

Original and Selected Papers.

ON A COMMON SOURCE OF ERROR IN CONVERTING IMPERIAL INTO WINE MEASURE.

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In making any of the official preparations, of which liquids form a part, it either becomes necessary to use Imperial measures, or else to reduce the quantities to the wine or apothecaries standard. The latter expedient is, generally, adopted, inasmuch as wine measures are, in this country, best suited to the purposes of trade, and are possessed by all; while measures of the Imperial gallon, and its divisions, are but seldom seen. This observation holds true particularly in regard to the larger tin measures, which are indispensable in large operations; but even when referring to graduated glass measures of one or two pints capacity, we find the apothecaries system prevailing. Many druggists are in the habit of using these smaller measures without regard to the standard which they represent, considering that an ounce is an ounce, by either system; others recognize a difference, but think it of too trifling a nature to be of practical importance. As far as an ounce, or a few ounces, are concerned, this may be perfectly true, and, perhaps, allowable, but should the quantity reach a pint, or even less, the difference is quite appreciable.

The supposition that the Imperial and wine ounces are alike, or nearly so, has led to the establishment of a rule, which is not only largely used in practice, but may also be found laid down by several authorities. "To change Imperial gallons, quarts, or pints into wine measure, deduct one fifth; for the reverse operation add one fourth." The extreme simplicity of this rule, and the ease with which it can be carried into effect, have secured its almost universal acceptance; but even for the ordinary operations of buying and selling, it is far from being sufficiently exact, and for the compounding of medicines, it is altogether inadmissible, and unworthy of the employment of any claiming the name of pharmacist. There are many in the habit of using this rule, in compounding their medicines, who would, doubtless, resent the assertion that their liquid preparations—their tinctures—were altogether unreliable, and were lacking over 3½ per cent. in strength. Such would be, nevertheless, the fact. This is rendered evident by the following considerations:—

If an imperial minim be weighed, at a temperature of 60° F., and a barometrical pressure of 30 inches, it will be found to represent 0.114 of a grain; the minim, wine, under like conditions, weighs 0.9493;

the difference between the two minims, is, therefore, about the 379-1000th of a grain. By the time the ounce is reached, this is augmented to a little over 18 grains; the ounce being equal to 455.69 grains, and the ounce, Imp. to 437.5; (the Imperial ounce, and the avoirdupois ounce are of the same value). The most important measure to the pharmacist is the Imperial pint; this is equal to 8750 grains, while a wine pint weighs 7291.1 grains. The difference between 16 oz. wine, and 16 oz. Imp., is about 291 grains or over ¼ of an ounce. This is not only an appreciable, but a serious difference; and it is plain that if a measure, graduated according to the wine standard, be used instead of an Imperial one, in making any of the stronger

preparations, as *liq. strychnice*, or *liq. morphice acetatis*, that these preparations will be proportionately weaker; in the above instances the deficiency would amount to about two and a half grains in the pint.

If, in making large quantities of tinctures, or other preparations, the rule of deducting one-fifth be employed, the difference, in some cases, amounts to over a pound, in the quantity of even a few gallons. Some years ago, the writer constructed tables for converting the amount of solid ingredients prescribed to certain definite Imperial measures, into the corresponding quantities of wine measure; one of these tables is now submitted, showing the amounts required for one pint, Imp., in measures up to ten gallons, wine:—

TABLE FOR CONVERTING THE QUANTITIES ORDERED TO ONE PINT IMPERIAL MEASURE, INTO THOSE REQUIRED FOR VARIOUS MEASURES OF THE WINE OR APOTHECARIES' STANDARD.

| Quantity of substance to ONE PINT, Imperial Measure. | | Corresponding quantity to ONE PINT, Wine Measure. | | Quantity to ONE GALLON, Wine Measure. | | | Quantity to FIVE GALLONS, Wine Measure. | | | Quantity to TEN GALLONS, Wine Measure. | | | | | |
|--|---------|---|---------|---------------------------------------|-------|---------|---|-------|---------|--|-------|---------|-------|-------|-------|
| oz. | grains. | oz. | grains. | lbs. | oz. | grains. | lbs. | oz. | grains. | lbs. | oz. | grains. | | | |
| ..... | 1 | ..... | 833 | ..... | ..... | 6.6 | ..... | ..... | 33.3 | ..... | ..... | 66.6 | | | |
| ..... | 10 | ..... | 8.332 | ..... | ..... | 66.6 | ..... | ..... | 333.2 | ..... | 1 | 229.0 | | | |
| ..... | 30 | ..... | 24.996 | ..... | ..... | 199.9 | ..... | 2 | 124.8 | ..... | 4 | 249.6 | | | |
| ..... | 40 | ..... | 33.328 | ..... | ..... | 266.6 | ..... | 3 | 20.6 | ..... | 6 | 41.2 | | | |
| ..... | 60 | ..... | 49.992 | ..... | ..... | 399.9 | ..... | 4 | 249.6 | ..... | 9 | 61.8 | | | |
| ..... | 75 | ..... | 62.490 | ..... | 1 | 62.4 | ..... | 5 | 312.1 | ..... | 11 | 186.7 | | | |
| ..... | 100 | ..... | 83.320 | ..... | 1 | 229.0 | ..... | 7 | 270.3 | ..... | 15 | 103.1 | | | |
| | 150 | | 124.980 | | 2 | 124.8 | | 11 | 186.7 | | 1 | 6 | 373.4 | | |
| | 180 | | 151.976 | | 2 | 324.8 | | 13 | 311.5 | | 1 | 11 | 185.5 | | |
| | ¼ | | 91.137 | | 1 | 291.5 | | 8 | 145.5 | | 1 | 0 | 291.0 | | |
| | ½ | | 182.275 | | 3 | 145.7 | | 1 | 0 | 291.0 | 2 | 1 | 144.5 | | |
| | ¾ | | 273.412 | | 4 | 437.3 | | 1 | 8 | 436.4 | 3 | 1 | 435.4 | | |
| | 1 | | 364.550 | | 6 | 291.4 | | 2 | 1 | 144.5 | 4 | 2 | 289.0 | | |
| | 1½ | | 1 | 109.325 | | 9 | 437.1 | | 3 | 1 | 435.4 | 6 | 3 | 433.4 | |
| | 2 | | 1 | 291.600 | | 13 | 145.3 | | 4 | 2 | 289.0 | 8 | 5 | 140.5 | |
| | 2½ | | 2 | 36.375 | | 1 | 0 | 291.0 | | 5 | 3 | 142.6 | 10 | 6 | 285.0 |
| | 3 | | 2 | 218.650 | | 1 | 3 | 436.7 | | 6 | 3 | 433.5 | 12 | 7 | 399.5 |
| | 4 | | 3 | 145.700 | | 1 | 10 | 290.6 | | 8 | 5 | 140.5 | 16 | 10 | 281.0 |
| | 5 | | 4 | 72.750 | | 2 | 1 | 144.5 | | 10 | 6 | 285.0 | 20 | 13 | 132.5 |
| | 8 | | 6 | 291.400 | | 3 | 5 | 143.7 | | 16 | 10 | 281.0 | 33 | 5 | 124.0 |
| | 16 | | 13 | 145.300 | | 6 | 10 | 287.4 | | 33 | 5 | 124.5 | 66 | 10 | 249.0 |