal	41.5	.024	.020
Oil Wintergreen, Synthetic	40.6	.025	.020
Phenol, Liquified	35.5	.028	.025
Solution Arsenic and Mercuric Iodides	19.7	.051	.045
" Arsenous Acid	19.3	.052	.045
" Iodine, Compound	32.	.027	.025
" Potassium Arsenite	21.1	.047	.045
" Potassium Bromide, 10%	20.0	.050	.050
" Potassium Iodide, 50%	18.7	.053	.035
" Strychnine Sulphate (f℥i=1 gr.)	20.0	.050	.045
Spirit Ammonia Aromatic	57.3	.017	.020
Spirit Nitrous Ether	65.5	.015	.017
Syrup Ferrous Iodide	18.9	.053	.040
Tincture Aconite	56.3	.017	.020
" Digitalis	48.1	.021	.020
" Ferric Chloride	53.3	.019	.018
" Hyoscyamus	50.8	.020	.020
" Iodine	63.3	.016	.015
" Nux Vomica	57.3	.018	.020
" Opium	50.9	.019	.020
" Opium Camphorated	50.9	.019	.020
" Strophanthus	57.2	.017	.020
Water, Bitter Almond	29.3	.034	.037
Water, Distilled	20.0	.050	.045

LIQUID SHAMPOO OR TOILET SOAP.

ERNEST R. JONES, PH. C.

Many inquiries have appeared in the current issues of the various drug journals for a liquid soap that a pharmacist could prepare and dispense under his own label. It is my purpose to discuss such a preparation and give working formulas for the same.

Selection of Fat.—Practically all of the oils or fats are adaptable to making liquid soaps excepting perhaps castor oil, my experience with this oil showing it to produce a soap having very poor lathering qualities.

Corn oil makes a good soap; saponifies easily and the soap is free from objectionable odor. It lathers quickly but the lather is too light. Sweet almond