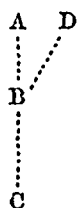


Bunsen proved that the rapidity of filtration is very nearly proportional to the pressure under which it is effected. In the old way, when filtration is performed in the atmosphere, the pressure is but very small. The new method consists in receiving the filtrate in a partial vacuum, so that filtration takes place under a pressure more or less nearly equal to that of the atmosphere—30 to 34 feet, instead of a few inches of water.

For this purpose two things are necessary, a strengthening of the filter and the production of a vacuum.

For the latter purpose air pumps are applicable; the vapor of water, and especially the corrosive vapors of acid, would soon deteriorate the machine. The vacuum is easiest produced by means of a stream of water flowing down a vertical tube ABC, which latter is



connected with the receiver by a tube BD, which at an acute angle, enters the main tube ABC. If the tube BC be passed through one or two stoppers, and connected below with a drain, a very effective filtration under pressure will be possible. Even a fall of 8 feet is quite effective.

The receiver D consists of a strong glass vessel to receive the filtrate, closed air tight by means of a good stopper (best of rubber) through which the funnel and a glass tube pass, likewise air tight. The glass tube is connected with the tube DB by means of a stout rubber tube. In the very accurate funnel is a circular and very thin piece of platinum foil, slit up along one of its radii, and folded exactly like a smooth filter; this platinum-foil filter serves to enable the paper filter to sustain the pressure, but does not hinder the filtration. The circular plate of platinum is from 1 to 1½ inches in diameter.

The operation of this apparatus will now readily be understood. As soon as the water falls down the tube ABC, air is borne along between the drops (as in the old Catalonian bellows.) If the apparatus is tight, the air can only come from the receiver, which therefore rapidly will be evacuated, so that the pressure of the atmosphere being no longer balanced from inside of the receiver, will force the liquid rapidly through the filter.—GUSTAVUS HINRICKS, in the *Pharmacist*.

Sympathetic Inks.

Various chemical substances are used as sympathetic inks—a moderately dilute solution of chloride of cobalt is perhaps the most popular. Letters written with it are first scarcely perceptible, but when gently warmed they become quite visible, being at first of a rich red color, which rapidly changes to green. Advantage has been taken of this fact to produce drawings, in which the houses, branches of trees, etc., are drawn with ordinary India ink, while, for the foliage, the cobalt ink is used. So long as the pictures remain cold, they represent a cheerless winter scene; but when brought near the fire, they rapidly assume the brilliant and beautiful foliage of spring or summer. This phenomenon is mentioned in a book on alchemy, printed in the year 1705, and bearing a title which we translate, *Clue to the Cabinet of the Secret Treasures of Nature*. In 1736, a vagrant alchemist performed the trick in Paris for money; but it has now ceased to be a wonder, and is considered only as one of the many amusing plays of chemistry.

French and English Weights and Measures.

	Grains.	Av. oz. B.P.	Troy oz. P.L.
1 Centigramme =	0.154		
1 Decigramme =	1.543		
1 Gramme =	15.432		
1 Kilogramme =	15432.349	35.274	32.151
	Fl. drachm.	Fl. oz.	Pint.
1 Litre =	281.720	35.216	1.761
	Grammes.		Litres.
1 grain =	0.0605	1 Fluid dr.	0.0035
1 Av. oz. =	28.349	1 Fluid oz.	0.0284
1 Av. lb. =	453.593	1 Pint	0.5679
1 Troy dr. P.L. =	3.888	1 Gallon	4.5434
1 Troy oz. P.L. =	31.103		
1 Troy lb. P.L. =	373.242		

NOTE.—For all practical purposes we may regard—

The centigramme to equal	1-7th of a grain;
" decigramme "	1½ grain;
" gramme "	15½ grains;
" kilogramme "	{ 35 oz. Av., B.P. or
	{ 32 oz. Troy, P.L.
" litre "	{ 35 fluid ounces;
" oz. Av., B.P. "	28 grammes;
" oz. Troy, P.L. "	31 grammes.

The Tables printed in the British Pharmacopœia furnish exact data for all calculations connected with Pharmaceutical weights and measures, including those involved in the intermutation of the British and French systems. But calculations made with such unwieldy numbers as 15432.348, 15.432, 3.549, and 437.5 are necessarily very troublesome, and the results obtained may easily be misinterpreted by those who have had little practice in operating with decimal fractions. To avoid the trouble of multiplying and dividing by such numbers, the following simple rules may be adopted, when absolute accuracy is not required—

TO REDUCE AVOIRDUPOIS OUNCES TO GRAINS.

Multiply by 44, and add a cipher to the product.

Examples.—	1×44 = 44 or 440 grains.
	4×44 = 176 " 1760 "
	8×44 = 352 " 3520 "
	16×44 = 704 " 7040 "

[The results thus obtained exceed the true equivalents by 2½ grains per ounce, and may be readily corrected when necessary by subtraction. For example, 1760 less four times 2½, or 10, equals 1750, the exact number of grains in 4 oz.]

TO CONVERT GRAINS INTO AVOIRDUPOIS OUNCES.

Multiply by 23 and cancel four figures on the right of the product.

Examples.—	875×23 = 2,0125 or 2 oz.
	4375×23 = 10,0625 " 10 "
	7000×23 = 16,1000 " 16 "

[The fractional values of one-quarter, one-half, and three-quarters of an ounce, are respectively indicated by numbers approximating to 2500, 5000, and 7500 in the cancelled portion of the product. Thus 766×23 = 1,7618 or 1½ oz.]

TO CONVERT FRENCH GRAMMES INTO ENGLISH GRAINS.

Multiply by 154 and cancel the last figure of the product.

Examples.—	4×154 = 61,6 or 61 grs.
	10×154 = 154,0 " 154 "
	25×154 = 385,0 " 385 "
	1000×154 = 15400,0 " 15400 "

[The results thus obtained come very near to the true equivalents. With 1000 grammes or 1 kilogramme, the difference does not amount to 33 grains.]

TO CONVERT ENGLISH GRAINS INTO FRENCH GRAMMES.

Multiply by 65 and cancel three figures on the right of the product.

Examples.—	437×65 = 28,405 or 28 grammes.
	2625×65 = 170,625 " 170 "
	7000×65 = 455,000 " 455 "

[The results thus obtained are sufficiently accurate for all practical purposes. The error with 7000 grains, or 1 lb. does not amount to 1½ grammes.]

TO CONVERT FRENCH CUBIC CENTIMETRES INTO FLUID DRACHMS.

Multiply by 28 and cancel two figures on the right of the product.

Examples.—	11×28 = 3,08 or 3 fl drs.
	29×28 = 8,12 " 8 "
	1000×28 = 280,00 " 280 "

[The results obtained by this rule are pretty accurate. The error with 1000 cubic centimetres, or 1 litre, corresponds to about 2 drachms.]

TO CONVERT FLUID DRACHMS INTO FRENCH CUBIC CENTIMETRES.

Multiply by 35 and cancel the last figure of the product.

Examples.—	8×35 = 28,0 or 28 cub. cent.
	160×35 = 560,0 " 560 "

[The results are a little too low; however, the error with 160 fl drachms or 1 pint, does not amount to 8 cubic centimetres.]

J. C. B.

—From *Chemists' and Druggists' Almanac*, 1868.

A New Hypnotic.

Chloral, and Trichloroacetic acid, will, under certain conditions, in alkaline solutions, generate chloroform. This fact has been turned to profit by Dr. Oscar Liebreich, of Berlin. He has administered an aqueous solution of chloral, hypodermically, first to rabbits, and then to a patient. 0.1 gramme, thus administered to a young rabbit, produced an effect within ten minutes. The animal fell into a deep sleep, during which he could be moved in any way without awaking; the respiration and pulse were somewhat retarded, regularly and reflex excitability remained. An adult rabbit received 0.3 gram., and went through the same series of phenomena; finally losing reflex excitability, he lay for some hours breathing quietly, then awoke suddenly, and seemed quite well. Subsequent experiments upon a patient in the Charité Hospital seem to show that chloral, administered by the stomach or by subcutaneous injection, is a sure hypnotic, free from danger and followed by no ill results. It acted well even when large doses of opium or morphine failed. It is not yet an article of commerce, but, it is hoped, will soon be manufactured upon a large scale. [*Virchow's Arch.*, 47 B. 1 H.]—*In Boston Med. and Surg. Journal*.

Mercurial Ointment.

M. Van der Anwermaulen suggests the addition of water to mercurial ointment, to facilitate the subdivision of the mercury. He takes, to 100 parts of mercury, 100 of lard and 5 of water, and claims to use but a few minutes for the thorough incorporation of the substances, while the ointment, after four months, yet retained its color and freshness.—*Pharmacist*.