

standard gallon—8 gallons constituting 1 bushel. A bushel, therefore, is the space occupied by $10 \text{ lb.} \times 8 = 80 \text{ lb.}$ of distilled water, and has a cubic measurement of $277.274 \text{ cub. in.} \times 8 = 2,218.192 \text{ cub. in.} = 1.28 \text{ cub. ft.}$ This is called the "imperial bushel," and applies in the British Empire. In the United States at present, however, the term "bushel" is recognized as the space occupied by only 77.63 lb. of distilled water, the measurement of which is 2,150.42 cub. in. This is known as the "Winchester bushel," and was in early times the recognized bushel of England, being later abandoned. In various places throughout the world a bushel is actually a certain weight of a certain commodity. That weight may be a standard weight understood or enforced by law for each commodity within a certain district, country, or kingdom. Such standards, however, vary considerably in different localities. The bushel may also be a weight assigned to each line of certain commodities according to the actual weight of a bushel of capacity.

Summary.

The points of most practical value in the foregoing remarks may be briefly summarized as follows:—

1. The variable measures of weight and of volume arrange themselves round and depend very largely upon the ancient and constant British pound avoirdupois. Thus the ton, hundredweight, quarter, and bushel are in many of their meanings merely multiples of the pound avoirdupois.

2. One of the most useful equivalents in seed-analysis, and one that links up the British avoirdupois with the widely accepted metric system of weights, is the formula—1 lb. avoirdupois equals 453.59 grammes, or, roughly, 454 grammes.

3. Another most important equivalent linking the British avoirdupois with the British standard measure of capacity is that 10 lb. of distilled water equals 1 gallon. The formulas 1,000 c.c. equals 1 litre and 1 litre equals 1.76 pints are equivalents in constant use and connect the metric with the British imperial systems.

4. Great discretion must be exercised in commerce in the use of the terms "ton," "hundredweight," "quarter," and "bushel."

5. It is most important to remember that 1 c.c. of distilled water weighs 1 gramme—this not only because it connects up the capacity and weight measures under the metric system, but also because this fact underlies the standard by means of which the specific gravities of liquids and solids are compared and expressed. Specific-gravity estimations enter largely into scientific agricultural laboratory work. This cubic centimetre equivalent, together with "10 lb. water = 1 gallon," is used considerably in agricultural chemistry, notably in the preparation of solutions of a definite strength per cent. Thus 100 c.c. of water plus 1 gramme of a soluble solid is a 1-per-cent. solution of that solid, but 99 c.c. of water plus 1 c.c. of another liquid is a 1-per-cent. solution of that liquid.

LOCAL USAGE OF WEIGHTS AND MEASURES.

The more local usages of weights and measures introduce a still further set of meanings for certain of the terms just reviewed—meanings which are a very fruitful source of misunderstanding and even of extensive deception in transactions between buyers and sellers.