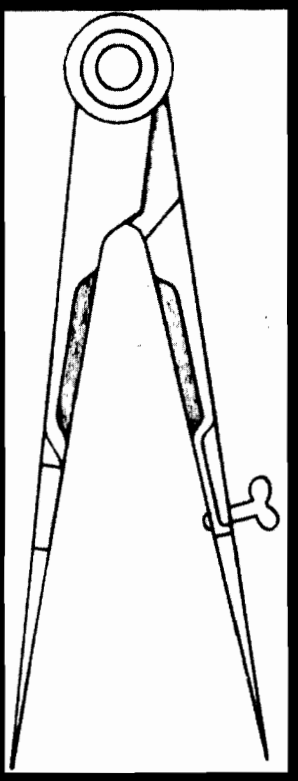

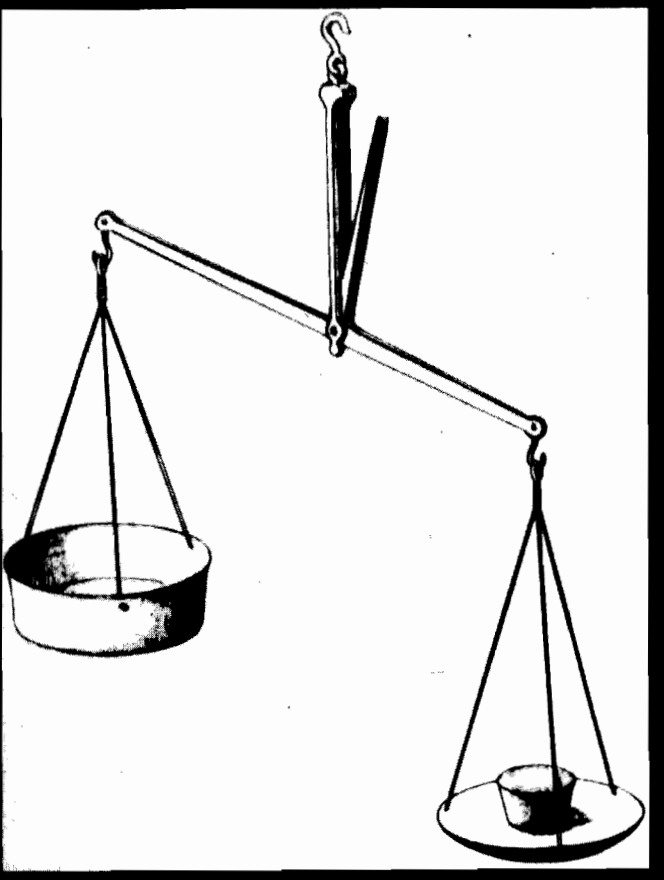

History and Archaeology
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ARCHAEOLOGICAL METROLOGY: ENGLISH, FRENCH, AMERICAN AND CANADIAN SYSTEMS OF WEIGHTS AND MEASURES FOR NORTH AMERICAN HISTORICAL ARCHAEOLOGY

Lester A. Ross

National Historic Parks and Sites Branch
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ABSTRACT

To facilitate recognition of cultural units of measure associated with Euroamerican archaeological remains in North America, knowledge of historic measurement systems commonly used by Euroamericans is essential. For Canadian research, specific systems used in England, France, America and Canada during the 15th - 19th centuries provide a comprehensive view of the plethora of measurement units in common use. Measurement units constituting these systems are systematically organized by country, type of measurement system and period of usage.

To facilitate commercial research of archaeological remains in Canada, a compilation of the major legislative statutes governing the use of weights and measures provides a glimpse of measurement customs and regulations which governed commerce during the 17th - 19th centuries.

To facilitate future research within archaeological metrology, six inferences of metrological systems, units and archaeological remains are inferred from observations of historic measurement systems, suggesting a few of the more relevant correspondences among systems, units and surviving remains.

Submitted for publication 1980, by Lester A. Ross, Parks Canada, Ottawa.

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INTRODUCTION

Jack and *Jill* went up the hill
To fetch a *pail* of water.
Jack fell down and broke his crown,
And *Jill* came tumbling after.
(Klein 1974:39)

The Greeks had a word for it - *metrologia* - denoting the theory of ratios. In our present age, metrology denotes the study of systems of weights and measures. For many non-literate societies, weights and measures appear to be idiosyncratic or communal, while among commercially oriented and literate societies, weights and measures tend to be societal, regional and national. Literate societies also attempt to standardize and codify metrological systems for the explicit goal of regulating trade. For such societies, research on past systems tends to be historical, but as one well-known classical archaeologist came to recognize, many historical metrological systems were either never historically recorded or their records of existence have subsequently been lost.

At the 9 April 1878 meeting of the Anthropological Institute of Great Britain, William Flinders-Petrie read a paper on inductive metrology in which he defined his subject as the deduction of ancient units of measure from measurements of existing archaeological remains of both historic and prehistoric architectural features (Nature 1878). One year earlier, Flinders-Petrie (1877) published his initial work on inductive metrology and through his lifelong work on pharaonic Egyptian archaeology he consistently demonstrated the value of historical and archaeological metrology for the description and interpretation of architectural and commercial remains (e.g. Flinders-Petrie 1926, 1931). Flinders-Petrie noted that cultural units of measure were easily discernible from surviving architectural remains, and argued that such units should be explicitly sought with the goal of defining ancient systems of linear measure.

Extending Flinders-Petrie's primary goal, archaeologists should seek to define culturally significant metrological units and systems for all categories of material culture, not just architectural structures. Within the anthropological and archaeological disciplines, one commonly held belief is that mankind produces material culture according to preconceived mental templates. As such, items are manufactured to meet pre-existing material, functional, stylistic and metrological requirements. Thus, the manufacture of a lithic projectile point by a pre-literate knapper may be subjected only to material, functional and stylistic requirements, while the manufacture of a firearm cartridge must also meet rigorous requirements of size and mass.

Archaeological research of material culture generally requires size determination, occasionally for interpretive purposes, but more often only for descriptive purposes. Archaeologists have a penchant for discovering statistically meaningful sizes, but rarely are such research

sizes related to cultural units and systems. In measuring artifacts, archaeologists attempt to discover valid sizes which have some significance for interpretive conclusions. Complete measurements are taken in order to define absolute size variability and relative size comparisons which may be useful for research purposes (Figure 1). Once an absolute size, with its variability, has been defined, partial artifact measurements can also serve to help identify research sizes. Normally, researchers generate size information for the purpose of demonstrating stylistic variability within an artifact class. Occasionally, however, sizes are compared to cultural measurement units in an attempt to document an historical interpretation; but rarely are attempts made to document or reconstruct cultural measurement systems.

Cultural measurement systems consist of two basic classes of systems - relative and metrological (or absolute) systems (e.g. Figure 2). Relative systems attempt to size material according to a hierarchy of relative units which are vaguely defined in relation to one another. For example, British clothing merchants used the unit *vest button* to signify the size of a button larger than a *shirt button* but smaller than a *brace button* (Figure 2). The actual metric size of a *vest button* probably had a wide range of variability, and may have overlapped in size with both *shirt* and *brace buttons*. Metrological systems, however, attempt to size material according to a mathematical scale of multiple units which are more or less precisely defined according to a standard unit of measure and which generally share one or more common ratios of relationship to one another. For example, American clothing merchants used the metrological unit of a *line* (0.635 mm) to measure button sizes, with sizes ranging between 8-50 *lines*. In this instance of a metrological system, only one metrological unit was required, and sizes were designated by a mathematical ratio of even-numbered *lines*.

For these two basic classes of cultural measurement systems there are seven types of systems classified within three groups defined by the standards used to define each system (Table 1).

Table 1. Types of cultural measurement systems classified according to standards used to define each system.

System Standards	Types of Measurement Systems
Mass Standards	Dry Weight Systems Liquid Weight Systems
Capacity Standards	Dry Capacity Systems Liquid Capacity Systems
Linear Standards	Linear Systems Superficial Systems Volumetric Systems

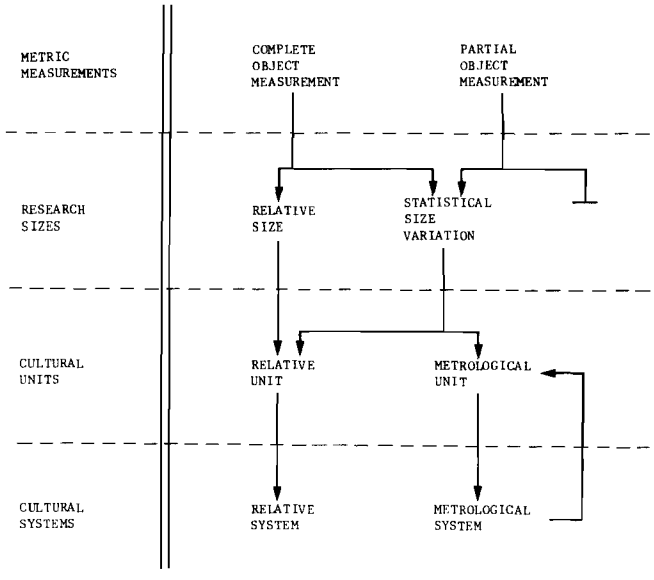

Figure 1. Relationships among material culture measurements, postulated sizes, cultural units and systems of weights and measures for archaeological research.

a) British Clothing Button Sizes

Shirt
Vest
Brace
Jacket
Coat
Overcoat

b) American Clothing Button Sizes (8-50 *lines*)

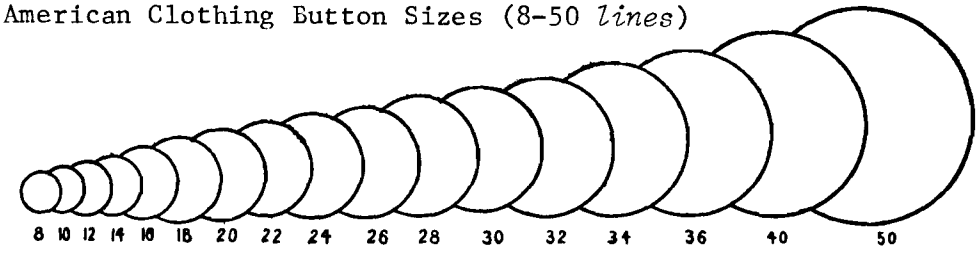

Figure 2. Examples of relative vs. metrological cultural systems for sizing 19th-century clothing buttons: a) relative cultural system used by British merchants (Ross 1976: 1380) and b) metrological cultural system, based upon a culturally unidentified line measuring 0.57 mm, used by American merchants (Montgomery Ward & Co. 1895: 85).

Standards applied to systems within a single group represent primary standards while standards associated with systems from one group and applied to systems within another group represent secondary standards. Thus, a capacity standard used to define dry or liquid capacity systems is a primary standard, but when used to define a dry weight system it becomes a secondary standard. For example, the *bushel* used to define wheat capacity in England during the 15th century would be regarded as a primary standard for the Henry VII Winchester Corn Capacity System, but when it was used to define wheat weight as in the Henry VII Winchester Corn Weight System it functioned as a secondary standard. According to the definition of wheat weight used by Henry VII, a *bushel* of wheat weighed 66 2/3 *Troy pounds*. For the dry weight system, the *Troy pound* was the primary standard, while the weight of a *bushel* of wheat from the dry capacity system was the secondary standard.

Reliance upon mass, capacity and linear standards for various types of measurement systems is paramount and must be both explicitly understood and well defined in order to reconstruct historic cultural systems from existing artifact measurements. When research measurements are taken according to a linear standard, they must be converted to a capacity standard in order to reconstruct a capacity system. Likewise, standards used to measure artifacts must be well known and convenient to work with so that discrete cultural units and ratios of such units can be easily recognized by the researcher. To facilitate the collection, manipulation and interpretation of metrological data the basic standards to be employed in research are metric weight, capacity and linear units. Converting from these units to other cultural units has become recognized as the accepted method for all metrological research, and the tables forming the body of the following report have been established to facilitate such conversions.

Prior to initiating the reconstruction of historical units and systems of measurement, it is desirable to have access to all available historic systems pertaining to the culture in question. For North American historical archaeologists working with European material culture, it would be desirable to have access to a resource document listing all European and North American measurement systems used during the 15th through 20th centuries. Such a document is non-existent, but in an attempt to partially remedy this problem, information has been compiled for many of the more common English, French, American and Canadian systems in use during the 15th through 19th centuries. These systems have been identified from various published sources, and have been arranged by country, type of measurement system and period of use. This collection of systems is far from complete, but it should serve as a basic guide to the major systems represented in North America. Through subsequent research it is hoped that specific systems used for various classes of material culture may be explicitly identified, such as the button systems mentioned previously, and such as the systems used for glass beads, nails, ceramics and glass vessels, etc. Through such research, the goal is to demonstrate the significance of metric data for deriving cultural and temporal ascriptions, and for identifying and describing unrecognized historic systems of measurement. Perhaps with the publication of the following collected work of known historical

systems of measurement, other researchers will be encouraged to analyze their metric data with similar goals in mind - such at least is the hope.

ENGLISH SYSTEMS OF WEIGHTS AND MEASURES

Unlike the French systems of weights and measures, English systems were primarily based upon national systems enacted in law by the Crown. There were also city and county systems, but their usage was officially discouraged by the use of regional inspectors who possessed "exact" copies of royal metrological standards. Through use, these comparative standards often became inaccurrate copies of original standards which only approximated the true metrological units of their systems. However, the use of these regional inspectors and gaugers did help alleviate regional variability for national and international commerce, and this national uniformity should be reflected by English material culture.

Dry Weight Systems

Of the 29 English dry weight systems identified (Table 2), seven can be regarded as systems of major importance (Figure 3); three presumed systems, based upon secondary dry capacity standards and probably used in the weighing of wheat, were of insignificant importance for the weighing of other commercial commodities; and the remaining 19 systems were based upon the seven major systems.

The two primary standards for the seven major systems were the *wheat* and *Troy grains* of 0.04556 g and 0.0648 g, respectively. These standards were physically embodied within each dry weight system by a larger unit known as a *pound*, with each *pound* being identified by the total number of *wheat* and/or *Troy grains* it contained. Unfortunately, few *pound* standards survived into more recent times, thus denying modern scholars an opportunity to check the accuracy of earlier systems. In fact, the question of weight variability for *wheat* and *Troy grains* through time has never been completely addressed, and it is highly likely that physical *pound* standards maintained by the Crown and various merchant guilds varied considerably in relationship to their mathematical counterparts. From this observation it is inferred that metrological systems identify mathematical relationships among metrological units, but the physical units of a system will not always equate in size or mass with their corresponding metrological units.

Thus, metric weights given in the following tables must be regarded as approximate weights which undoubtedly varied within the real marketplace. For comparative historical archaeological purposes, recognition of the relative weight ratios among the seven major systems is essential. The *Tower pound* was the lightest of all, with the *Haverdepoise pound* being the heaviest (Table 3).

Table 2. English dry weight systems and their known period of usage (*presumed system).

ENGLISH DRY WEIGHT SYSTEMS	PERIOD IN USE
Tower Pound	791 - 1527
Merchants' Pound	1266 - 1527
Hanseatic Merchants' Pound	pre-13th C - 1582
Avoir-du-pois Pound	1340 - 1582
Avoir-du-pois Wool	
Avoir-du-pois Hay	
Avoir-du-pois Coal	
Haverdepoise Merchants' Pound	1497 - 1582
Henry VII Winchester Corn*	1497 - 1601
Troy Pound	1497 - 20th C
Troy Corn	
Troy Imaginary Mint	
Troy Pound Carat	
Troy Ounce Carat	
Jewellers'	
Apothecary	
Avoirdupois Pound	1582 - 20th C
Avoirdupois Wool	
Avoirdupois New Hay	
Avoirdupois Old Hay	
Avoirdupois Straw	
Avoirdupois Coal	
Avoirdupois Salt	
Avoirdupois Lead	
Avoirdupois Stannary	
Avoirdupois Gunpowder	
Avoirdupois Glass	
Elizabeth I Winchester Corn*	1601 - 1702
William III Winchester Corn*	1702 - 1826

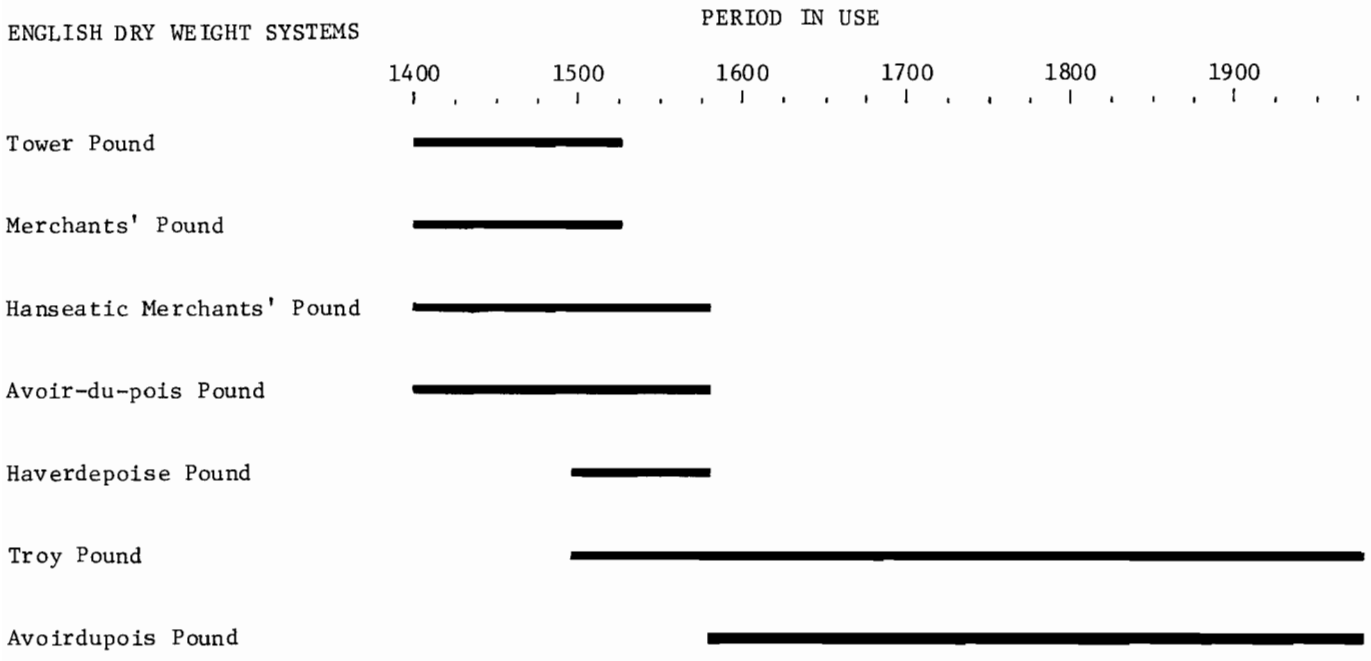

Figure 3. Comparison of the major English dry weight systems and their period of usage (post-1400).

Table 3. Comparison of weights among the seven major English dry weight *pounds* in use during the 15th through 19th centuries.

ENGLISH DRY WEIGHT POUNDS	TROY POUNDS	GRAMS
Tower Pound	5400	349.92
Troy Pound	5760	373.248
Merchants' Pound	6750	437.40
Avoir-du-pois Pound	6992	453.0816
Avoirdupois Pound	7000	453.60
Hanseatic Merchants' Pound	7200	466.56
Haverdepoise Pound	7680	497.664

Utilizing these relative weight relationships among the seven major systems, artifacts can be weighed and compared to expected weights in order to postulate original cultural metrological units. For example, if an axe head found within a 19th-century context weighed 1810 g, it could be postulated that on the basis of its weight alone, the axe head was manufactured in a country using the Avoirdupois Pound Weight System, since its weight corresponds to four *Avoirdupois pounds*. For Canadian historical archaeological sites, this comparative approach could be used to distinguish material culture manufactured by English vs. French tradesmen. Similar examples of weight variations for material culture could also assist in the ascription of the temporal period of manufacture and in the identification of specific dry weight systems used in the manufacture of specific classes of commodities. From these observations, it is inferred that object measurements used to identify metrological units and systems can also be utilized to ascribe both cultural and temporal affiliations.

TOWER POUND WEIGHT SYSTEM (791 - 1527)

The *Moneyer's* or *Saxon pound* (791 - 1066) or *Moneyer's Tower pound* (1066 - 1527) was defined by Offa, Anglo-Saxon King of Mercia (757 - 796) in 791 on the basis of the *Arabic silver half dirhem* of 22-23 *grains* and officially abolished in 1527 by Henry VIII. The *Tower pound* was incorrectly identified as a *Troy pound* on a 1746 broadside purportedly taken from the Table of Standard Weights and Measures of the Exchequer for 1497 (Standard... 1746). This table was prepared from weights given in Skinner 1967 and Zupko 1977: 11 and 78. NOTE: The modern *grain* of amber durum wheat weighs between 0.0421-0.0439 g (Canadian Grain Commission 1978).

METRIC

0.04556	g	1 *Wheat Grain*						
0.0648	g	1.422...	1 *Troy Grain*					
1.458	g	32	22.5	1 *Pennyweight*				
29.16	g	640	450	20	1 *Tower Ounce*			
349.92	g	7680	5400	240	12	1 *Tower Pound*		
2.7994	kg	61,440	43,200	1920	96	8	1 *Tower Gallon*	
22.3949	kg	491,520	345,600	15,360	768	64	8	1 *Tower Bushel*

MERCHANTS' POUND WEIGHT SYSTEM (in Britain, 1266 - 1527)

The *Merchants' pound* was in use among southern German cities and was officially enacted in Britain in 1266 by Henry III and abolished in 1527 by Henry VIII. This table was prepared from weights given in Skinner 1967 and Zupko 1977.

METRIC

0.04556 g	1 *Wheat Grain*							
0.0648 g	1.422...	1 *Troy Grain*						
1.458 g	32	22.5	1 *Pennyweight*					
29.16 g	640	450	20	1 *Tower Ounce*				
437.4 g	9600	6750	300	15	1 *Merchants' Pound*			
3.4992 kg	76,800	54,000	2400	120	8	1 *Gallon*		
27.9936 kg	614,400	432,000	19,200	960	64	8	1 *Bushel*	

HANSEATIC MERCHANTS' POUND WEIGHT SYSTEM (in Britain, pre-13th century - 1582)

The *Hanseatic Merchants' pound* was in use among northern German and Baltic coastal cities prior to its use by the Hanseatic merchants of London during the 13th century. It was officially replaced in 1582 by Elizabeth I. This table was prepared from weights given in Moody 1960, Skinner 1967 and Zupko 1977.

METRIC

0.04556 g	1 *Wheat Grain*							
0.0648 g	1.422...	1 *Troy Grain*						
1.458 g	32	22.5	1 *Pennyweight*					
29.16 g	640	450	20	1 *Tower Ounce*				
466.56 g	10,240	7200	320	16	1 *Hanseatic Merchants' Pound*			
3.7325 kg	81,920	57,600	2560	128	8	1 *Gallon*		
29.8598 kg	655,360	460,800	20,480	1024	64	8	1 *Bushel*	

AVOIR-DU-POIS POUND WEIGHT SYSTEM (1340 - 1582)

The *Avoir-du-pois pound* of Edward III was established in 1340 and was replaced in 1582 by Elizabeth I. This table was prepared from weights given in Skinner 1967 and Zupko 1977.

METRIC

0.04556	g	1	*Wheat Grain*						
0.0648	g	1.422...	1	*Troy Grain*					
28.3176	g	621.5	437	1	*Avoir-du-pois Ounce*				
113.2704	g	2486	1748	4	1	*Quarter Pound*			
226.5408	g	4972	3496	8	2	1	*Half Pound*		
453.0816	g	9944	6992	16	4	2	1	*Avoir-du-pois Pound*	

AVOIR-DU-POIS WOOL WEIGHT SYSTEM (1352 - 1582)

This system was based upon the *Avoir-du-pois pound* established in 1352 and replaced in 1582, and was used in the national commerce of wool. This table was prepared from weights given in Skinner 1967 and Zupko 1977: 157.

METRIC

453.0816	g	1	*Avoir-du-pois Pound*							
3.1716	kg	7	1	*Clove* or *Nail*						
6.3431	kg	14	2	1	*Stone*					
12.6863	kg	28	4	2	1	*Tod*				
41.2304	kg	91	13	6.5	3.25	1	*Quarter Sack*			
82.4609	kg	182	26	13	6.5	2	1	*Half Sack* or *Wey*		
164.9217	kg	364	52	26	13	4	2	1	*Sack*	
329.8434	kg	728	104	52	26	8	4	2	1	*Sarpler*
1.9791	mt	4368	624	312	156	48	24	12	6	1 *Last*

AVOIR-DU-POIS HAY WEIGHT SYSTEM (1352 - 1582)

This presumed system was based upon the *Avoir-du-pois pound* established in 1352 and replaced in 1582, and was used in the national commerce of hay. This table was prepared from weights given in Zupko 1977: 156.

METRIC						
453.0816	g	1	*Avoir-du-pois Pound*			
25.3726	kg	56	1	*Truss*		
913.412	kg	2016	36	1	*Load*	

AVOIR-DU-POIS COAL WEIGHT SYSTEM (1352 - 1582)

This hypothesized system may have been established when the *Avoir-du-pois pound* was officially defined in 1352. Zupko (1977: 151) stated that an "Avoirdupois" coal system was in use 1421 - 1676. However, the *Avoirdupois pound* was not adopted until 1582, so an earlier system based upon the older *Avoir-du-pois pound* may have existed.

METRIC						
453.0816	g	1	*Avoir-du-pois Pound*			
28.32	kg	62.5	1	*Bushel*		
907.16	kg	2000	32	1	*Chalder*	
18.12	mt	40,000	640	20	1	*Keel*

HAVERDEPOISE MERCHANTS' POUND WEIGHT SYSTEM (1497 - 1582)

The *Haverdepoise Merchants' pound* of Henry VII was established on the basis of 7680 *Troy grains*, and was designed to weigh ordinary merchandise other than gold, silver and bread. It was replaced in 1582 by Elizabeth I. This table was prepared from weights given in Skinner 1967.

METRIC

0.0648	g	1	*Troy Grain*			
1.5552	g	24	1	*Pennyweight*		
31.104	g	480	20	1	*Troy Ounce*	
497.664	g	7680	320	16	1	*Haverdepoise Merchants' Pound*

HENRY VII WINCHESTER CORN WEIGHT SYSTEM (1497 - 1601)

This presumed system is based upon the *bushel* and *gallon* dry capacity standards measuring 2144.81 *cubic inches* and 268.43 *cubic inches*, respectively, established by Henry VII in 1497. According to Statute 12 Henry VII 1496, a *pint* of wheat was equal to an eighth *gallon* and weighed 12 1/2 *Troy ounces*. This system was altered with the development of the new *bushel* and *gallon* standards of Elizabeth I. This table was prepared from weights given in Skinner 1967: 100, 105.

METRIC

31.104	g	1	*Troy Ounce*									
97.2	g	3.125	1	*Gill*								
388.8	g	12.5	4	1	*Pint*							
777.6	g	25	8	2	1	*Quart*						
1.5552	kg	50	16	4	2	1	*Pottle*					
3.1104	kg	100	32	8	4	2	1	*Gallon*				
6.2208	kg	200	64	16	8	4	2	1	*Peck*			
24.8832	kg	800	256	64	32	16	8	4	1	*Bushel*		
99.5328	kg	3200	1024	256	128	64	32	16	4	1	*Coom*	
199.0656	kg	6400	2048	512	256	128	64	32	8	2	1	*Quarter*
995.328	kg	32,000	10,240	2560	1280	640	320	160	40	10	5	1 *Wey, Ton* or *Load*
1.991	mt	64,000	20,480	5120	2560	1280	640	320	80	20	10	2 1 *Last*

TROY POUND WEIGHT SYSTEM (1497 - present)

The *Troy pound* was in use in Britain by at least 1414 and was officially adopted by Henry VII in 1497 for precious metals, coinage and bread. The system continues in use to this day, albeit minus those units greater than the *Troy ounce* which were abolished by the Weights and Measures Act of 1878. This table was prepared from weights given in Standard... 1746, Good et al. 1813, Irwin 1960, Moody 1960, Skinner 1967, Dresner 1972 and Zupko 1977.

METRIC											
0.0648	g	1 *Troy Grain*									
1.5552	g	24	1 *Pennyweight*								
31.104	g	480	20	1 *Troy Ounce*							
373.248	g	5760	240	12	1 *Troy Pound* and *Pint*						
746.496	g	11,520	480	24	2	1 *Quart*					
1.493	kg	23,040	960	48	4	2	1 *Pottle*				
2.986	kg	46,080	1920	96	8	4	2	1 *Gallon*			
23.888	kg	368,640	15,360	768	64	32	16	8	1 *Bushel*		
37.325	kg	576,000	24,000	1200	100	50	25	12.5	1.5625	1 *Hundredweight*	
191.103	kg	2,949,120	122,880	6144	512	256	128	64	8	5.12	1 *Quarter*
746.496	kg	11,520,000	480,000	24,000	2000	1000	500	250	31.25	20	3.90625 1 *Ton*

TROY CORN WEIGHT SYSTEM (post-1497 - ?)

A system for measuring wheat as reported by Postlethwayt 1774.

METRIC									
373.248	g	1 *Pint* or *Pound*							
2.9860	kg	8	1 *Gallon*						
5.9720	kg	16	2	1 *Peck*					
23.8879	kg	64	8	4	1 *Bushel*				
47.7757	kg	128	16	8	2	1 *Strike*			
95.5515	kg	256	32	16	4	2	1 *Coomb*		
191.1030	kg	512	64	32	8	4	2	1 *Quarter*	
1.147	mt	3072	384	192	48	24	12	6	1 *Wey*
1.911	mt	5120	640	320	80	40	20	10	1.666... 1 *Last*

TROY IMAGINARY MINT WEIGHT SYSTEM (post-1497 - ?)

This is one system reported by Doursther (1840) for the calculation of precious metal weights.

METRIC

0.0002343	mg	1	*Blank*				
0.0056243	mg	24	1	*Periot*			
0.1349834	mg	576	24	1	*Droit*		
3.239601	mg	13,824	576	24	1	*Mite*	
64.79202	mg	276,480	11,520	480	20	1	*Troy Grain*

TROY IMAGINARY MINT WEIGHT SYSTEM (post-1497 - ?)

This is one system reported by Zupko (1977: 157) for the calculation of precious metal weights.

METRIC

0.0002812	mg	1	*Blank*				
0.0067492	mg	24	1	*Perit*			
0.1349834	mg	480	20	1	*Droit*		
3.239601	mg	11,520	480	24	1	*Mite*	
64.79202	mg	230,400	9600	480	20	1	*Troy Grain*

TROY POUND CARAT WEIGHT SYSTEM (post-1497 - ?)

A system used by gold and silver refiners, as reported by Postlethwayt (1774).

NOTE: A *carat* equals 1/24th part of any given weight, and for this system a *carat* equals 1/24th part of a *pound*.

METRIC								
0.0648	g	1	*Troy Grain*					
0.972	g	15	1	*Quarter*				
3.888	g	60	4	1	*Grain*			
15.552	g	240	16	4	1	*Carat*		
31.104	g	480	32	8	2	1	*Ounce*	
373.248	g	5760	384	96	24	12	1	*Pound*

OUNCE CARAT WEIGHT SYSTEM (post-1497 - ?)

A system used by gold and silver refiners, as reported by Postlethwayt (1774).

NOTE: A *carat* equals 1/24th part of any given weight, and for this system a *carat* equals 1/24th part of an *ounce*.

METRIC						
0.0648	g	1	*Troy Grain*			
0.081	g	1.25	1	*Quarter*		
0.324	g	5	4	1	*Grain*	
1.296	g	20	16	4	1	*Carat*
31.104	g	480	384	96	24	1 *Ounce*

JEWELLERS' WEIGHT SYSTEM (post-1497 - ?)

A system used by jewellers for weighing jewels and other precious stones, reported by Postlethwayt (1774).

NOTE: In this system a *carat* does not correspond to the standard definition of 1/24th part of a given weight.

METRIC							
0.0032 g	1 *Sixty-fourth Carat*						
0.0064 g	2	1 *Thirty-second Carat*					
0.0128 g	4	2	1 *Sixteenth Carat*				
0.0256 g	8	4	2	1 *Eighth Carat*			
0.0512 g	16	8	4	2	1 *Grain*		
0.2046 g	64	32	16	8	4	1 *Carat*	
31.104 g	9728	4864	2432	1216	608	152	1 *Troy Ounce*

APOTHECARY WEIGHT SYSTEM (post-1497 - 20th century)

Apothecary weights were based upon the Troy Pound System as established by Henry VII, and were eventually replaced by the Metric Weight System. This table was prepared from weights given in Good et al. 1816, Phillips 1848, Irwin 1960 and Dresner 1972.

METRIC						
0.0648 g	1 *Troy Grain*					
1.296 g	20	1 *Scruple*				
3.888 g	60	3	1 *Dram*			
31.104 g	480	24	8	1 *Troy Ounce*		
373.248 g	5760	288	96	12	1 *Troy Pound*	

AVOIRDUPOIS POUND WEIGHT SYSTEM (1582 - present)

The *Avoirdupois pound* of 7000 *grains* was established in 1582 by Elizabeth I to replace the two remaining *Merchants' Pound* systems still in use in Britain (i.e. the *Avoir-du-pois* and *Haverdepoise* pound systems). In 1840 the *Avoirdupois pound* was given as 453.544123364 g (Doursther 1840: 214), but the British standard weighed in 1844 was found to be 453.59265 g (Judson 1976: 17). This table was prepared from weights given in Good et al. 1813, Doursther 1840, Irwin 1960, Moody 1960, Skinner 1967, Dresner 1972 and Judson 1976.

METRIC												
0.0648	g	1 *Troy Grain*										
0.5906	g	9.114...	1 *Scruple*									
1.7719	g	27.34375	3	1 *Dram*								
28.35	g	437.5	48	16	1 *Avoirdupois Ounce*							
453.6	g	7000	768	256	16	1 *Avoirdupois Pound*						
6.3504	kg	98,000	10,752	3584	224	14	1 *Stone*					
12.7008	kg	196,000	21,504	7168	448	28	2	1 *Quarter*				
45.36	kg	700,000	76,800	25,600	1600	100	7.142...	3.571...	1 *Cental* or *Short Hundredweight*			
50.8032	kg	784,000	86,016	28,672	1792	112	8	4	1.12	1 *Hundredweight* or *Quintal*		
907.2	kg	14,000,000	1.536,000	512,000	32,000	2000	142.857...	71.428...	20	17.857...	1 *Short Ton*	
1.016	mt	15,680,000	1,720,320	573,440	35,840	2240	160	80	22.4	20	1.12	1 *Long Ton*

AVOIRDUPOIS WOOL WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of wool. This table was prepared from weights given in Postlethwayt 1774, Blunt 1851: 380 and Zupko 1977: 157. NOTE: *Cloves* varied between 7-10 *Avoirdupois pounds*, *stones* varied between 7-20 *Avoirdupois pounds* and *tods* varied between 20-40 *Avoirdupois pounds*.

METRIC										
453.6	g	1 *Avoirdupois Pound*								
3.1752	kg	7	1 *Clove* or *Nail*							
6.3504	kg	14	2	1 *Stone*						
9.072	kg	20	2.857...	1.428...	1 *Score*					
12.7008	kg	28	4	2	1.4	1 *Tod*				
54.432	kg	120	17.142...	8.571...	6	4.285...	1 *Pack*			
82.5552	kg	182	26	13	9.1	6.5	1.516...	1 *Wey*		
165.1104	kg	364	52	26	18.2	13	3.033...	2	1 *Sack*	
330.2208	kg	728	104	52	36.4	26	6.066...	4	2	1 *Sarpler*
1.981	mt	4368	624	312	218.4	156	36.4	24	12	6	1 *Last*

AVOIRDUPOIS NEW HAY WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of new hay which was presumably baled before the first of September. This table was prepared from weights given in Zupko 1977: 156.

METRIC						
453.6	g	1	*Avoirdupois Pound*			
27.216	kg	60	1	*Truss*		
979.776	kg	2160	36	1	*Load*	

AVOIRDUPOIS OLD HAY WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of old hay, baled after the first of September (Blunt 1851: 380). This table was prepared from weights given in Zupko 1977: 156.

METRIC						
453.6	g	1	*Avoirdupois Pound*			
25.40	kg	56	1	*Truss*		
914.46	kg	2016	36	1	*Load*	

AVOIRDUPOIS STRAW WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of straw. This table was prepared from weights given in Doursther 1840: 70, Blunt 1851: 380 (error in text of 26 *trusses* to a *load*) and Zupko 1968: 174.

METRIC					
453.6	**g**	1	*Avoirdupois Pound*		
16.33	kg	36	1	*Truss*	
587.87	kg	1296	36	1	*Load*

AVOIRDUPOIS COAL WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of coal. Zupko (1977: 151), gives an initial date of 1676 for this system.

METRIC					
453.6 g	1	*Avoirdupois Pound*			
28.21 kg	62.5	1	*Bushel*		
1.016 mt	2250	36	1	*Chalder*	
16.25 mt	36,000	576	16	1	*Keel*

AVOIRDUPOIS SALT WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of salt. This table was prepared from weights given in Postlethwayt 1774.

METRIC									
453.6	g	1	*Avoirdupois Pound*						
3.1752	kg	7	1	*Gallon*					
25.4016	kg	56	8	1	*Bushel*				
50.8032	kg	112	16	2	1	*Hundredweight*			
127.008	kg	280	40	5	2.5	1	*Sack*		
203.2128	kg	448	64	8	4	1.6	1	*Quarter*	
1.0669	mt	2352	336	42	21	8.4	5.25	1	*Ton*

AVOIRDUPOIS LEAD WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of lead. This table was prepared from weights given in Postlethwayt 1774 and Zupko 1977: 56. Weight variations given by Blunt (1851: 380) demonstrate that the *lead fodder* ranged between 2184-2464 *pounds*.

METRIC							
453.6	g	1	*Avoirdupois Pound*				
5.67	kg	12.5	1	*Stone*			
31.752	kg	70	5.6	1	*Fotmal*		
79.38	kg	175	14	2.5	1	*Wey* or *Load*	
952.56	kg	2100	168	30	12	1	*Fother* or *Fodder*

AVOIRDUPOIS STANNARY WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of tin (Postlethwayt 1774).

METRIC				
453.6 g	1	*Avoirdupois Pound*		
54.432 kg	12	1	*Stannary Hundred*	

AVOIRDUPOIS GUNPOWDER WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of gunpowder (Postlethwayt 1774).

METRIC				
453.6 g	1	*Avoirdupois Pound*		
45.36 kg	100	1	*Barrel*	
1.089 mt	2400	24	1	*Last*

AVOIRDUPOIS GLASS WEIGHT SYSTEM (post-1582 - ?)

This system was based upon the *Avoirdupois pound* established 1582, and was used in the national commerce of glass (Blunt 1851: 380).

METRIC				
453.6 g	1	*Avoirdupois Pound*		
2.27 kg	5	1	*Stone*	
54.43 kg	120	24	1	*Seam*

ELIZABETH I WINCHESTER CORN WEIGHT SYSTEM (1601 - 1702)

This presumed system was based upon the *bushel* and *gallon* capacity standards measuring 2148.28 *cubic inches* and 268.97 *cubic inches*, respectively, established by Elizabeth I in 1601 as replacements for the standards established in 1497 by Henry VII. Based upon the bulk densities of wheat as calculated from the standards of Henry VII, these hypothesized *bushel* and *gallon* corn weights were 0.2% and 0.16% greater than those of Henry VII. Elizabeth's standards were replaced in 1702 by William III. Skinner (1967: 105) noted that a second *gallon* capacity standard of 270.59 *cubic inches* made during the reign of Elizabeth I was incorrectly regarded in 1758 as the primary standard. This presumed system follows the weight units defined by Henry VII.

METRIC												
97.4	g	1	*Gill*									
389.6	g	4	1	*Pint*								
779.2	g	8	2	1	*Quart*							
1.5583	kg	16	4	2	1	*Pottle*						
3.1166	kg	32	8	4	2	1	*Gallon*					
6.2333	kg	64	16	8	4	2	1	*Peck*				
24.9234	kg	256	64	32	16	8	4	1	*Bushel*			
99.6935	kg	1024	256	128	64	32	16	4	1	*Coom*		
199.3877	kg	2048	512	256	128	64	32	8	2	1	*Quarter*	
996.935	kg	10,240	2560	1280	640	320	160	40	10	5	1	*Wey, Ton* or *Load*
1.994	mt	20,480	5120	2560	1280	640	320	80	20	10	2	1 *Last*

WILLIAM III WINCHESTER CORN WEIGHT SYSTEM (1702 - 1826)

This presumed system was based upon the *bushel* capacity standard measuring 2150.42 *cubic inches* established by William III in 1702 as a replacement for the *bushel* and *gallon* capacity standards established by Elizabeth I in 1601 (Skinner 1967: 105). Based upon the bulk densities of wheat as calculated from the standards of Henry VII, the *bushel* corn weights of William III was 0.1% greater than that for Elizabeth I and 0.26% greater than that for Henry VII. This system was abolished with the adoption of the Imperial system. This presumed system follows the weight units defined by Henry VII.

METRIC

97.3	g	1 *Gill*									
389.3	g	4	1 *Pint*								
778.7	g	8	2	1 *Quart*							
1.5573	kg	16	4	2	1 *Pottle*						
3.1147	kg	32	8	4	2	1 *Gallon*					
6.2294	kg	64	16	8	4	2	1 *Peck*				
24.9483	kg	256	64	32	16	8	4	1 *Bushel*			
99.7933	kg	1024	256	128	64	32	16	4	1 *Coom*		
199.5859	kg	2048	512	256	128	64	32	8	2	1 *Quarter*	
997.933	kg	10,240	2560	1280	640	320	160	40	10	5	1 *Wey, Ton* or *Load*
1.996	mt	20,480	5120	2560	1280	640	320	80	20	10	2 1 *Last*

Liquid Weight Systems

Only two English liquid weight systems were utilized, and both were defined on the basis of secondary standards taken from liquid capacity systems (Table 4). Both systems were used exclusively in the commerce and dispensing of liquid medicines.

Table 4. English liquid weight systems, their known period of usage, and their standard *gallon* weights.

ENGLISH LIQUID WEIGHT SYSTEMS	PERIOD OF USE	GALLON (g)
Winchester Wine Apothecary	pre-1707 - 1826	3779
Imperial Apothecary	1826 - ?	4536

WINCHESTER WINE APOTHECARY LIQUID WEIGHT SYSTEM (pre-1707 - 1826)

This system was based upon the Queen Anne Winchester *wine gallon* measuring 231.0 *cubic inches* holding approximately eight *Hanseatic Merchants' pounds* of water. The origins of this system remain unknown, but it would appear to have existed prior to the abolition of the *Hanseatic Merchants' pound* in 1522. This system was used to weigh liquid pharmaceuticals and was abolished with the adoption of the Imperial system (Phillips 1848).

METRIC							
0.0615	g	1	*Minim*				
3.6904	g	60	1	*Fluiddrachm*			
29.5235	g	480	8	1	*Fluidounce*		
472.3758	g	7680	128	16	1	*Pint*	
3779.0064	g	61,440	1024	128	8	1	*Gallon*

IMPERIAL APOTHECARY LIQUID WEIGHT SYSTEM (1826 - ?)

This system was based upon the *Imperial gallon*, defined in 1824, measuring 277.27 *cubic inches* and holding 10 *Avoirdupois pounds* of water weighed at 62° F at 30 *inches* of barometric pressure. This table was prepared from weights given in Phillips 1848.

METRIC							
0.591	g	1	*Minim*				
3.5438	g	60	1	*Fluidrachm*			
28.35	g	480	8	1	*Fluidounce*		
567.00	g	9600	160	20	1	*Pint*	
4536.00	g	76,800	1280	160	8	1	*Gallon*

Dry Capacity Systems

Of the five English dry capacity systems identified, four can be regarded as major systems, with the one remaining system being based upon one of the four major systems (Table 5).

Table 5. English dry capacity systems, their known period of usage, and their standard *gallon* and *bushel* capacities.

ENGLISH DRY CAPACITY SYSTEMS	PERIOD OF USE	GALLON (1)	BUSHEL (1)
Henry VII Winchester	1497 - 1601	4.398	35.145
Elizabeth I Winchester	1601 - 1702	4.407	35.202
William III Winchester	1702 - 1826	4.405	35.237
Imperial	1826 - 20th C	4.543	36.348
Imperial Coal			

The *gallon* and *bushel* standards for the Henry VII and Elizabeth I Winchester Corn Capacity systems did not mathematically equal the 1:8 ratio expressed within their systems. In each system the *gallon* capacity was slightly greater than its corresponding one-eighth *bushel* capacity. Thus, the *Henry VII Winchester gallon* was 0.12% greater and the *Elizabeth I Winchester gallon* was 0.16% greater than their corresponding one-eighth *bushel* capacities. From this observation it is inferred that metrological unit standards may not equate with related unit standards within the same metrological system.

The Winchester capacity systems were originally designed to measure wheat (i.e. what the English refer to as "corn"), but any dry commodity could be similarly measured. The various Winchester *gallon* and *bushel* measures were also used as primary standards for liquid capacity, and possibly as secondary standards for dry weight, systems. The Imperial Dry Capacity System was based upon a standard defined in terms of the cubic capacity of a given weight of water, and thus this dry capacity system is partially based upon a secondary standard of mass. From these observations it is inferred that metrological units and systems designed for one type of measurement system can also be used for other types of measurement systems.

HENRY VII WINCHESTER CORN CAPACITY SYSTEM (1497 - 1601)

This system was based upon the *bushel* and *gallon* standards measuring 2144.81 *cubic inches* and 268.43 *cubic inches*, respectively, established by Henry VII, and replaced by Elizabeth I. This table was prepared from capacities given in Skinner 1967: 105.

METRIC												
137.45	ml	1 *Gill*										
549.82	ml	4	1 *Pint*									
1099.63	ml	8	2	1 *Quart*								
2199.27	ml	16	4	2	1 *Pottle*							
4398.5377	ml	32	8	4	2	1 *Gallon*						
8.797	l	64	16	8	4	2	1 *Peck*					
35.145206	l	256	64	32	16	8	4	1 *Bushel*				
140.581	l	1024	256	128	64	32	16	4	1 *Coom*			
281.162	l	2048	512	256	128	64	32	8	2	1 *Quarter*		
1405.81	l	10,240	2560	1280	640	320	160	40	10	5	1 *Wey, Tun* or *Load*	
2811.62	l	20,480	5120	2560	1280	640	320	80	20	10	2	1 *Last*

ELIZABETH I WINCHESTER CORN CAPACITY SYSTEM (1601 - 1702)

This system was based upon the *bushel* and *gallon* standards measuring 2148.28 *cubic inches* and 268.97 *cubic inches*, respectively, established by Elizabeth I as replacements for the standard of Henry VII. These standards were subsequently replaced by William III. Skinner (1967: 105) noted that the *gallon* standard of Elizabeth I was incorrectly regarded as the primary standard in 1758.

METRIC												
137.73	ml	1 *Gill*										
550.92	ml	4	1 *Pint*									
1101.85	ml	8	2	1 *Quart*								
2203.69	ml	16	4	2	1 *Pottle*							
4407.3863	ml	32	8	4	2	1 *Gallon*						
8.815	l	64	16	8	4	2	1 *Peck*					
35.202066	l	256	64	32	16	8	4	1 *Bushel*				
140.808	l	1024	256	128	64	32	16	4	1 *Coom*			
281.617	l	2048	512	256	128	64	32	8	2	1 *Quarter*		
1408.08	l	10,240	2560	1280	640	320	160	40	10	5	1 *Wey, Tun* or *Load*	
2816.17	l	20,480	5120	2560	1280	640	320	80	20	10	2	1 *Last*

WILLIAM III WINCHESTER CORN CAPACITY SYSTEM (1702 - 1826)

This system was based upon the *bushel* standard measuring 2150.42 *cubic inches* established by William III as a replacement for the bushel and *gallon* standards of Elizabeth I. This system was subsequently replaced by the Imperial Dry Capacity System. This table was prepared from capacities given in Martin 1794: 27, Good et al. 1813, Dourstther 1840, Loudon 1871 and Skinner 1967: 105.

METRIC

137.65	ml	1 *Gill*											
550.58	ml	4	1 *Pint*										
1101.16	ml	8	2	1 *Quart*									
2202.32	ml	16	4	2	1 *Pottle*								
4404.6416	ml	32	8	4	2	1 *Gallon*							
8.809	l	64	16	8	4	2	1 *Peck*						
35.237133	l	256	64	32	16	8	4	1 *Bushel*					
70.474	l	512	128	64	32	16	8	2	1 *Strike*				
140.949	l	1024	256	128	64	32	16	4	2	1 *Coom*			
281.897	l	2048	512	256	128	64	32	8	4	2	1 *Quarter*		
1409.49	l	10,240	2560	1280	640	320	160	40	20	10	5	1 *Wey, Tun* or *Load*	
2818.97	l	20,480	5120	2560	1280	640	320	80	40	20	10	2	1 *Last*

IMPERIAL DRY CAPACITY SYSTEM (1826 - present)

This system was defined by an act of Parliament in 1824, and officially adopted 1 January 1826. The *Imperial gallon* was to be that volume equal to 10 *Avoirdupois pounds* of distilled water weighed in air at the temperature of 62° F at a barometric pressure of 30 inches of mercury. It was further defined as 277.274 *cubic inches*, but in 1931-32 this capacity was correctly determined as 277.421 *cubic inches*. This table was prepared from capacities given in Doursther 1840, Loudon 1871 and Skinner 1967.

METRIC												
283.97	ml	1 *Half Pint*										
567.93	ml	2	1 *Pint*									
1135.86	ml	4	2	1 *Quart*								
4543.457	ml	16	8	4	1 *Gallon*							
9.087	l	32	16	8	2	1 *Peck*						
36.348	l	128	64	32	8	4	1 *Bushel*					
72.695	l	256	128	64	16	8	2	1 *Strike*				
145.391	l	512	256	128	32	16	4	2	1 *Coom*			
290.781	l	1024	512	256	64	32	8	4	2	1 *Quarter* or *Seam*		
1453.91	l	5120	2560	1280	320	160	40	20	10	5	1 *Tun* or *Wey*	
2907.81	l	10,240	5120	2560	640	320	80	40	20	10	2	1 *Last*

IMPERIAL COAL CAPACITY SYSTEM (1826 - present)

This system was based upon the Imperial Dry Capacity System. This table was prepared from capacities given in Blunt 1851: 364 (NOTE: Blunt incorrectly listed the *sack* as containing 12 *bushels*, rather than 12 *pecks* or three *bushels*).

METRIC							
9.087	1	1 *Peck*					
36.348	1	4	1 *Bushel*				
109.044	1	12	3	1 *Sack*			
327.132	1	36	9	3	1 *Vat*		
1308.528	1	144	36	12	4	1 *Chaldron*	

Liquid Capacity Systems

Of the nine English liquid capacity systems identified, eight can be regarded as major systems, with the one remaining system being based upon one of the eight major systems (Table 6).

Table 6. English liquid capacity systems, their known period of usage, and their standard *gallon* capacities.

ENGLISH LIQUID CAPACITY SYSTEMS	PERIOD OF USE	GALLON (1)
Henry III Merchants' Wine	1266 - 1707	3.670
Henry VII Winchester Wine and Ale	1497 - 1601	4.398
Elizabeth I Winchester Wine and Ale	1601 - 1826	4.407
Queen Anne Winchester Wine	pre-1707 - 1826	3.785
Ale	? - 1803	4.621
Beer	? - 1826	4.621
Ale and Beer	1688 - 1803	?
Imperial	1826 - 20th C	4.455
Imperial Culinary		-

The earlier systems were established in order to regulate the trade in fermented beverages, but they were also used to measure any commercial liquid. As can be seen in Table 4, the *gallon* capacities of these systems varied between 3.670-4.621 l; and as many as seven systems could have been in cultural use simultaneously. In 1707, Queen Anne attempted to codify one of the existing *gallon* standards as the official unit of liquid measure, but because of its relatively small size, this unit did not replace the larger *gallon* units commonly used in beer and ale commerce. In 1826, with the adoption of the Imperial standard, a single uniform *gallon* standard was again codified, but it required many generations for the Imperial Liquid Capacity System to totally replace the Queen Anne Winchester Wine Gallon System. From this observation it is inferred that for any given type of measurement system (e.g. liquid capacity, liquid weight, dry capacity, etc.), multiple metrological systems can be simultaneously employed by a society, reflecting either contemporaneous usages for measuring multiple commodity classes, or anachronistic usages for measuring a single commodity class, presumably reflecting idiosyncratic-communal preferences which are regionally derived.

HENRY III MERCHANTS' WINE GALLON SYSTEM (1266 - 1707)

This hypothetical system was based upon the *Merchants' pound* of 15 *Tower ounces* with a *gallon* equalling eight *Merchants' pounds* of wheat as decreed by Henry III Royal Ordinance of 1266. Skinner (1967: 93) hypothesized that eight *Merchants' pounds* of wine would have given a *gallon* capacity of 216 *cubic inches*, but he observed that no such standard was ever noted. Berriman (1953: 163) noted that in 1688 the Guildhall of the City of London used a *wine gallon* standard of 224 *cubic inches* which would have equalled eight *Merchants' pounds* of wheat (i.e. if the wheat had a specific gravity of 0.953 g/cc), or eight *Avoir-du-pois pounds* of wine (i.e. if the wine had a specific gravity of 0.988 g/cc). This capacity of 224 *cubic inches* is taken as the correct wine gallon which remained in use until it was replaced by Queen Anne. The units noted for this system follow those used in the Queen Anne Winchester Wine Gallon System.

METRIC

28.68 ml	1 *Fluidounce*															
114.7 ml	4	1 *Gill*														
458.8 ml	16	4	1 *Pint*													
611.75 ml	21.333...	5.333...	1.333...	1 *Bottle*												
734.1 ml	25.6	6.4	1.6	1.2	1 *Reputed Quart* **(?)**											
917.63 ml	32	8	2	1.5	1.25	1 *Quart*										
3670.5 ml	128	32	8	6	5	4	1 *Gallon*									
36.7 l	1280	320	80	60	50	40	10	1 *Anker*								
57.81 l	2016	504	126	94.5	78.75	63	15.75	1.575	1 *Octave*							
66.07 l	2304	576	144	108	90	72	18	1.8	1.142...	1 *Rundlet*						
115.62 l	4032	1008	252	189	157.5	126	31.5	3.15	2	1.75	1 *Barrel*					
154.16 l	5376	1344	336	252	210	168	42	4.2	2.666...	2.333...	1.333...	1 *Tierce*				
231.24 l	8064	2016	504	378	315	252	63	6.3	4	3.5	2	1.5	1 *Hogshead*			
308.32 l	10,752	2688	672	504	420	336	84	8.4	5.333...	4.666...	2.666...	2	1.333...	1 *Puncheon*		
462.48 l	16,128	4032	1008	756	630	504	126	12.6	8	7	4	3	2	1.5	1 *Butt* or *Pipe*	
924.97 l	32,256	8064	2016	1512	1260	1008	252	25.2	16	14	8	6	4	3	2	1 *Tun*

HENRY VII WINCHESTER WINE AND ALE GALLON SYSTEM (1497 - 1601)

This system was based upon the *gallon* capacity standard measuring 268.43 *cubic inches* established by Henry VII. According to Statute 12 Henry VII, 1496, a *pint* of wine and ale was to equal an eighth *gallon* and contain 12 1/2 *Troy ounces* of wheat. This system was altered with the development of new *bushel* and *gallon* standards by Elizabeth I. This table was prepared from capacities given in Skinner 1967: 100 and 105.

METRIC						
549.82	ml	1	*Pint*			
1099.63	ml	2	1	*Quart*		
2199.27	ml	4	2	1	*Pottle*	
4398.5377	ml	8	4	2	1	*Gallon*

ELIZABETH I WINE AND ALE GALLON SYSTEM (1601 - 1826)

This system was based upon the *gallon* standard measuring 268.97 *cubic inches* established by Elizabeth I as a replacement for the standard established by Henry VII. A second *gallon* standard measuring 270.59 *cubic inches* was apparently incorrectly regarded as the primary standard in 1758 (Skinner 1967: 105). In 1702 William III established a replacement for the Elizabeth I *bushel* standard, but not for the *gallon* standard. This system for wine was abolished in 1707 with the adoption of the Queen Anne Winchester *wine gallon*, and it was totally abolished in 1826 with the adoption of the Imperial Liquid Capacity System.

METRIC						
550.92	ml	1	*Pint*			
1101.85	ml	2	1	*Quart*		
2203.69	ml	4	2	1	*Pottle*	
4407.3863	ml	8	4	2	1	*Gallon*

QUEEN ANNE WINCHESTER WINE GALLON SYSTEM (pre-1707 - 1826)

This system was possibly in use as early as 1340, but it only became officially adopted by Queen Anne in 1707, and was based upon the *gallon* standard of 231.0 *cubic inches* which may have originally been based upon eight *Avoir-du-pois pounds* of wheat (i.e. if the wheat had a specific gravity of 0.958 g/cc). The official standard actually measured 230.824 *cubic inches*, not the purported 231.0 *cubic inches*. This system was abolished with the adoption of the Imperial Liquid Capacity System; however, it remained in use throughout the 19th century. This table was prepared from capacities given in Good et al. 1813, Doursther 1840, Phillips 1848, Funk 1926, Skinner 1967: 106 and Dresner 1972.

METRIC																		
0.0616	ml	1 *Minim*																
3.695	ml	60	1 *Fluiddrachm*															
29.57	ml	480	8	1 *Fluidounce*														
118.29	ml	1920	32	4	1 *Gill*													
473.15	ml	7680	128	16	4	1 *Pint*												
630.87	ml	10,240	170.666...	21.333...	5.333...	1.333...	1 *Bottle*											
757.04	ml	12,288	204.8	25.6	6.4	1.6	1.2	1 *Reputed Quart*										
946.30	ml	15,360	256	32	8	2	1.5	1.25	1 *Quart*									
3785.2037	ml	61,440	1024	128	32	8	6	5	4	1 *Gallon*								
37.85	l	614,400	10,240	1280	320	80	60	50	40	10	1 *Anker*							
59.62	l	967,680	16,128	2016	504	126	94.5	78.75	63	15.75	1.575	1 *Octave*						
68.13	l	1,105,920	18,432	2304	576	144	108	90	72	18	1.8	1.142...	1 *Rundlet*					
119.23	l	1,935,360	32,256	4032	1008	252	189	157.5	126	31.5	3.15	2	1.75	1 *Barrel*				
158.98	l	2,580,480	43,008	5376	1344	336	252	210	168	42	4.2	2.666...	2.333...	1.333...	1 *Tierce*			
238.47	l	3,870,720	64,512	8064	2016	504	378	315	252	63	6.3	4	3.5	2	1.5	1 *Hogshead*		
317.96	l	5,160,960	86,016	10,752	2688	672	504	420	336	84	8.4	5.333...	4.666...	2.666...	2	1.333...	1 *Puncheon* or *Tertian*	
476.94	l	7,741,440	129,024	16,128	4032	1008	756	630	504	126	12.6	8	7	4	3	2	1.5	1 *Butt* or *Pipe*
953.87	l	17,482,880	258,048	32,256	8064	2016	1512	1260	1008	252	25.2	16	14	8	6	4	3	2 1 *Tun*

ALE GALLON SYSTEM (? - 1803)

The origin of this system is unknown, and has been presumed to be pre-1340. It appears to have been based upon a beer gallon of approximately 10 *Avoir-du-pois pounds* (i.e. 4.530816 kg). According to Postlethwayt (1774) this system was based upon the *beer gallon* of 282 *cubic inches*, and according to Doursther (1840: 543) and Zupko (1977: 150) it was abolished 1803. This table was prepared from capacities given in Postlethwayt 1774, Doursther 1840, Berriman 1953 and Zupko 1977: 82 and 150.

METRIC

577.61	ml	1	*Pint*							
1155.22	ml	2	1	*Quart*						
4620.898	ml	8	4	1	*Gallon*					
36.97	l	64	32	8	1	*Firkin*				
73.93	l	128	64	16	2	1	*Kilderkin*			
147.87	l	256	128	32	4	2	1	*Barrel*		
221.80	l	384	192	48	6	3	1.5	1	*Hogshead*	
887.21	l	1536	768	192	24	12	6	4	1	*Tun*
1774.42	l	3072	1536	384	48	24	12	8	2	1 *Last*

BEER GALLON SYSTEM (? - 1826)

The origin of this system is unknown, but a beer system was mentioned in 1660 by Charles II, and it may have been in use during the early 14th century. This system appears to have been based upon a *beer gallon* consisting of approximately 10 *Avoir-du-pois pounds* (i.e. 4.530816 kg). By at least the mid-18th century, the *beer gallon* was defined on the basis of its cubic capacity of 282 *cubic inches*. According to Zupko (1977: 50), ale was also officially measured with this system after 1803. It was officially abolished with the adoption of the Imperial Liquid Capacity System. This table was prepared from capacities given in Postlethwayt 1774, Martin 1794, Good et al. 1813, Funk 1926, Berriman 1953, Johnson 1961, Moody 1960 and Zupko 1977.

METRIC

28.88	ml	1 *Fluidounce*													
144.40	ml	5	1 *Gill*												
577.61	ml	20	4	1 *Pint*											
770.15	ml	26.666...	5.333...	1.333...	1 *Bottle*										
924.18	ml	32	6.4	1.6	1.2	1 *Reputed Quart*									
1155.22	ml	40	8	2	1.5	1.25	1 *Quart*								
4620.898	ml	160	32	8	6	5	4	1 *Gallon*							
41.59	l	1440	288	72	54	45	36	9	1 *Firkin*						
83.18	l	2880	576	144	108	90	72	18	2	1 *Kilderkin*					
157.11	l	5440	1088	272	204	170	136	34	3.777...	1.888...	1 *Country Barrel*				
166.35	l	5760	1152	288	216	180	144	36	4	2	1.058...	1 *Barrel*			
249.53 - 332.70	l	8640 - 11,520	1728 - 2304	432 - 576	324 - 432	270 - 360	216 - 288	54 - 72	6 - 8	3 - 4	1.588...- 2.117...	1.5 - 2	1 *Hogshead*		
499.06	l	17,280	3456	864	648	540	432	108	12	6	3.176...	3 - 4	2	1 *Butt* or *Pipe*	
998.11	l	34,560	6912	1728	1296	1080	864	216	24	12	6.352...	6 - 8	4	2	1 *Tun*

ALE AND BEER GALLON SYSTEM (1688 - 1803)

In 1689 William III and Mary II decreed that 34 *gallons* would constitute a *barrel* of ale and beer (Postlethwayt 1774: Measures), but the exact capacity of this *gallon* remains unknown. Zupko (1977: 150) supplied capacity equivalents for this system, but they remain at odds with equivalents given by Postlethwayt (1774: England).

METRIC

-	1	*Pint*				
-	2	1	*Quart*			
-	8	4	1	*Gallon*		
-	272	136	34	1	*Barrel*	
-	408	204	51	1.5	1	*Hogshead*

IMPERIAL LIQUID CAPACITY SYSTEM (1826 - present)

This system was defined by act of Parliament in 1824 and was officially adopted on 1 January 1826. The *Imperial gallon* was equal to 10 *Avoirdupois pounds* of distilled water weighed in air at the temperature of 62° F at a barometric pressure of 30 *inches* of mercury. It was further defined as 277.274 *cubic inches*, but in 1931-32 the correct cubic capacity was found to be 277.421 *cubic inches*. This table was prepared from capacities given in Doursther 1840, Phillips 1848, Funk 1926, Irwin 1960, Moody 1960, Skinner 1967 and Dresner 1972.

METRIC																			
0.0592	ml	1 *Minim*																	
3.55	ml	60	1 *Fluiddrachm*																
28.40	ml	480	8	1 *Fluidounce*															
141.98	ml	2400	40	5	1 *Gill*														
567.93	ml	9600	160	20	4	1 *Pint*													
757.24	ml	12,800	213.333...	26.666...	5.333...	1.333...	1 *Bottle*												
906.69	ml	15,360	256	32	6.6	1.6	1.2	1 *Reputed Quart* **(?)**											
1135.86	ml	19,200	320	40	8	2	1.5	1.25	1 *Quart*										
2271.73	ml	38,400	640	80	16	4	3	2.5	2	1 *Pottle* or *Stoup*									
4545.457	ml	76,800	1280	160	32	8	6	5	4	2	1 *Gallon*								
20.45	l	345,600	5760	720	144	36	27	22.5	18	9	4.5	1 *Pin*							
40.89	l	691,200	11,520	1440	288	72	54	45	36	18	9	2	1 *Firkin*						
81.78	l	1,382,400	23,040	2880	576	144	108	90	72	36	18	4	2	1 *Kilderkin*					
163.56	l	2,764,800	46,080	5760	1152	288	216	180	144	72	36	8	4	2	1 *Barrel*				
245.35	l	4,147,200	69,120	8640	1728	432	324	270	216	108	54	12	6	3	1.5	1 *Hogshead*			
327.13	l	5,529,600	92,160	11,520	2304	576	432	360	288	144	72	16	8	4	2	1.333...	1 *Puncheon*		
490.69	l	8,294,400	138,240	17,280	3456	864	648	540	432	216	108	24	12	6	3	2	1.5	1 *Butt*	
981.39	l	16,588,800	276,480	34,560	6912	1728	1296	1080	864	432	216	48	24	12	6	4	3	2	1 *Tun*

IMPERIAL CULINARY LIQUID CAPACITY SYSTEM (1826 - present)

This system was based upon the Imperial Liquid Capacity System and was used in cooking (Zupko 1977: 165).

METRIC								
3.55	ml	1	*Teaspoon* or *Fluid Dram*					
7.1	ml	2	1	*Dessertspoon*				
14.2	ml	4	2	1	*Tablespoon*			
28.4	ml	8	4	2	1	*Fluidounce*		
71.0	ml	20	10	5	2.5	1	*Wine Glass*	
142.0	ml	40	20	10	5	2	1	*Teacup*
284.0	ml	80	40	20	10	4	2	1 *Tumbler*

Linear Systems

Of the six English linear systems identified, two may be considered major systems and the remaining six minor systems (Table 7), with all based upon a single standard.

Table 7. English linear systems and their period of usage.

ENGLISH LINEAR SYSTEMS	PERIOD OF USE
Primary Standard	1305 - 1826
Cloth	?
Wool Cordage	?
Cotton Cordage	?
Linen Cordage	?
Imperial	1826 - 20th C

Of the metrological systems considered within this study, the English Linear System represents the most conservative and stable metrological system yet encountered. Outside of a few terminological variations, this system has remained intact since 1305. It has continually added new metrological units through time, and in 1826 the plethora of units was officially pared to the minimum number in common usage.

ENGLISH OR PRIMARY STANDARD LINEAR SYSTEM (1305 - 1826)

This system was first established by Edward I who defined the *barleycorn*, *inch*, *foot*, *ulna* (*yard*) and *rod*. It was expanded at various times, and finally redefined in 1826 with the adoption of the Imperial Linear System. Base measurement of the *foot* is taken as 30.479449 cm (Doursther 1840: 412). This table was prepared from lengths given in Encyclopaedia... 1798, Good et al. 1813, Doursther 1840: 412 and 466, Skinner 1967 and Zupko 1977: 142.

METRIC																					
2.54	mm	1																			
3.175	mm	1.25	1																		
8.47	mm	3.333...	2.666...	1																	
2.54	cm	10	8	3	1																
7.62	cm	30	24	9	3	1															
10.16	cm	40	32	12	4	1.333...	1														
20.12	cm	79.2	63.36	23.76	7.92	2.64	1.98	1													
22.86	cm	90	72	27	9	3	2.25	1.136...	1												
30.48	cm	120	96	36	12	4	3	1.515...	1.333...	1											
45.72	cm	180	144	54	18	6	4.5	2.272...	2	1.5	1										
91.44	cm	360	288	108	36	12	9	4.545...	4	3	2	1									
1.143	m	450	360	135	45	15	11.25	5.681...	5	3.75	2.5	1.25	1								
1.524	m	600	480	180	60	20	15	7.575...	6.666...	5	3.333...	1.666...	1.333...	1							
1.83	m	720	576	216	72	24	18	9.090...	8	6	4	2	1.6	1.2	1						
5.03	m	1980	1584	594	198	66	49.5	25	22	16.5	11	5.5	4.4	3.2	2.75	1					
6.10	m	2400	1920	720	240	80	60	30.303...	26.666...	20	13.333...	6.666...	5.333...	4	3.333...	1.212...	1				
20.12	m	7920	6336	2376	792	264	198	100	88	66	44	22	17.6	13.2	11	4	3.3	1			
201.16	m	79,200	63,360	23,760	7920	2640	1980	1000	880	660	440	220	176	132	110	40	33	10	1		
219.45	m	86,400	69,120	25,920	8640	2880	2160	1090.909...	960	720	480	240	192	144	120	43.636...	36	10.909...	1.090...	1	
1.61	km	633,600	506,880	190,080	63,360	21,120	15,840	8000	7040	5280	3520	1760	1408	1056	880	320	264	80	8	7.333...	1
4.83	km	1,900,800	1,520,640	570,240	190,080	63,360	47,520	24,000	21,120	15,840	10,560	5280	4224	3168	2640	960	792	240	24	22	3

ENGLISH CLOTH MEASURES (dates unknown)

This system is based upon the English Linear System but its origin and complete definition remain unknown. This table was prepared from measures given in Doursther 1840: 159; Scott 1862: 662 and Zupko 1977: 150.

METRIC

2.54	cm	1	*Inch*					
5.72	cm	2.25	1	*Nail*				
22.86	cm	9	4	1	*Quarter*			
69.85	cm	27.5	12.25	3.055...	1	*Goad*		
91.44	cm	36	16	4	1.309...	1	*Yard*	
1.14	m	45	20	5	1.632...	1.25	1	*Ell*

ENGLISH WOOL CORDAGE MEASURES (dates unknown)

This system was based upon the English Linear System but its origins remain unknown. This table was prepared from measures given in Doursther 1840: 135.

METRIC

91.44	cm	1	*Yard* or *Thread*		
73.15	m	80	1	*Ley*	
512.05	m	560	7	1	*Hank*

ENGLISH COTTON CORDAGE MEASURES (dates unknown)

This system was based upon the English Linear System but its origins remain unknown. This table was prepared from measures given in Doursther 1840: 135.

METRIC						
91.44	cm	1	*Yard*			
1.37	m	1.5	1	*Thread*		
109.73	m	120	80	1	*Ley*	
768.08	m	840	560	7	1	*Hank*

ENGLISH LINEN CORDAGE MEASURES (dates unknown)

This system was based upon the English Linear System but its origins remain unknown. This table was prepared from measures given in Doursther 1840: 135.

METRIC						
91.44	cm	1	*Yard*			
2.29	m	2.5	1	*Thread*		
274.32	m	300	120	1	*Ley*	
3.292	km	3600	1440	12	1	*Hank*

IMPERIAL LINEAR SYSTEM (1826 - 20th century)

This system was defined by act of Parliament in 1824 and was officially adopted on 1 January 1826. It was based upon the English Linear System, but changed *poles* to *rods* (dropping the old *rod* of 5 1/2 *feet*) and added *cable lengths*. This table was prepared from measures given in Doursther 1840 and Zupko 1977: 162.

METRIC												
2.54	cm	1 *Inch*										
20.12	cm	7.92	1 *Gunter's Link*									
30.48	cm	12	1.515...	1 *Foot*								
91.44	cm	36	4.545...	3	1 *Yard*							
1.83	m	72	9.090...	6	2	1 *Fathom*						
5.03	m	198	25	16.5	5.5	2.75	1 *Rod*					
20.12	m	792	100	66	22	11	4	1 *Gunter's Chain*				
182.88	m	7200	909.090...	600	200	100	36.363...	9.090...	1 *Cable length*			
201.16	m	7920	1000	660	220	110	40	10	1.1	1 *Furlong*		
1.61	km	63,360	8000	5280	1760	880	320	80	8.8	8	1 *Mile*	
4.83	km	190,080	24,000	15,840	5280	2640	960	240	26.4	24	3	1 *League*

Superficial System

Only one English superficial system has been identified and it was based entirely upon the English Linear System.

ENGLISH AREA SYSTEM (1305 - present)

This system was based upon the English Linear System and was in use by 1305. This table was prepared from measures given in Doursther 1840, Skinner 1969 and Zupko 1977.

METRIC												
10.080 mm^2	1 *Square Line*											
6.451 cm^2	100	1 *Square Inch*										
4.047 dm^2	6272.639...	62.726...	1 *Square Gunter's Link*									
9.290 dm^2	14,440	144	2.302...	1 *Square Foot*								
83.610 dm^2	129,960	1296	20.718...	9	1 *Square Yard*							
2.322 ca	361,000	3610	57.551...	25	2.777...	1 *Square Pace*						
25.292 ca	3,931,290	39,312.9	626.736...	272.25	30.25	10.89	1 *Square Rod*					
4.047 a	62,900,640	629,006.4	10,027.778...	4356	484	174.24	16	1 *Square Gunter's Chain*				
10.117 a	1.572... x 10^8	1,572,516	25,069.444...	10,890	1210	435.6	40	2.5	1 *Rood*			
40.467 a	6.280... x 10^8	6,290,064	100,277.78...	43,560	4840	1742.4	160	10	4	1 *Acre*		
2.590 km^2	4.025... x 10^{11}	4.025... x 10^9	64,177,778...	27,878,400	3,097,600	111,513.6	102,400	6400	2560	640	1 *Square Mile*	

Volumetric System

Only one English volumetric system was identified and it was based entirely upon the English Linear System.

ENGLISH VOLUME SYSTEM (1305 - present)

This system was based upon the English Linear System. The base measure is the *cubic inch* measuring 16.386163 cc (Doursther 1840:96), which was redefined in 1901 as 16.387162 cc (Judson 1976).

METRIC					
16.386 mc	1 *Cubic Line*				
16.386 cc	1000	1 *Cubic Inch*			
28.315 dc	1,728,000	1728	1 *Cubic Foot*		
7.645 ds	46,656,000	46,656	27	1 *Cubic Yard*	

FRENCH SYSTEMS OF WEIGHTS AND MEASURES

Unlike English systems, French systems were much more provincial in that each city maintained its own separate systems. Many of the larger cities maintained systems which served wider regional needs, and a few systems were adopted by the King to meet those military, academic and bureaucratic needs of the Crown in governing the loose association of French provinces. Two years after the commencement of the French Revolution in 1789, the French National Assembly presented its first official version of a national system of weights and measures. Four years later in 1795, various systems were defined, and after another four years, standards were ratified. However, not until 1840 were the metric systems officially enacted. According to metrological research conducted by Arthur Kennelly (1928), pre-metric weights and measures were still in widespread usage in 1926-27. Earlier provincial metrological units and systems had not been entirely replaced by the Metric System, and older units and systems were preferred by many tradesmen engaged in traditional occupations. From this observation it is inferred that metrological systems are not replaced immediately with the introduction of new systems, rather, both old and new systems function simultaneously for an indeterminate period of time probably exceeding a single generation.

Dry Weight Systems

Of the six French dry weight systems included within this study, five can be regarded as major systems, with the one remaining system being based upon one of the five major systems (Table 8).

Table 8. French dry weight systems, their known period of usage, and their standard *livre* weights.

FRENCH DRY WEIGHT SYSTEMS	PERIOD OF USE	LIVRE (g)
Marc de Troyes	1350 - 1840	489.41
Pharmaceutique	? - post-1791	367.14
Premier Métrique Pharmaceutique	post-1791 - 1840	512.00
Métrique	1840 - 20th C	-
Métrique Pharmaceutique	1840 - ?	500.00

Three of these major systems were used exclusively for weighing medicines, while the Système de poids de Marc de Troyes and Système métrique de poids were used for all other commodities.

SYSTEME DE POIDS DE MARC DE TROYES (1350 - 1840)

The *marc* defined by King John of France (1350 - 1364) was 1/50 of the *pile* of Charlemagne, and in 1350 the Système de poids de Marc de Troyes was defined with a set of standards based on Charlemagne's standards. This system was replaced by the Système métrique de poids in 1840. This table was prepared from weights given in Encyclopaedia... 1798, Doursther 1840 and Skinner 1967.

METRIC															
0.0022126	g	1													
0.0531042	g	24	1												
0.21242	g	96	4	1											
0.63725	g	288	12	3	1										
1.1245	g	576	24	6	2	1									
3.8235	g	1728	72	18	6	3	1								
30.588	g	13,824	576	144	48	24	8	1							
61.18	g	27,648	1152	288	96	48	16	2	1						
122.35	g	55,296	2304	576	192	96	32	4	2	1					
244.70	g	110,592	4608	1152	384	192	64	8	4	2	1				
489.41	g	221,184	9216	2304	768	384	128	16	8	4	2	1			
12.2352	kg	5,529,600	230,400	57,600	19,200	9600	3200	400	200	100	50	25	1		
48.941	kg	22,118,400	921,600	230,400	76,800	38,400	12,800	1600	800	400	200	100	4	1	
146.82	kg	66,355,200	2,764,800	691,200	230,400	115,200	38,400	4800	2400	1200	600	300	12	3	1
489.41	kg	2.211... x 10^8	9,216,000	2,304,000	768,000	384,000	128,000	16,000	8000	4000	2000	1000	40	10	3.333...

SYSTEME DE POIDS D'EASTERLIN (1350 - 1840)

This system was based upon the Système de poids de Marc de Troyes established by King John of France. It was used to weigh precious metals and was replaced by the Système métrique de poids. This table was prepared from weights given in Doursther 1840: 235-236 and Skinner 1967.

METRIC							
0.3823 g	1 *Felin*						
0.7647 g	2	1 *Maille*					
1.5294 g	4	2	1 *Esterlin*				
30.588 g	80	40	20	1 *Once*			
244.70 g	640	320	160	8	1 *Marc*		
489.41 g	1280	640	320	16	2	1 *Livre*	

SYSTEME DE POIDS PHARMACEUTIQUE (? - post-1791)

This system was used for pharmaceuticals and was reported by Doursther 1840: 235, but its origins remain unknown.

METRIC							
0.06374 g	1 *Grain*						
0.637 g	10	1 *Obole*					
1.275 g	20	2	1 *Scruple*				
3.824 g	60	6	3	1 *Gros*			
30.595 g	480	48	24	8	1 *Once*		
367.142 g	5760	576	288	96	12	1 *Pharmaceutique Livre*	

PREMIER SYSTEME METRIQUE DE POIDS PHARMACEUTIQUE (post-1791 - 1840)

This system was used for pharmaceuticals and replaced the older Système de poids pharmaceutique sometime after 1791 when the French National Assembly announced the Système métrique de poids. It was brought into use during the initial years of the French Revolution and was eventually replaced by a revised Système métrique de poids pharmaceutique enacted by law in 1837, and was prohibited from use after 1840. This table was prepared from weights given in Doursther 1840: 235.

METRIC								
1.0 g	1 *Quart de la Drachme Vulgaire*							
4.0 g	4	1 *Drachme Vulgaire*						
16.0 g	16	4	1 *Demi-Once*					
32.0 g	32	8	2	1 *Once*				
128.0 g	128	32	8	4	1 *Quarteron*			
256.0 g	256	64	16	8	2	1 *Demi-Livre*		
512.0 g	512	128	32	16	4	2	1 *Livre*	

SYSTEME METRIQUE DE POIDS (1840 - present)

This system was first officially presented by the French National Assembly in 1791. It was defined in 1795, and standards were ratified in 1799. However, older weight systems were not officially abolished until 1837 when a law was passed which levied a fine on anyone using these older systems after 1840. Even with legislation, older weight systems were still being used in France well into the 20th century. In 1799 the *kilogram* standard was established as the weight of a *decistere* (1000 cc) of water at normal atmospheric pressure at 4° C (Klein 1974: 199-200), and one *gram* of water equalled one *cubic centimeter* or one *milliliter*. This table was prepared from weights given in Dourstther 1840.

METRIC

0.001	g	1 *Milligram (mg)*								
0.01	g	10	1 *Centigram (cg)*							
0.1	g	100	10	1 *Decigram (dg)*						
1.0	g	1000	100	10	1 *Gram (g)*					
10.0	g	10,000	1000	100	10	1 *Decagram (dkg)*				
100.0	g	100,000	10,000	1000	100	10	1 *Hectogram (hg)*			
1000.0	g	1,000,000	100,000	10,000	1000	100	10	1 *Kilogram (kg)*		
10.0	kg	10,000,000	1,000,000	100,000	10,000	1000	100	10	1 *Myriagram (mg)*	
100.0	kg	1×10^8	10,000,000	1,000,000	100,000	10,000	1000	100	10	1 *Quintal (q)*
1000.0	kg	1×10^9	1×10^8	10,000,000	1,000,000	100,000	10,000	1000	100	10	1 *Metric Ton (mt)*

SYSTEME METRIQUE DE POIDS PHARMACEUTIQUE (1840 - ?)

This system was used for pharmaceuticals and replaced the earlier Premier système métrique de poids pharmaceutique. It was enacted by law in 1837 to be officially adopted in 1840. This table was prepared from weights given in Doursther 1840: 235-236.

METRIC																
0.025	g	1 *Demi-Grain*														
0.05	g	2	1 *Grain*													
0.1	g	4	2	1 *Double Grain*												
2.0	g	80	40	20	1 *Demi-Gros*											
4.0	g	160	80	40	2	1 *Gros*										
8.0	g	320	160	80	4	2	1 *2 Gros*									
12.0	g	480	240	120	6	3	1.5	1 *3 Gros*								
16.0	g	640	320	160	8	4	2	1.333...	1 *4 Gros*							
32.0	g	1280	640	320	16	8	4	2.666...	2	1 *Once*						
64.0	g	2560	1280	640	32	16	8	5.333...	4	2	1 *2 Onces*					
96.0	g	3840	1920	960	48	24	12	8	6	3	1.5	1 *3 Onces*				
125.0	g	5120	2560	1280	64	32	16	10.666...	8	4	2	1.333...	1 *Quateron*			
250.0	g	10,240	5120	2560	128	64	32	21.333...	16	8	4	2.666...	2	1 *Demi-Livre*		
500.0	g	20,480	10,240	5120	256	128	64	42.666...	32	16	8	5.333...	4	2	1 *Livre*	
1000.0	g	40,960	20,480	10,240	512	256	128	85.333...	64	32	16	10.666...	8	4	2	1 *Double Livre*

Liquid Weight Systems

No examples of French liquid weight systems were encountered.

Dry Capacity Systems

As mentioned at the beginning of this discussion of French weights and measures, every city utilized its own units and systems. For dry capacity the plethora of units and systems has yet to be fully comprehended. It would appear that every city had dry capacity units to be used for agricultural grain crops, and some cities appear to have used separate systems for wheat and oats. Paris had one system for grain and lime, and separate systems for oats, coal, charcoal and salt. Of the 40 or so city systems reported by Horace Doursther (1840), only a dozen of the major commercial city systems are reproduced in this study. General knowledge of these systems is sparce, and a lifetime would have to be devoted to the study of French city metrological systems before one could fully comprehend the multitude of dry capacity systems in use during the 15th - 19th centuries. Such a task is obviously beyond the scope of this study.

Suffice to note that pre-19th-century French dry capacity measures were exceedingly complex and communally derived. Metrological units were often identified by identical terms in each of the major cities, but their capacities varied tremendously. Standards were maintained by city governments and merchants' guilds, and in many cities the regulation of weights and measures was quite strict. However, inter-city commerce was often conducted with inaccurate measures, and the size variability of any given unit was great. Not until the Système de capacité du Boisseau usuel pour les matières sèches was established in 1812 was a nationwide system available, and it was quickly replaced by the Système métrique de capacité pour les matières sèches et les liquides in 1840.

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE BORDEAUX (? - 1840)

This system was used in Bordeaux, and this table was prepared from capacities given in Doursther 1840.

METRIC				
78.04	1	1		*Boisseau*
1560.80	1	20	1	*Tonneau*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE LA ROCHELLE (? - 1840)

This system was used in La Rochelle, and this table was prepared from capacities given in Doursther 1840.

METRIC				
33.80	1	1		*Boisseau*
1419.60	1	42	1	*Tonneau*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE LA ROCHELLE EMPLOYE POUR LE SEL (? - 1840)

This system was used for the commerce of salt in La Rochelle, and this table was prepared from capacities given in Doursther 1840.

METRIC					
50.00	1	1	*Boisseau* or *Demi-hectolitre*		
100.00	1	2	1	*Mine*	
1200.00	1	24	12	1	*Muid*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE LYON EMPLOYE POUR LES GRAINS (? - 1840)

This system was used for the commerce of grain in Lyon, and this table was prepared from capacities given in Doursther 1840.

METRIC						
2.00	1	1	*Picotin*			
7.99	1	4	1	*Coupe*		
31.97	1	16	4	1	*Bichet*	
191.82	1	64	24	6	1	*Année*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE MARSEILLE EMPLOYE POUR LE BLE (? - 1840)

This system was used for the commerce of wheat in Marseille, and this table was prepared from capacities given in Doursther 1840.

METRIC						
2.50	1	1	*Picotin*			
5.00	1	2	1	*Civadier*		
20.00	1	8	4	1	*Panau*	
40.00	1	16	8	2	1	*Emine*
160.00	1	64	32	8	4	1 *Charge*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE PARIS EMPLOYE POUR LES GRAINS ET LA CHAUX (? - 1840)

This system was used for the commerce of grain and lime in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC									
50.81	ml	1	*Mesurette*						
813.02	ml	16	1	*Litron*					
3.25	1	64	4	1	*Picotin* or *Quarte*				
13.01	1	256	16	4	1	*Boisseau*			
39.03	1	768	48	12	3	1	*Minot*		
78.05	1	1536	96	24	6	2	1	*Mine*	
156.10	1	3072	192	48	12	4	2	1	*Setier*
1873.20	1	36,864	2304	576	144	48	24	12	1 *Muid*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE PARIS EMPLOYE POUR L'AVOINE (? - 1840)

This system was used for the commerce of oats in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC

50.81	ml	1	*Mesurette*							
813.02	ml	16	1	*Litron*						
3.25	l	64	4	1	*Picotin*					
13.01	l	256	16	4	1	*Boisseau*				
78.05	l	1536	96	24	6	1	*Minot*			
156.10	l	3072	192	48	12	2	1	*Mine*		
312.20	l	6144	384	96	24	4	2	1	*Setier*	
3746.39	l	73,728	4608	1152	288	48	24	12	1	*Muid*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE PARIS EMPLOYE POUR LE CHARBON (? - 1840)

This system was used for the commerce of coal in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC

11.38	l	1	*Quarte*			
45.53	l	4	1	*Boisseau*		
136.60	l	12	3	1	*Demi-Minot*	
273.20	l	24	6	2	1	*Minot*
4098.00	l	360	90	30	15	1 *Voie*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE PARIS EMPLOYE POUR LE CHARBON DE BOIS (? - 1840)

This system was used for the commerce of charcoal in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC										
50.81	ml	1 *Mesurette*								
813.02	ml	16	1 *Litron*							
3.25	l	64	4	1 *Picotin* or *Quarte*						
13.01	l	256	16	4	1 *Boisseau*					
104.07	l	2048	128	32	8	1 *Minot*				
208.13	l	4096	256	64	16	2	1 *Mine* or *Charge*			
416.27	l	8192	512	128	32	4	2	1 *Setier*		
4162.66	l	81,920	5120	1280	320	40	20	10	1 *Muid*	

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE PARIS EMPLOYE POUR LE SEL (? - 1840)

This system was used for the commerce of salt in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC										
50.81	ml	1 *Mesurette*								
813.02	ml	16	1 *Litron*							
3.25	l	64	4	1 *Picotin* or *Quarte*						
13.01	l	256	16	4	1 *Boisseau*					
52.03	l	1024	64	16	4	1 *Minot*				
104.07	l	2048	128	32	8	2	1 *Mine*			
208.13	l	4096	256	64	16	4	2	1 *Setier*		
2497.59	l	49,152	3072	768	192	48	24	12	1 *Muid*	

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE ROUEN EMPLOYE POUR LE BLE (? - 1840)

This system was used for the commerce of wheat in Rouen, and this table was prepared from capacities given in Doursther 1840.

METRIC						
22.75	1	1	*Boisseau*			
91.00	1	4	1	*Mine*		
182.00	1	8	2	1	*Setier*	
2184.00	1	96	24	12	1	*Muid*

SYSTEME DE CAPACITE POUR LES MATIERES SECHES DE ROUEN EMPLOYE POUR LE CHARBON (? - 1840)

This system was used for the commerce of coal in Rouen, and this table was prepared from capacities given in Doursther 1840.

METRIC					
13.00	1	1	*Boisseau*		
39.00	1	3	1	*Demi-minot*	
117.00	1	9	3	1	*Baril*

SYSTEME DE CAPACITE DU BOISSEAU USUEL POUR LES MATIERES SECHES (1812 - 1840)

This system was established by Napoleon in 1812 as a compromise between existing regional and metric terminology. It was abolished by law in 1837 and was prohibited from use after 1840. This table was prepared from capacities given in Doursther 1840.

METRIC					
3.13	1				1 *Quarte*
6.25	1	2			1 *Demi-Boisseau*
12.50	1	4	2		1 *Boisseau Usuel*
100.0	1	32	16	8	1 *Hectolitre*

SYSTEME METRIQUE DE CAPACITE POUR LES MATIERES SECHES ET LES LIQUIDES (1840 - present)

This system was defined by law in 1837 and was officially adopted in 1840. This table was prepared from capacities given in Doursther 1840.

METRIC									
1.0	ml	1 *Millilitre (ml)*							
10.0	ml	10	1 *Centilitre (cl)*						
100.0	ml	100	10	1 *Décilitre (dl)*					
125.0	ml	125	12.5	1.25	1 *Huitime*				
1000.0	ml	1000	100	10	8	1 *Litre (l)*			
10.0	l	10,000	1000	100	80	10	1 *Décalitre (dkl)*		
100.0	l	100,000	10,000	1000	800	100	10	1 *Hectolitre (hl)*	
1000.0	l	1,000,000	100,000	10,000	8000	1000	100	10	1 *Kilolitre (kl)*

Liquid Capacity Systems

As with French dry capacity systems, liquid capacity systems were exceedingly numerous, with many cities having separate measures for wine, eau de vie, oil, etc. Only a sample of these diverse systems is presented for a few of the major commercial centers. With the development of the Système métrique de capacité pour les matières sèches et les liquides, a single system for both dry and liquid capacities was established throughout France.

SYSTEME DE CAPACITE POUR LES LIQUIDES DE BORDEAUX (? - 1840)

This system was used in Bordeaux, and this table was prepared from capacities given in Doursther 1840.

METRIC

7.54	1	1	*Velte*				
113.10	1	15	1	*Feuillette* or *Demi-Barrique*			
150.80	1	20	1.333...	1	*Tiercon*		
226.20	1	30	2	1.5	1	*Barrique Vin*	
377.00	1	50	3.333...	2.5	1.666...	1	*Pipe*
904.80	1	120	8	6	4	2.4	1 *Tonneau*

SYSTEME DE CAPACITE POUR LES LIQUIDES DE LYON (? - 1840)

This system was used in Lyon, and this table was prepared from capacities given in Doursther 1840.

METRIC

931.36	ml	1	*Pot*	
81.96	1	88	1	*Ânée de vin*

SYSTEME DE CAPACITE POUR LE VIN DE MARSEILLE ET DE TOULON (? - 1840)

This system was used for the commerce of wine in Marseille and Toulon, and this table was prepared from capacities given in Doursther 1840.

METRIC					
266.78 ml	1	*Quart*			
1.07 l	4	1	*Pot*		
16.00 l	60	15	1	*Escandal*	
64.01 l	240	60	4	1	*Millerolle*

SYSTEME DE CAPACITE POUR L'HUILE DE MARSEILLE ET DE TOULON (? - 1840)

This system was used for the commerce of oil in Marseille and Toulon, and this table was prepared from capacities given in Doursther 1840.

METRIC							
400.05 ml	1	*Quarteron*					
444.50 ml	1.111...	1	*Livre de Poid*				
1.33 l	3.333...	3	1	*Livre de Jauge*			
16.00 l	40	36	12	1	*Escandal*		
64.01 l	160	144	48	4	1	*Millerolle*	
896.11 l	2240	2016	672	56	14	1	*Tonneau*

SYSTEME DE CAPACITE POUR LES LIQUIDES DE PARIS (? - 1840)

This system was used in Paris, and this table was prepared from capacities given in Doursther 1840.

METRIC

29.10	ml	1	*Roquille*										
58.21	ml	2	1	*Demi-Posson*									
116.42	ml	4	2	1	*Posson*								
232.83	ml	8	4	2	1	*Demi-Setier*							
465.66	ml	16	8	4	2	1	*Chopine*						
931.32	ml	32	16	8	4	2	1	*Pinte*					
1.86	l	64	32	16	8	4	2	1	*Quart* or *Pot*				
7.45	l	256	128	64	32	16	8	4	1	*Velte* or *Setier*			
67.05	l	2304	1152	576	288	144	72	36	9	1	*Quartaut*		
89.41	l	3072	1536	768	384	192	96	48	12	1.333...	1	*Tiergon*	
134.11	l	4608	2304	1152	576	288	144	72	18	2	1.5	1	*Feuillette*
201.16	l	6912	3456	1728	864	432	216	108	27	3	2.25	1.5	1 *Poingon*
268.22	l	9216	4608	2304	1152	576	288	144	36	4	3	2	1.333... 1 *Muid*

SYSTEME DE CAPACITE POUR LES LIQUIDES DE ROUEN (? - 1840)

This system was used in Rouen, and this table was prepared from capacities given in Doursther 1840.

METRIC

1.65	l	1	*Pot*
197.57	l	120	1 *Barrique*

SYSTEME METRIQUE DE CAPACITE POUR LES LIQUIDES (see SYSTEME METRIQUE DE CAPACITE POUR LES MATIERES SECHES ET LES LIQUIDES)

Linear Systems

Of the eight French linear systems included within this study, four can be regarded as major national systems, two were used for cloth measurement and were based upon one of the national systems, and two were city systems used for land and construction measurements (Table 9).

Table 9. French linear systems and their period of usage.

FRENCH LINEAR SYSTEMS	PERIOD OF USE
Ancien pied du roi	ca. 8th C - 1668
Pied du roi	1668 - 1840
Pied de St-Hubert de Liège	? - 1840
Pied de St-Lambert de Liège	? - 1840
Pied usuel	1812 - 1840
Métrique	1840 - 20th C

The Systèmes de longueur du pied du roi were originally based upon the *aune* standard used for cloth measurement, but in 1668 the standard became a newly defined *toise*. The reasons for the use and survival of the Liège linear systems is not known, but their existence does indicate that regional and city measures were preferred over the royal systems by some of the trades.

ANCIEN SYSTEME DE LONGUEUR DU PIED DU ROI (ca. 8th century - 1668)

Half of the *Hashimi cubit* of 25.56 *inches* (64.9 cm) became the *Frankish pied* of Charlemagne, 771 - 814 (Skinner 1967: 88-89). As defined, this system was based upon the *aune* standard of 1554 established by François I (Machabey 1969). In 1668 a new *toise* standard was created which measured 11 mm shorter than the earlier *toise* standard (the original *aune* standard was retained after 1668, but all other measures were subsequently made in relation to the new *toise* standard, see Système de longueur du pied du roi). This table was prepared from measures given in Doursther 1840 and Machabey 1969.

METRIC												
0.189	mm	1 *Point*										
2.268	mm	12	1 *Ligne*									
2.722	cm	144	12	1 *Pouce*								
32.659	cm	1728	144	12	1 *Pied du Roi*							
81.648	cm	4320	360	30	2.5	1 *Pas Ordinaire*						
1.188446	m	6288	524	43.666...	3.638...	1.455...	1 *Aune (3 pieds, 7 pouces, 8 lignes)*					
1.633	m	8640	720	60	5	2	1.374...	1 *Brasse* or *Pas Geometrique*				
1.960	m	10,368	864	72	6	2.4	1.648...	1.2	1 *Toise*			
5.879	m	31,104	2592	216	18	7.2	4.946...	3.6	3	1 *Perche*		
1.960	km	10,368,000	864,000	72,000	6000	2400	1648.855	1200	1000	333.333...	1 *Mille Itinéraire*	
3.919	km	20,736,000	1,728,000	144,000	12,000	4800	3297.709...	2400	2000	666.666...	2	1 *Lieue*

SYSTEME DE LONGUEUR DU PIED DU ROI (1668 - 1840)

This system was based upon the Ancien système de longueur du pied du roi, but its measures were based upon the new *toise* standard of 1668, except for the *aune* which remained unchanged. This table was based upon measures given in Doursther 1840, Skinner 1967 and Machabey 1969.

METRIC												
0.188	mm	1 *Point*										
2.256	mm	12	1 *Ligne*									
2.707	cm	144	12	1 *Pouce*								
32.484	cm	1728	144	12	1 *Pied du Roi*							
81.210	cm	4320	360	30	2.5	1 *Pas Ordinaire*						
1.188446	m	6322	526.833...	43.902...	3.658...	1.463...	1 *Aune (3 pieds, 7 pouces, 10 $^{5}/_{6}$ lignes)*					
1.624	m	8640	720	60	5	2	1.366...	1 *Brasse* or *Pas Geometrique*				
1.949	m	10,368	864	72	6	2.4	1.639...	1.2	1 *Toise*			
5.847	m	31,104	2592	216	18	7.2	4.919...	3.6	3	1 *Perche*		
1.949	km	10,368,000	864,000	72,000	6000	2400	1639.987...	1200	1000	333.333...	1 *Mille Itinéraire*	
3.898	km	20,736,000	1,728,000	144,000	12,000	4800	3279.974...	2400	2000	666.666...	2	1 *Lieue de Poste*

MESURES DES CORDAGES EN LAINE (1668 - 1840)

This system was used for the commerce of wool cordage, and this table was prepared from measures given in Doursther 1840: 136.

METRIC						
32.484	cm	1	*Pied*			
1.54	m	4.75	1	*Fil*		
67.89	m	209	44	1	*Echevette*	
1.49	km	4598	968	22	1	*Echeveau*

MESURES DES CORDAGES EN LIN (? - 1840)

This system was used for the commerce of linen cordage and this table was prepared from measures given in Doursther 1840: 136.

METRIC					
1.19	m	1	*Fil* or *Aune*		
19.02	m	16	1	*Echeveau*	
237.69	m	200	12.5	1	*Portée*

SYSTEME DE LONGUEUR DU PIED DE ST-HUBERT DE LIEGE (? - 1840)

This system was used by carpenters and masons in Liège. This table was prepared from measures given in Doursther 1840: 411 and 526.

METRIC

0.295	mm	1	*Point*				
2.95	mm	10	1	*Ligne*			
2.95	cm	100	10	1	*Pouce*		
29.47	cm	1000	100	10	1	*Pied de St. Hubert*	
1.77	m	6000	600	60	6	1	*Toise*
4.86	m	16,500	1650	165	16.5	2.75	1 *Petite Verge*

SYSTEME DE LONGUEUR DU PIED DE ST-LAMBERT DE LIEGE (? - 1840)

This system was used to measure land in Liège. This table was prepared from measures given in Doursther 1840.

METRIC

0.292	mm	1	*Point*			
2.918	mm	10	1	*Ligne*		
2.918	cm	100	10	1	*Pouce*	
29.18	cm	1000	100	10	1	*Pied de St. Lambert*
4.67	m	16,000	1600	160	16	1 *Petite Verge*

SYSTEME METRIQUE DE LONGUEUR OU DU PIED USUEL (1812 - 1840)

This system was established by Napoleon in 1812 as a compromise between the Système de longueur du pied du roi and the Système métrique de longueur. In this system a *pied usuel* equalled 1/3 *meter*. It was abolished by law in 1837 and was prohibited from use after 1840. This table was prepared from measures given in Doursther 1840.

METRIC

2.315	mm	1	*Ligne*					
2.778	cm	12		1	*Pouce*			
33.333	cm	144		12		1	*Pied Usuel*	
1.2	m	518.4		43.2		3.6	1	*Aune Usuelle*
2.0	m	864		72		6	1.666...	1 *Toise Usuelle*

SYSTEME METRIQUE DE LONGUEUR (1840 - present)

This system was first officially presented by the French National Assembly in 1791. The system was defined in 1795, and standards were ratified in 1799. The standard *meter* in 1795 was defined as the ten-millionth part of the arc of meridian from Pole to Equator (Klein 1974: 123). The earlier Système de longueur du pied du roi and the Système métrique de longueur ou du pied usuel were abolished by law in 1837 and the Système métrique de longueur was put into use in 1840. This table was prepared from measures given in Doursther 1840.

METRIC

1.0	mm	1	*Millimeter (mm)*						
10.0	mm	10	1	*Centimeter (cm)*					
100.0	mm	100	10	1	*Decimeter (dm)*				
1000.0	mm	1000	100	10	1	*Meter (m)*			
10.0	m	10,000	1000	100	10	1	*Decameter (dkm)*		
100.0	m	100,000	10,000	1000	100	10	1	*Hectometer (hm)*	
1000.0	m	1,000,000	100,000	10,000	1000	100	10	1	*Kilometer (km)*
10.0	km	10,000,000	1,000,000	100,000	10,000	1000	100	10	1 *Myriameter (mym)*

Superficial Systems

Six French superficial systems have been identified, including four major national systems and two city systems (Table 10).

Table 10. French superficial systems and their period of usage.

FRENCH SUPERFICIAL SYSTEMS	PERIOD OF USE
Ancien pied du roi	ca. 8th C - 1668
Pied du roi	1668 - 1840
Pied de St-Lambert de Liège	? - 1840
Bois de Liège	? - 1840
Pied usuel	1812 - 1840
Métrique	1840 - 20th C

All systems except one were based upon historically identified linear systems. The single exception was the Système de surface de Liège pour le bois for which no comparable linear system has been located.

ANCIEN SYSTEME DE SURFACE DU PIED DU ROI (ca. 8th century - 1668)

This system is postulated as the square measures of the Ancien système de longueur du pied du roi, following terminology for the Système de surface du pied du roi.

METRIC										
0.036	mm^2	1 *Point Carrée*								
5.144	mm^2	144	1 *Ligne Carrée*							
7.407	cm^2	20,736	144	1 *Pouce Carrée*						
10.666	dm^2	2,985,984	20,736	144	1 *Pied Carrée*					
3.840	ca	1.075... x 10^8	746,496	5184	36	1 *Toise Carrée*				
34.559	ca	9.675... x 10^8	6,718,464	46,656	324	9	1 *Perche Carrée*			
34.559	a	9.675... x 10^{10}	6.718... x 10^8	4,665,600	32,400	900	100	1 *Arpent*		
3.840	km^2	1.075... x 10^{14}	7.465... x 10^{11}	5.184 x 10^9	36,000,000	1,000,000	111,111.111...	1111.111...	1 *Mille Carrée*	
15.360	km^2	4.300... x 10^{14}	2.986... x 10^{12}	2.0736 x 10^{10}	1.44 x 10^8	4,000,000	444,444.444...	4444.444...	4	1 *Lieue Carrée*

SYSTEME DE SURFACE DU PIED DU ROI (1668 - 1840)

This system was based upon the Système de longueur du pied du roi and was replaced by the Système métrique de surface. This table was based upon measures given in Doursther 1840.

METRIC										
0.035	mm^2	1 *Point Carrée*								
5.089	mm^2	144	1 *Ligne Carrée*							
7.328	cm^2	20,736	144	1 *Pouce Carrée*						
10.552	dm^2	2,985,984	20,736	144	1 *Pied Carrée*					
3.799	ca	1.075... x 10^8	746,496	5184	36	1 *Toise Carrée*				
34.189	ca	9.675... x 10^8	6,718,464	46,656	324	9	1 *Perche Carrée*			
34.189	a	9.675... x 10^{10}	6.718... x 10^8	4,665,600	32,400	900	100	1 *Arpent*		
3.799	km^2	1.075... x 10^{14}	7.465... x 10^{11}	5.184 x 10^9	36,000,000	1,000,000	111,111.111...	1111.111...	1 *Mille Carrée*	
15.195	km^2	4.300... x 10^{14}	2.986... x 10^{12}	2.0736 x 10^{10}	1.44 x 10^8	4,000,000	444,444.444...	4444.444...	4	1 *Lieue de Post Carrée*

SYSTEME DE SURFACE DU PIED DE ST-LAMBERT DE LIEGE (? - 1840)

This system was based upon the Système de longueur du pied de St-Lambert de Liège and was used for measuring land in Liège. This table was prepared from measures given in Doursther 1840: 68 and 421.

METRIC

8.515	cm^2	1 *Pouce Carrée*					
8.515	dm^2	100	1 *Pied de St. Lambert Carrée*				
21.798	ca	25,600	256	1 *Petite Verge Carrée*			
4.360	a	512,000	5120	20	1 *Grande Verge*		
21.798	a	2,560,000	25,600	100	5	1 *Journau*	
87.191	a	10,240,000	102,400	400	20	4	1 *Bonnier*

SYSTEME DE SURFACE DE LIEGE POUR LE BOIS(? - 1840)

This system was apparently used to measure timber in Liège, but was not based upon the Système de longueur du pied de St-Hubert de Liège. This table was prepared from measures given in Doursther 1840: 68.

METRIC

23.652	ca	1 *Petite Verge Carrée*			
4.730	a	20	1 *Grande Verge*		
23.652	a	100	5	1 *Journau*	
94.608	a	400	20	4	1 *Bonnier*

SYSTEME DE SURFACE DU PIED USUEL (1812 - 1840)

This system was based upon the Système métrique de longueur ou du pied usuel established by Napoleon in 1812. This table was prepared from measures given in Doursther 1840.

METRIC

5.358	mm^2	1 *Ligne Carrée*			
7.716	cm^2	144	1 *Pouce Carrée*		
11.111	dm^2	20,736	144	1 *Pied Usuel Carrée*	
4.0	ca	746,496	5184	36	1 *Toise Usuelle Carrée*

SYSTEME METRIQUE DE SURFACE (1840 - present)

This system is based upon the Système métrique de longueur, and this table was prepared from measures given in Doursther 1840.

METRIC

1.0	mm^2	1 *Square Millimeter (mm^2)*						
100.0	mm^2	100	1 *Square Centimeter (cm^2)*					
100.0	cm^2	10,000	100	1 *Square Decimeter (dm^2)*				
100.0	dm^2	1,000,000	10,000	100	1 *Centiare (ca)*			
100.0	ca	1×10^8	1,000,000	10,000	100	1 *Are (a)*		
100.0	a	1×10^{10}	1×10^8	1,000,000	10,000	100	1 *Hectare (ha)*	
100.0	ha	1×10^{12}	1×10^{10}	1×10^8	1,000,000	10,000	100	1 *Square Kilometer (km^2)*
100.0	km^2	1×10^{14}	1×10^{12}	1×10^{10}	1×10^8	1,000,000	10,000	100	1 *Square Myriameter (mym^2)*

Volumetric Systems

Four French volumetric systems have been identified and all were based upon related linear systems.

ANCIEN SYSTEME DES VOLUMES DU PIED DU ROI (ca. 8th century - 1668)

This system was based upon the Ancien système de longueur du pied du roi and follows terminology from the Système de longueur du pied du roi.

METRIC						
0.00675	mc	1 *Point Cube*				
11.666	mc	1728	1 *Ligne Cube*			
20.168	cc	2,985,984	1728	1 *Pouce Cube*		
34.834	dc	$5.160... \times 10^{9}$	2,985,984	1728	1 *Pied Cube*	
7.530	s	$1.115... \times 10^{12}$	$6.450... \times 10^{8}$	373,248	216	1 *Toise Cube*

SYSTEME DES VOLUMES DU PIED DU ROI (1668 - 1840)

This system was based upon the Système de longueur du pied du roi, and this table was prepared from measures given in Doursther 1840.

METRIC						
0.00664	mc	1 *Point Cube*				
11.479	mc	1728	1 *Ligne Cube*			
19.836	cc	2,985,984	1728	1 *Pouce Cube*		
34.277	dc	$5.160... \times 10^{9}$	2,985,984	1728	1 *Pied Cube*	
7.404	s	$1.115... \times 10^{12}$	$6.450... \times 10^{8}$	373,248	216	1 *Toise Cube*

SYSTEME METRIQUE DES VOLUMES OU SYSTEME DES VOLUMES DU PIED USUEL (1812 - 1840)

This system was based upon the Système métrique de longueur ou pied usuel established by Napoleon in 1812. This table was prepared from measures given in Doursther 1840.

METRIC

12.404	mc	1 *Ligne Cube*							
21.433	cc	1728	1 *Pouce Cube*						
37.037	dc	2,985,984	1728	1 *Pied Usuel Cube*					
8.0	s	$6.450... \times 10^{8}$	373,248	216	1 *Toise Cube*				

SYSTEME METRIQUE DES VOLUMES (1840 - present)

This system was based upon the Système métrique de longueur. In 1795 the *stere* was defined as one *cubic meter*, and later in 1799, one *cubic centimeter* of water at normal atmospheric pressure at 4° C was defined as equal to one *milliliter* or one *gram*. This table was prepared from measures given in Doursther 1840.

METRIC

1.0	mc	1 *Cubic Millimeter (mc)*										
1000.0	mc	1000	1 *Cubic Centimeter (cc)*									
1000.0	cc	1,000,000	1000	1 *Cubic Decimeter (dc)*								
100.0	dc	1×10^{8}	100,000	100	1 *Decistere (ds)*							
10.0	ds	1×10^{9}	1,000,000	1000	10	1 *Stere (s)*						
50.0	ds	5×10^{9}	5,000,000	5000	50	5	1 *Double Stere*					
100.0	ds	1×10^{10}	10,000,000	10,000	100	10	2	1 *Decastere (dks)*				

AMERICAN SYSTEMS OF WEIGHTS AND MEASURES

When Europeans emigrated to North America, they packed up their material culture and brought along traditional societal values. Included within their cultural baggage were contemporary and anachronistic metrological units and systems. These metrological values became regionalized and codified by each of the colonies, until a few were eventually sorted out and codified as national systems. These resultant national systems were originally derived from English systems, albeit with a few deletions. No attempt has been made to identify the various communal and colonial systems which may have existed prior to the Revolutionary War. Rather, only those systems that eventually emerged as national systems have been reported.

Dry Weight Systems

Three American dry weight systems have been identified, including two major systems and a single remaining system based upon one of the major systems.

AMERICAN TROY POUND WEIGHT SYSTEM (1497 - present)

This is the same system used in England. It was officially adopted in 1828 from an "exact" copy of the 1758 English standard which purportedly weighed 373.202021511 g (Doursther 1840: 214 and Judson 1976). After 1844 the *Troy pound* would have been 373.242 g in relationship to the *Avoirdupois pound* measured at that time.

AMERICAN APOTHECARY WEIGHT SYSTEM (post-1497 - 20th century)

This is the same system used in England and identified as the Apothecary Weight System.

AMERICAN AVOIRDUPOIS POUND WEIGHT SYSTEM (1582 - present)

This is basically the same system used in England without the *scruple* and *stone*. It was officially adopted in 1832 as 7000/5760 *Troy pounds*. The actual weight is unknown, but 7000/5760 of the 1758 English Troy standard would have been 453.544 g. However, the English *Avoirdupois pound* standard measured in 1844 was 453.59265 g, while the American *Avoirdupois pound* after 1893 was 453.5924277 g and after 1959 was 453.59237 g. This table was prepared from weights given in Doursther 1840 and Judson 1976.

METRIC										
0.0648	g	1 *Troy Grain*								
1.772	g	27.34375	1 *Dram*							
28.350	g	437.5	16	1 *Avoirdupois Ounce*						
453.592	g	7000	256	16	1 *Avoirdupois Pound*					
12.70	kg	196,000	7168	448	28	1 *Quarter*				
45.36	kg	700,000	25,600	1600	100	3.571...	1 *Short Hundredweight*			
50.80	kg	784,000	28,672	1792	112	4	1.12	1 *Hundredweight*		
907.18	kg	14,000,000	512,000	32,000	2000	71.428...	20	17.857...	1 *Short Ton*	
1.016	mt	15,680,000	573,440	35,840	2240	80	22.4	20	1.12	1 *Long Ton*

Liquid Weight Systems

No examples of American liquid weight systems were encountered.

Dry Capacity System

AMERICAN DRY CAPACITY SYSTEM (1702 - present)

This system is based upon the English system identified as the William III Winchester Corn Capacity System and was based upon the *bushel* measuring 2150.42 *cubic inches*. This table was prepared from measures given in Doursther 1840, Skinner 1967 and Judson 1976.

METRIC					
550.58	ml	1 *Pint*			
1101.16	ml	2	1 *Quart*		
8.809	l	16	8	1 *Peck*	
35.237133	l	64	32	4	1 *Bushel*

Liquid Capacity System

AMERICAN LIQUID CAPACITY SYSTEM (1707 - present)

This system is based upon the English system identified as the Queen Anne Winchester Wine Gallon System and was based upon the gallon measuring 231.0 *cubic inches*. This table was prepared from measures given in Doursther 1840, N.C.R.P. 1883, Funk 1926, Asimov 1960, Skinner 1967 and Judson 1976.

METRIC													
0.0616	ml	1 *Minim*											
3.695	ml	60	1 *Fluidrachm*										
29.57	ml	480	8	1 *Fluidounce*									
118.29	ml	1920	32	4	1 *Gill*								
473.15	ml	7680	128	16	4	1 *Pint*							
946.30	ml	15,360	256	32	8	2	1 *Quart*						
3785.2037	ml	61,440	1024	128	32	8	2	1 *Gallon*					
34.07	l	552,960	9216	1152	288	72	36	9	1 *Firkin*				
119.23	l	1,935,360	32,256	4032	1008	252	126	31.5	3.5	1 *Barrel*			
158.98	l	2,580,480	43,008	5376	1344	336	168	42	4.666...	1.333...	1 *Tierce*		
238.47	l	3,870,720	64,512	8064	2016	504	252	63	7	2	1.5	1 *Hogshead*	
476.94	l	7,741,440	129,024	16,128	4032	1008	504	126	14	4	3	2	1 *Pipe*
953.87	l	15,482,880	258,048	32,256	8064	2016	1008	252	28	8	6	4	2	1 *Tun*

Linear System

AMERICAN LINEAR SYSTEM (1305 - present)

This is the same system used in England identified as the English or Primary Standard Linear System and based upon the *yard* of 91.438348 cm. After 1893 the *yard* was recognized as 3600/3937 m, or 91.440183 cm, and after 1959 it was 91.44 cm (Doursther 1840 and Judson 1976).

Superficial System

AMERICAN AREA SYSTEM (1305 - present)

This is the same system used in England and identified as the English Area System.

Volumetric System

AMERICAN VOLUME SYSTEM (1305 - present)

This is the same system used in England and identified as the English Volume System.

CANADIAN SYSTEMS OF WEIGHTS AND MEASURES

As in America, European settlers in Canada imported contemporary and anachronistic metrological units and systems from their homelands. With the development of political organizations within Canada, various regions adopted English and/or French units and systems as their own colonial or provincial units and systems. For example, the General Assembly of Nova-Scotia formally adopted contemporary English metrological systems in 1758, while Quebec adopted French units and systems in 1676 and English units and systems in 1799.

Once systems were adopted, provinces were subsequently reluctant to revise or replace them. Even when parent countries adopted new systems, the colonies and provinces continued to use their earlier systems. Thus, most Canadian provinces retained their Winchester systems until 1873 when, after Confederation, the Imperial system formally became the national system.

No unique or new metrological systems were created by any of the Canadian colonies or provinces. All systems in common usage, as well as those codified in provincial law, were adopted from previously existing systems within either France or England. Lower Canada utilized a wide variety of local French units, even after 1676 when specific units and systems were officially mandated; and it was not until 1799, almost four decades after the end of the Seven Years' War, that Lower Canada officially adopted both English and French units and systems. Nova-Scotia (1758), New Brunswick (1786), Prince Edward Island [Island of St. John] (1795) and Upper Canada (1792) adopted English systems in the late 18th century; while Newfoundland (1834) and British Columbia (1867) adopted English systems in the mid-19th century; and Manitoba, Alberta and Saskatchewan adopted the Canadian-codified English systems when they joined Confederation in the late 19th and early 20th centuries.

Exact units and systems approved by provincial and federal assemblies and parliaments have been codified in specific acts on weights and measures (see Appendix A), as well as in various acts regulating commodity duties, markets and commercial products (e.g. bread, butter, beef, flour, grain, fish, etc.).

In 1871, the Parliament of Canada legalized the use of French Metric systems of weights and measures throughout Canada, and not until 1873 were the use of English systems officially defined in order to establish uniform systems for the entire Dominion of Canada. For Quebec, however, additional French linear and superficial units were also retained for land measure. Until 1873, metrological units and systems in Canada were defined by provincial statutes and laws.

Dry Weight Systems

All dry weight systems legally adopted within Canada were English dry weight systems, except for the French Metric weight system adopted by the Dominion of Canada in 1871 (following weights provided in Canadian legal statutes, 1676-1896; see Appendix A).

British Columbia, Including the Colonies of Vancouver Island and British Columbia (1858 - 1871)

Avoirdupois Pound Weight System (adopted 1867).
Troy Pound Weight System (adopted 1867).
Apothecary Weight System (adopted 1867).

New Brunswick (1784 - 1867)

Avoirdupois Pound Weight System (adopted 1786).
Troy Pound Weight System (adopted 1786).
After 1803, a *firkin* of butter was to weigh 60 *Avoirdupois pounds*.
After 1853, the following commodities were regulated by weight:

Bushel of wheat, Indian corn	=	60	*Avoirdupois pounds*
" " of rye, other grains, edible roots	=	56	" "
" " of barley, buckwheat	=	50	" "
" " of timothy seed	=	40	" "
" " of oats	=	36	" "
Ton of coal	=	2240	" "

After 1866, the *hundredweight* was 100 *Avoirdupois pounds* and the *ton* was 2000 *Avoirdupois pounds*.

Newfoundland (1832 - 1900)

Avoirdupois Pound Weight System (adopted 1834).
Troy Pound Weight System (adopted 1834).
After 1864, the following commodities were regulated by weight:

Bushel of wheat, peas, beans, edible roots	=	60	*Avoirdupois pounds*
" " of Indian corn	=	57	" "
" " of rye	=	56	" "
" " of flax seed	=	50	" "
" " of barley	=	48	" "
" " of hemp seed	=	44	" "
" " of oats	=	38	" "
Ton of coal	=	2240	" "
Barrel of pork, beef, jowls	=	200	" "
" " of flour, corn, oatmeal	=	196	" "
Half-barrel of pork, beef, jowls	=	100	" "
" " of flour, corn, oatmeal	=	98	" "
Bag of biscuits	=	112	" "
Half-bag of biscuits	=	56	" "

Nova Scotia (1758 - 1867)

Avoirdupois Pound Weight System (adopted 1758).
Troy Pound Weight System (adopted 1758).
After 1792, the following commodities were regulated by weight:

Bushel of peas	=	60	*Avoirdupois pounds*
" " of wheat, Indian corn	=	58	" "
" " of rye	=	56	" "
" " of barley	=	48	" "
" " of oats	=	34	" "

After 1794, beef and pork were to be sold by the *barrel* of 200 *Avoirdupois pounds* and the *half barrel* of 100 *Avoirdupois pounds*.

After 1796, a *sack* of meal or flour was to weigh 2 *hundredweights*, 2 *quarters* or 280 *Avoirdupois pounds*.

After 1850, flour and meal were to be sold by the *barrel* of 196 *Avoirdupois pounds* and the *half barrel* of 98 *Avoirdupois pounds*.

After 1864, the *hundredweight* was 100 *Avoirdupois pounds* and the *ton* was 2000 *Avoirdupois pounds*.

Prince Edward Island or the Island of St. John (1773 - 1873)

Avoirdupois Pound Weight System (adopted 1795).
Troy Pound Weight System (adopted 1795).
After 1837, the following commodities were regulated by weight:

Bushel of peas, beans	=	60	*Avoirdupois pounds*
" " of wheat	=	58	" "
" " of Indian corn	=	57	" "
" " of rye	=	56	" "
" " of barley	=	48	" "
" " of oats	=	36	" "

After 1869, the following commodities were regulated by weight:

Bushel of potatoes	=	65	*Avoirdupois pounds*
" " of turnips, carrots, beets	=	60	" "
" " of parsnips	=	56	" "

Quebec or Lower Canada (1663 - 1867)

Avoirdupois Pound Weight System (adopted 1799).
Troy Pound Weight System (adopted 1799).
After 1836, a *ton* of coal was to weigh 20 *hundredweight* or 2240 *Avoirdupois pounds*.

Upper Canada (1791 - 1867)

Avoirdupois Pound Weight System (adopted 1792).
Troy Pound Weight System (adopted 1792).
After 1835, the following commodities were regulated by weight:

Bushel of wheat, peas, timothy seed, clover seed	=	60	*Avoirdupois pounds*

Bushel of rye, Indian corn	=	56	*Avoirdupois pounds*
" " of beans	=	50	" "
" " of barley	=	48	" "
" " of oats	=	34	" "

After 1853, the following commodities were regulated by weight:

Bushel of beans	=	60	*Avoirdupois pounds*
" " of timothy seed, buck-wheat	=	48	" "

Province of Canada, Including Upper and Lower Canada (1848 - 1867)

After 1859, the following commodities were regulated by weight:

Bushel of wheat, peas, beans, edible roots, clover seeds	=	60	*Avoirdupois pounds*
" " of Indian corn, rye, salt	=	56	" "
" " of flax seed	=	50	" "
" " of barley, timothy seed, buck-wheat	=	48	" "
" " of hemp seed	=	44	" "
" " of castor beans	=	40	" "
" " of malt	=	36	" "
" " of oats	=	34	" "
" " of dried peaches	=	33	" "
" " of dried apples	=	22	" "
" " of blue grass seed	=	14	" "

After 1859, the *hundredweight* was 100 *Avoirdupois pounds* and the *ton* was 2000 *Avoirdupois pounds*.

After 1860, hay and straw were regulated by weight:

Ton of timothy, clover, other hay, straw	=	2000	*Avoirdupois pounds*
Bundle of timothy, clover, other hay with a withe band	=	16	" "
" " of timothy, clover, other hay with a timothy band	=	15	" "
" " of straw	=	12	" "

Dominion of Canada (1867 - 1900)

Metric Weight System (adopted 1871).
- the *metric ton* was known in Canada as a *millier*.

Avoirdupois Pound Weight System (adopted 1873).

Troy Pound Weight System (adopted 1873).

After 1873, the following commodities were regulated by weight:

Bushel of wheat, peas, beans, edible roots, clover seed	=	60	*Avoirdupois pounds*
" " of Indian corn, rye, salt	=	56	" "
" " of flax seed	=	50	" "
" " of barley, timothy seed, buck-wheat	=	48	" "
" " of hemp seed	=	44	" "

Bushel of castor beans = 40 *Avoirdupois pounds*
" " of malt = 36 " "
" " of oats = 34 " "
" " of dried peaches = 33 " "
" " of dried apples = 22 " "
" " of blue grass seed = 14 " "

After 1885, a *bushel* of bituminous coal was to weigh 70 *Avoirdupois pounds*.

After 1886, hay and straw were regulated by weight:

Bundle of timothy, clover, other hay with a withe band = 16 *Avoirdupois pounds*
" " of timothy, clover, other hay with a timothy band = 15 " "
" " of straw = 12 " "

Liquid Weight Systems

No examples of Canadian liquid weights systems were encountered.

Dry Capacity Systems

Throughout Canada, except for Quebec, English dry capacity systems were adopted. Quebec adopted English systems in 1799, but certain specified French units were allowed to remain in use until the Uniform Weights and Measures Act was adopted by the Dominion of Canada in 1873. Unfortunately, the exact size and relationships of the French units used in Quebec remain unknown. The only legally defined units which can be attributed to French units were the *bushel* and *chaldron* used to measure coal after 1836. In 1871, the Dominion of Canada also adopted the French Metric Dry and Liquid Capacity System. Information on capacity units and systems was obtained from Canadian legal statutes, 1676 - 1896 (see Appendix A).

British Columbia, Including the Colonies of Vancouver Island and British Columbia (1858 - 1871)

Imperial Dry Capacity System (adopted 1867).

New Brunswick (1784 - 1867)

William III Winchester Corn Capacity System (adopted 1786).

After 1793, a *hogshead* of lime was to have a dry capacity of 100 gallons.

After 1830, the following commodities were regulated by dry capacity:

Chaldron of coal = 12 *tubs* or 48 *bushels*.

Tub of coal, salt = 4 *bushels*.

NOTE: The measure *tub* has not been used in any metrological system yet identified. It may represent a unique local metrological unit for New Brunswick.

Newfoundland (1832 - 1900)

Imperial Dry Capacity System (adopted 1834).
- 3 *bushels* = 2 1/2 *heaped bushels*.
- *Hogshead* of coal = 63 *gallons*.

After 1896, a *barrel* of fresh herring was to have a dry capacity of 32 *gallons*.

Nova Scotia (1758 - 1867)

William III Winchester Corn Capacity System (adopted 1758).

After 1762, a *barrel* of pickled fish was to have a dry capacity of 31 1/2 *gallons*.

After 1789, a *tierce* of salmon was to have a dry capacity of 42 *gallons* and a *barrel* of pickled fish was to be 30 *gallons*.

After 1792, a *hogshead* of lime was to have a dry capacity of 96 *gallons* or 8 *heaped bushels*.

After 1794, beef and pork were to be sold by the *barrel* of 30-31 *gallons* and the *half barrel* of 15 1/2-16 *gallons*.

After 1798, pickled fish could also be sold by the *half barrel* of 16 *gallons*, the *quarter barrel* of 8 *gallons* and the *eighth barrel* of 4 *gallons*.

After 1828, pickled fish was to be sold by the *tierce* of 45-46 *gallons*, *barrel* of 29-30 *gallons* and the *half barrel* of 15 *gallons*.

After 1830, beef and pork were to be sold by the *barrel* of 27-28 *gallons* and the *half-barrel* of 14-15 *gallons*.

Prince Edward Island or the Island of St. John (1773 - 1873)

William III Winchester Corn Capacity System (adopted 1795).

After 1833, potatoes and turnips were to be sold by the *bushel*, with 3 *bushels* = 2 1/2 *heaped bushels*.

After 1841, potatoes and turnips were to be sold by the *bushel*, with 2 1/2 *bushels* = 2 *heaped bushels*.

After 1846, a *barrel* of lime was to have a dry capacity of 3 *bushels*.

After 1856, edible roots were to be sold by the *bushel*, with 2 5/8 *bushels* = 2 *heaped bushels*.

Quebec or Lower Canada (1663 - 1867)

In 1676, the following French or Paris measures were officially adopted:
- *Comme minot*
- *Demi minot*
- *Boisseau*

- *Pot*
- *Pinte*

Their precise capacities remain unknown.

In 1799, the English Dry Capacity System adopted was the William III Winchester Corn Capacity System. "Canadian measures" also retained were the *poisson, pot, half minot* and *minot* (precise capacities unknown). These Canadian measures may have come from the Système de capacité pour les matières sèches de Paris employé pour les grains et la chaux.

After 1836, coal was to be sold by the *chaldron* of 36 *bushels* (58.64 $feet^3$) and the *bushel* of 2814 9/14 $inches^3$ (46.120738 liters). This bushel is approximately equal to the French *boisseau* used in the Système de capacité pour les matières sèches de Paris employé pour le charbon (i.e. the *boisseau* of 45.54 liters), while the *chaldron* does not equate with any coal measure yet identified; it is roughly equivalent to 6 *minots* of the Système de capacité pour les matières sèches de Paris employé pour le charbon (i.e. the *chaldron* = 1660.3466 liters, while 6 *minots* = 1639.2 liters). In the French version of the Lower Canada statute for 1836 (i.e. 6 William IV, Chapter 36, Section 2), the *chaldron* is translated as a *voie*. However, the *voie* of the Système de capacité pour les matières sèches de Paris employé pour le charbon is 4098.00 liters, some 2 1/2 times larger than the *chaldron*. Presumably, the coal *bushel* and *chaldron* of Lower Canada, post-1836, correspond to some as yet unidentified, pre-existing French coal measures.

Upper Canada (1791 - 1867)

William III Winchester Corn Capacity System (adopted 1792).

Province of Canada, Including Upper and Lower Canada (1848 - 1867)

After 1859, a *chaldron* of coal was to have a dry capacity of 36 *Imperial bushels*. NOTE: This is an interesting adoption of a metrological unit (i.e. an English Imperial measure) by a province which had yet to adopt the entire metrological system. The Imperial Dry Capacity System was not adopted by either Upper or Lower Canada until its adoption by the Dominion of Canada in 1873.

Dominion of Canada (1867 - 1900)

Metric Dry and Liquid Capacity System (adopted 1871).
- the units *millilitre* and *huitime* were not adopted.

Imperial Dry Capacity System (adopted 1873).

Until 1880, the *bushel* of the William III Winchester Corn Capacity System was allowed to continue in use.

After 1879, a *barrel* = 25 *gallons*.

Liquid Capacity Systems

All liquid capacity systems adopted within Canada were English liquid capacity systems, except for the Système métrique français de capacité pour les matières sèches et les liquides adopted by the Dominion of Canada in 1871 (following liquid capacities provided in Canadian legal statutes, 1676-1896; see Appendix A).

British Columbia, Including the Colonies of Vancouver Island and British Columbia (1858 - 1871)

Imperial Liquid Capacity System (adopted 1867).

New Brunswick (1784 - 1867)

Queen Anne Winchester Wine Gallon System (adopted 1786).

Newfoundland (1832 - 1900)

Imperial Liquid Capacity System (adopted 1834).

Nova Scotia (1758 - 1867)

Queen Anne Winchester Wine Gallon System (adopted 1758).

Prince Edward Island or the Island of St. John (1773 - 1873)

Queen Anne Winchester Wine Gallon System (adopted 1795).

Quebec or Lower Canada (1663 - 1867)

Queen Anne Winchester Wine Gallon System (adopted 1799).

Upper Canada (1791 - 1867)

Queen Anne Winchester Wine Gallon System (adopted 1792).

Province of Canada, Including Upper and Lower Canada (1848 - 1867)

No new systems were adopted, rather the Queen Anne Winchester Wine Gallon System continued in use.

Dominion of Canada (1867 - 1900)

Metric Dry and Liquid Capacity System (adopted 1871).
- the units *millilitre* and *huitime* were not adopted.

Imperial Liquid Capacity System (adopted 1873).
Until 1880, the *gallon* of the Queen Anne Winchester Wine Gallon System was allowed to continue in use.

Linear Systems

Throughout Canada, except for Quebec, English linear systems were adopted. Quebec adopted the English or Primary Standard Linear System and the French Système de longueur du pied du roi in 1799, and after the Uniform Weights and Measures Act was adopted by the Dominion of Canada in 1873, Quebec retained only three linear units for land measurement. In 1871, the Dominion of Canada also adopted the French Système métrique du longueur. Information on linear units and systems was obtained from Canadian legal statutes, 1676 - 1896 (see Appendix A).

British Columbia, Including the Colonies of Vancouver Island and British Columbia (1858 - 1871)

Imperial Linear System (adopted 1867).

New Brunswick (1784 - 1867)

English or Primary Standard Linear System (adopted 1786).

Newfoundland (1832 - 1900)

Imperial Linear System (adopted 1834).

Nova Scotia (1758 - 1867)

English or Primary Standard Linear System (adopted 1758).

After 1792, bricks had to measure 8 *inches* X 4 *inches* X 2 *inches*.

After 1816, large bricks had to measure 9 *inches* X 4 3/8 *inches* X 2 1/2 *inches*, while small bricks had to measure 8 1/4 *inches* X 4 *inches* X 2 *inches*.

Prince Edward Island or the Island of St. John (1773 - 1873)

English or Primary Standard Linear System (adopted 1795).

Quebec or Lower Canada (1663 - 1867)

In 1676, the *aulne* [i.e. *aune*] and *demie aulne* [i.e. *demi aune*] were officially adopted. Unfortunately, the precise length of these units remains unknown.

In 1799, the English or Primary Standard Linear System and the French Système de longueur du pied du roi were adopted.

Upper Canada (1791 - 1867)

English or Primary Standard Linear System (adopted 1792).

Province of Canada, Including Upper and Lower Canada (1848 - 1867)

No new systems were adopted, rather the English or Primary Standard Linear System and the French Système de longueur du pied du roi continued in use.

Dominion of Canada (1867 - 1900)

Metric Linear System (adopted 1871).
Imperial Linear System (adopted 1873).
After 1873, only three French linear units were allowed to be used for land measure in parts of Quebec under seigniorial tenure:
French or *Paris foot* (i.e. *Pied du roi*) = 12.79 *inches* (32.487 cm).
Perch = 18 *French feet* (5.848 meters).
Arpent = 180 *French feet* (58.476 meters).

Superficial Systems

Throughout Canada, except for Quebec, the English Area System was the only superficial system adopted. Quebec adopted the English Area System and the French Système de surface du pied du roi in 1799, and after the Uniform Weights and Measures Act was adopted by the Dominion of Canada in 1873, Quebec retained only two area units for land measurement. In 1871, the Dominion of Canada also adopted a modified or shortened version of the French Système métrique du surface. Information of superficial units and systems was obtained from Canadian legal statutes, 1676 - 1896 (see Appendix A).

British Columbia, Including the Colonies of Vancouver Island and British Columbia (1858 - 1871)

English Area System (adopted 1867).

New Brunswick (1784 - 1867)

English Area System (adopted 1786).

Newfoundland (1832 - 1900)

English Area System (adopted 1834).

Nova Scotia (1758 - 1867)

English Area System (adopted 1758).

Prince Edward Island or the Island of St. John (1773 - 1873)

English Area System (adopted 1795).

Quebec or Lower Canada (1663 - 1867)

English Area System (adopted 1799).
French Système de surface du pied du roi (adopted 1799).

Upper Canada (1791 - 1867)

English Area System (adopted 1792).

Province of Canada, Including Upper and Lower Canada (1848 - 1867)

No new area systems were adopted, rather the English Area System and the French Système de surface du pied du roi continued in use.

Dominion of Canada (1867 - 1900)

CANADIAN METRIC SYSTEM (adopted AD 1871 - present)

METRIC

1	ca	1	*Centiare (ca)*		
100	ca	100	1	*Are (a)*	
10	a	1000	10	1	*Decare (da)*
100	a	10,000	100	10	1 *Hectare (ha)*

In 1873, the English Area System was officially adopted as the superficial system for the Dominion of Canada. Only two additional area units were allowed to be used for land measure in parts of Quebec under seigniorial tenure:
Perch = 324 *French feet*^{2} (34.194 ca).
Arpent = 32,400 *French feet*^{2} (34.194 a).

Volumetric Systems

No examples of Canadian volumetric systems were encountered, but use of both English and French volumetric systems could be expected.

APPENDIX A. ACTS AND ORDINANCES REGULATING WEIGHTS AND MEASURES USED WITHIN CANADA AND ITS PROVINCES DURING THE 17TH THROUGH 19TH CENTURIES

QUEBEC	Ordonnances des Intendants et Arrêts portant Réglements du Conseil Supérieur de Québec 1676 Reglemens, Généraux pour la Police, Section 4.
QUEBEC	Complément des Ordonnances et Jugements des Gouverneurs et Intendants du Canada 1730 Ordonnances de Gouverneurs et Intendants du Canada, sur la Voirie et la Police, Ordonnance qui ordonne à tous Marchands et Négociants de Montréal de faire marquer et étalonner leurs Poids et Mesures, et qui enjoint au Lieutenant-Genéral de les vérifier tous les six mois, à peine de 10 lbs. d'amende; du vingt-deuxiéme Juillet, mil sept cent trente.
QUEBEC	Complément des Ordonnances et Jugements des Gouverneurs et Intendants du Canada 1732 Ordonnances de Gouverneurs et Intendans du Canada, sur la Voire et la Police, Ordonnance qui enjoint à tous négociants, marchands, boulangers, bouchers, cabaretiers, regattiers et tous autres, de faire marquer et étalonner leurs Poids et Mesures au greffe de la Prévôté de Québec, sous peine de 10 lbs. d'amende; du neuvième Août, mil sept cent trente-deux.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1758 Act 32 George II, Chapter 16, An Act for preventing frauds by Butchers and Fishmongers.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1758 Act 32 George II, Chapter 21, An Act relating to the Assize of Bread, and for ascertaining the standard of Weights and Measures, Sections 1-3, abridged by Title 104.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1759
Act 33 George II, Chapter 6, An Act in addition to an Act, entitled, An Act relating to the Assize of Bread, and for ascertaining the Standard of Weights and Measures, made and passed in the thirty-second Year of His Majesty's Reign, Sections 1-3, abridged by Title 104.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1760
Act 34 George II, Chapter 6, An Act for establishing a Public Market at the Market House in Halifax, and for regulating the same.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1762
Act 2 George III, Chapter 8, An Act for regulating the exportation of Fish, and the assize of Barrels, Staves, Hoops, Boards, and all other kind of Lumber; and for appointing Officers to survey the same, Sections 1-16, abridged by Title 33.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1763
Act 3 George III, Chapter 3, An Act to prevent Frauds in the selling of Beef, Pork, Flour, and Biscuit, or Ship Bread in Casks, Sections 1-5, abridged by Title 10.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1764-1765
Act 4-5 George III, Chapter 4, An Act, to repeal part of an Act made and passed in the Third Year of his Majesty's Reign, entitled an Act to prevent Frauds in the selling of Beef, Pork, Flour, and Biscuit of Ship Bread in Casks, Sections 1-2.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1764-1765
Act 4-5 George III, Chapter 5, An Act in further addition to, and amendment of an Act, entitled, An Act relating to the Assize of Bread, and for ascertaining the Standard of Weights and

Measures, made and passed in the Thirty Second Year of His late Majesty's Reign.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1766
Act 6 George III, Chapter 5, An Act in further addition to and amendment of an Act made and passed in the thirty-third year of His late Majesty's reign, entitled An Act relating to the assize on Bread, and for ascertaining the Standard of Weights and Measures.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1766
Act 6-7 George III, Chapter 2, An Act in addition to and amendment of an Act, made and passed in the second year of His present Majesty's Reign, entitled, an Act for regulating the exportation of Fish, and the assize of Barrels, Staves, Hoops, Boards, and all other kinds of Lumber; and for appointing Officers to survey the same, abridged by Title 33.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1767
Act 7 George III, Chapter 4, An Act to explain and amend the several Acts of this Province, relating to the assize of Bread, and for ascertaining the standard of Weights and Measures, abridged by Title 104.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1771
Act 11 George III, Chapter 8, An Act for altering and amending an Act, made in the Thirty-Second year of His late Majesty's reign, entitled, an Act relating to the assize of Bread, and for ascertaining the Standard of Weights and Measures.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1775-1776
Act 15-16 George III, Chapter 3, An Act in addition to, and amendment of, an Act made in the Eleventh year of His present Majesty's reign, entitled, an Act for altering and amending an Act, made in the Thirty-Second year of His late

Majesty's reign, entitled, an Act relating to the assize of Bread, and for ascertaining the Standard of Weights and Measures.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1779
Act 19 George III, Chapter 9, An Act in further addition to, and amendment of an Act made in the Eleventh year of His present Majesty's reign, entitled, an Act, for altering, and amending an Act made in the Thirty-second year of His late Majesty's Reign, entitled an Act relating to the assize of Bread, and for ascertaining the standard of Weights and Measures.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1783
Act 23 George III, Chapter 16, An Act for establishing the standard Weight of grain, and for appointing proper Officers for measuring Grain, Salt and Coals, and ascertaining the standard size of Bricks.

NEW BRUNSWICK — Acts of the General Assembly of New Brunswick
1786
Act 26 George III, Chapter 15, An Act for the regulating Weights and Measures, Sections 1-2.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1789
Act 29 George III, Chapter 11, An Act in amendment of an Act, made in the Second Year of His present Majesty's reign, entitled, an Act for regulating the Exportation of Fish, and the assize of Barrels, Staves, Hoops, Boards and all other kind of Lumber, and for appointing Officers to survey the same, Sections 1-6, abridged by Title 33.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1789
Act 29 George III, Chapter 10, An Act in amendment of an Act, made in the Third year of His present Majesty's reign, entitled, an Act to prevent Frauds in the selling of Flour and Biscuit, or Ship Bread in Casks, abridged by Title 10.

NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1792 Act 32 George III, Chapter 4, An Act to revive, and amend, an Act for establishing the standard Weight of Grain, and for appointing proper Officers for measuring Grain, Salt, and Coals, and ascertaining the standard size of Bricks, and the quantity of Lime to be contained in a Hogshead, Sections 1-7, abridged by Title 41.
UPPER CANADA	Statutes of Upper Canada 1792 Act 32 George III, Chapter 3, An Act to Establish the Winchester Measure, and a Standard for other Weights and Measures throughout this Province, Sections 1-3.
NEW BRUNSWICK	Acts of the General Assembly of New Brunswick 1793 Act 33 George III, Chapter 7, An Act regulating the Size and Contents of Lime Hogsheads, within this Province, Sections 1-3.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1794 Act 34 George III, Chapter 9, An Act to regulate the packing and inspecting of Salted Beef and Pork, for Exportation, Sections 1-11, abridged by Title 9.
ISLAND OF ST. JOHN	Acts of the General Assembly of the Island of St. John 1795 Act 35 George III, Chapter 12, An Act for ascertaining the Standard of Weights and Measures in this Island, Sections 1-7.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1796 Act 36 George III, Chapter 8, An Act to regulate the Assize of Bread, Sections 1-21, abridged by Title 11.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1798 Act 38 George III, Chapter 2, An Act for regulating the exportation of Red, or Smoaked, Herrings, and in amendment of an Act, passed in

the second year of His present Majesty's Reign, entitled, An Act for regulating the exportation of Fish, and the assize of Barrels, Hoops, Boards, and all other kinds of Lumber, and for appointing officers to survey the same, Sections 1-11, abridged by Title 33.

LOWER CANADA

Provincial Statutes of Lower-Canada
1799
Act 39 George III, Chapter 7, An Act for the better regulating the Weights and Measures of the Province, Sections 1-9.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1799
Act 39 George III, Chapter 1, An Act for repairing, or rebuilding, the Market-House, erecting a Country Market-House, and regulating the several Markets in the Town of Halifax, and also to revive, alter, and amend, and bring into one Act, the Act for preventing frauds by Butchers, and Fishmongers, and the Act made in the Thirty-fourth year of His late Majesty's Reign, for regulating, and establishing, a public Market in the Town of Halifax, Sections 1-15, abridged by Title 62.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1802
Act 42 George III, Chapter 13, An Act to alter, and amend, an Act, passed in the Thirty-ninth year of His present Majesty's reign, entitled, An Act for Repairing or rebuilding, the Market-house, erecting a Country Market house, and regulating the several Markets in the Town of Halifax; and, also, to revive, alter and amend, and bring into one Act, the Act for preventing Frauds by Butchers and Fishmongers, and the act, made in the Thirty-fourth year of His late Majesty's reign, for regulating and establishing a Public Market in the Town of Halifax, Sections 1-2, abridged by Title 62.

NEW BRUNSWICK

Acts of the General Assembly of New Brunswick
1803
Act 43 George III, Chapter 6, An Act for regulating the Exportation of Butter, Sections 1-3.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1807
Act 47 George III, Chapter 17, An Act in further amendment of an Act, made in the second year of His present Majesty's reign, entitled, An Act for regulating the exportation of Fish, and the assize of Barrels, Staves, Hoops, Boards, and all other kind of Lumber, and for appointing Officers to survey the same, Sections 1-3.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1807
Act 48 George III, Chapter 22, An Act for making perpetual an Act, made in the thirty-sixth year of his present Majesty's reign, entitled, An Act to regulate the assize of bread.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1807
Act 48 George III, Chapter 23, An Act for making perpetual an Act to regulate the Packing and Inspecting of Salted Beef and Pork for Exportation.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1815
Act 55 George III, Chapter 16, An Act to regulate Markets in the Town of Halifax; and also, to repeal an Act, passed in the thirty-ninth year of His present Majesty's reign, entitled, An Act for repairing, or rebuilding, the Market House, and regulating the several Markets in the Town of Halifax; and also to revive, alter, amend, and bring into one Act, the Act for preventing Fraud by Butchers and Fishmongers, and the Act made in the thirty-fourth year of His late Majesty's reign, for regulating and establishing a Public Market in the Town of Halifax, Sections 1-6.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1816
Act 56 George III, Chapter 4, An Act in addition to, and in amendment of, an Act, passed in the second year of his Majesty's reign, entitled, An Act for regulating the exportation of Fish, and the Assize of Barrels, Staves, Hoops, Boards, and all other kind of Lumber, and for appointing

Officers to Survey the same; and also of an Act, passed in the thirty-second year of his Majesty's reign, entitled, An Act to revive and amend an Act, for establishing the standard weight of Grain, and for appointing proper Officers for measuring Grain, Salt and Coals, and ascertaining the standard size of Bricks, and the quantity of Lime to be contained in a hogshead, Sections 1-7.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1816
Act 56 George III, Chapter 21, An Act in addition to, and amendment of an Act, entitled, An Act to revive and amend an Act for establishing the Standard Weight of Grain, and for appointing proper officers for measuring Grain, Salt and Coals, and ascertaining the Standard Size of Bricks, and the Quantity of Lime to be contained in a Hogshead, Sections 1-7.

UPPER CANADA

Statutes of Upper-Canada
1823
Act 4 George IV, Chapter 16, An Act to repeal an Act passed in the thirty-second year of His Majesty's Reign, entitled "An Act to establish the Winchester Measure, and a Standard for other Weights and Measures throughout this Province," and to appropriate a sum of money for the purpose of obtaining a Standard for Weights and Measures for this Province, Sections 1-9.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1827
Act 8 George IV, Chapter 20, An Act in addition to the Act, passed in the Second year of His late Majesty's Reign, entitled, An Act for regulating the Exportation of Fish, and the assize of Barrels, Staves, Hoops, Boards, and all other kinds of Lumber; and for appointing officers to survey the same.

NOVA SCOTIA

Acts of the General Assembly of the Province of Nova-Scotia
1828
Act 9 George IV, Chapter 20, An Act for the more effectually enforcing the inspection, and encouraging the Exportation, of Pickled Fish, Sections 1-12.

NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1829 Act 10 George IV, Chapter 17, An Act to regulate the Weighing of Beef, Sections 1-5.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1829 Act 10 George IV, Chapter 30, An Act in amendment of the Act, entitled, an Act for the more effectually enforcing the Inspection, and encouraging the Exportation, of Pickled Fish, Sections 1-26.
NEW BRUNSWICK	Acts of the General Assembly of New Brunswick 1830 Act 10-11 George IV, Chapter 10, An Act to authorize the Justices of the Peace in the several Counties, in their General Sessions, to make regulations for Carmen, Waggoners, and Truckmen; and to establish the rates and fares to be taken for the Cartage and Truckage of goods, in the several Towns throughout the Province; and also to regulate the measurement of Coals and Salt, Sections 1-5.
NOVA SCOTIA	Acts of the General Assemblage of the Province of Nova Scotia 1830 Act 11 George IV, Chapter 6, An Act to regulate the Packing and Inspecting of Salted Beef and Pork for Exportation, Sections 1-14.
PRINCE EDWARD ISLAND	Acts of the General Assembly of Prince Edward Island 1833 Act 3 William IV, Chapter 19, An Act to repeal an Act made and passed in the Thirty-fifth Year of the Reign of His late Majesty King George the Third, entitled "An Act for ascertaining the Standard of Weights and Measures in this Island", and to make other Provisions in lieu thereof, Sections 1-10.
NEWFOUNDLAND	Acts of the General Assembly of Newfoundland 1834 Act 4 William IV, Chapter 9, An Act to regulate the standard of Weights and Measures in this Colony, and to provide for the surveying of Lumber, Sections 1- .

NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1834-1835 Act 5 William IV, Chapter 6, An Act to amend the Act to regulate the Assize of Bread, Sections 1-6.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1834-1835 Act 5 William IV, Chapter 24, An Act to continue the Act to regulate the Weighing of Beef.
UPPER CANADA	Statutes of the Province of Upper Canada 1835 Act 5 William IV, Chapter 7, An Act to establish a Standard Weight for the different kinds of Grain and Pulse in this Province, Sections 1-2.
LOWER CANADA	Provincial Statutes of Lower Canada 1836 Act 6 William IV, Chapter 36, An Act to regulate the Measurement of Coal, Sections 1-8.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1836 Act 6 William IV, Chapter 73, An Act to continue the Act to regulate the weighing of Beef.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1837 Act 7 William IV, Chapter 50, An Act to revive, as to the Town of Halifax, the Act to regulate the Assize of Bread.
NOVA SCOTIA	Acts of the General Assembly of the Province of Nova-Scotia 1837 Act 7 William IV, Chapter 85, An Act to continue the Act to regulate the Weighing of Beef.
PRINCE EDWARD ISLAND	Acts of the General Assembly of Prince Edward Island 1837 Act 7 William IV, Chapter 22, An Act for establishing the Standard Weight of Grain and Pulse, and for the appointment of Officers for measuring and weighing the same, Sections 1-5.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1838
Act 1 Victoria, Chapter 22, An Act to continue the Act concerning to regulate the Weighing of Beef.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1839
Act 2 Victoria, Chapter 9, An Act to authorize the sale of Coals by Weight, Sections 1-3.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1839
Act 2 Victoria, Chapter 11, An Act to continue and amend the Act to regulate the Weighing of Beef, Sections 1-4.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1840
Act 3 Victoria, Chapter 65, An Act to continue the Act to regulate the Weighing of Beef, and the Act in amendment thereof.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1840
Act 3 Victoria, Chapter 88, An Act to continue the Act to authorize the Sale of Coals by Weight.

UPPER CANADA — Statutes of Upper Canada
1840
Act 3 Victoria, Chapter 17, An Act to alter and amend an Act passed in the thirty-second year of the reign of His late Majesty George the Third, entitled, "An Act to establish the Winchester Measure throughout this Province," Sections 1-3.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1841
Act 4 Victoria, Chapter 107, An Act to continue and amend the Act to regulate the Weighing of Beef, and the Act in amendment thereof, Sections 1-4.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1841

Act 4 Victoria, Chapter 7, An Act to amend the Act relating to Weights and Measures, Sections 1-4.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1842
Act 5 Victoria, Chapter 11, An Act to revive the Act to amend the Act to regulate the Assize of Bread, Sections 1-2.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1842
Act 5 Victoria, Chapter 46, An Act to continue the Act to regulate the Weighing of Beef, and the Acts in amendment thereof.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1842
Act 5 Victoria, Chapter 73, An Act to continue the Act to authorize the Sale of Coals by Weight.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1843
Act 6 Victoria, Chapter 48, An Act to extend to the Town of Dartmouth the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1843
Act 6 Victoria, Chapter 63, An Act to continue the Act to authorize the sale of Coal by weight.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1843
Act 6 Victoria, Chapter 65, An Act to continue the Act to regulate the Weighing of Beef, and the Acts in amendment thereof.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1843
Act 6 Victoria, Chapter 68, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1844
Act 7 Victoria, Chapter 25, An Act to continue the Act to extend to the Town of Dartmouth the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1844
Act 7 Victoria, Chapter 36, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1844
Act 7 Victoria, Chapter 38, An Act to continue the Act to regulate the Weighing of Beef, and the Acts in amendment thereof.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1845
Act 8 Victoria, Chapter 69, An Act to continue the Act to extend to the Town of Dartmouth the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1845
Act 8 Victoria, Chapter 76, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1845
Act 8 Victoria, Chapter 78, An Act to continue the Act to regulate the Weighing of Beef, and the Acts in amendment thereof.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1846
Act 9 Victoria, Chapter 38, An Act to regulate the Weighing and Selling of Beef, Sections 1-11.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1846

Act 9 Victoria, Chapter 97, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province on Nova-Scotia
1846
Act 9 Victoria, Chapter 99, An Act to continue the Act to extend to the Town of Dartmouth the Act to amend the Act to regulate the Assize of Bread.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1846
Act 9 Victoria, Chapter 8, An Act in addition to two several Acts, therein mentioned relating to Weights and Measures, Sections 1-6.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1847
Act 10 Victoria, Chapter 84, An Act to continue the Act to extend to the Town of Dartmouth, the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1847
Act 10 Victoria, Chapter 95, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1848
Act 11 Victoria, Chapter 54, An Act to continue the Act to extend to the Town of Dartmouth the Act to amend the Act to regulate the Assize of Bread.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1848
Act 11 Victoria, Chapter 24, An Act to continue the Act for establishing the standard weight of grain and pulse.

PROVINCE OF CANADA — Provincial Statutes of Canada
1849
Act 12 Victoria, Chapter 54, An Act to amend the

Law relative to the Inspection of Weights and Measures in Lower-Canada, Sections 1-12.

PROVINCE OF CANADA — Provincial Statutes of Canada
1849
Act 12 Victoria, Chapter 85, An Act to amend the several Laws therein mentioned, relative to the appointment and duties of Inspectors of Weights and Measures, in Upper Canada, Sections 1-14.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1849
Act 12 Victoria, Chapter 54, An Act to continue the Act to revive the Act to amend the Act to regulate the Assize of Bread.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1849
Act 12 Victoria, Chapter 55, An Act to continue the Act to Regulate the Weighing and Selling of Beef.

NOVA SCOTIA — Acts of the General Assembly of the Province of Nova-Scotia
1850
Act 13 Victoria, Chapter 7, An Act for the Weighing of Flour, Sections 1-13.

PROVINCE OF CANADA — Statutes of the Province of Canada
1853
Act 16 Victoria, Chapter 193, An Act to establish a Standard Weight for the different kinds of Grain and Pulse and Seeds in Upper Canada, Sections 1-4.

NEW BRUNSWICK — Acts of the General Assembly of New Brunswick
1853
Act 16 Victoria, Chapter 30, An Act regulating Weights and Measures, Sections 1-19.

NEW BRUNSWICK — Revised Statutes of New Brunswick
1854
Chapter 95, Of Weights and Measures, Sections 1-16.

PROVINCE OF CANADA — Statutes of the Province of Canada
1855
Act 18 Victoria, Chapter 135, An Act further to amend the laws concerning Inspectors of Weights and Measures in Upper Canada, Sections 1-2.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1856
Act 19 Victoria, Chapter 3, An Act to consolidate and amend the laws relating to weights and measures, Sections 1-18.

PROVINCE OF CANADA — Statutes of the Province of Canada
1858
Act 22 Victoria, Chapter 99, An Act respecting the Municipal Institutions of Upper Canada, Section 274, Inspectors of Weights and Measures.

PROVINCE OF CANADA — Statutes of the Province of Canada
1859
Act 22 Victoria, Chapter 21, An Act to amend the Laws of this Province relating to Weights and Measures, Sections 1-6.

PROVINCE OF CANADA — Statutes of the Province of Canada
1859
Act 22 Victoria, Chapter 55, An Act to make better provision for regulating the measurement of Coal, and for other purposes therein mentioned, Sections 1-7.

PROVINCE OF CANADA — Consolidated Statutes of Canada
1859
Act 22 Victoria, Chapter 53, An Act respecting certain Weights and Measures, Sections 1-8.

UPPER CANADA — Consolidated Statutes for Upper Canada
1859
Act 22 Victoria, Chapter 58, An Act respecting Weights and Measures, Sections 1-28.

PROVINCE OF CANADA — Statutes of the Province of Canada
1860
Act 23 Victoria, Chapter 7, An Act to establish a Standard Weight for Hay and Straw, Sections 1-3.

LOWER CANADA — Consolidated Statutes for Lower Canada
1861
Chapter 62, An Act respecting Weights and Measures, Sections 1-15.

LOWER CANADA — Consolidated Statutes for Lower Canada
1861
Chapter 63, An Act respecting the measurement of Coals and the Weight of Hay and Straw, Sections 1-9.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1862
Act 25 Victoria, Chapter 14, An Act for establishing the standard weight of grain and pulse, and for the appointment of officers for measuring and weighing the same, Sections 1-5.

NEWFOUNDLAND — Acts of the General Assembly of Newfoundland
1864
Act 27 Victoria, Chapter 14, An Act for Establishing the Standard Weight of Grain and Pulse, and to Regulate the Sale of Bread, Coals, and other Articles, Sections 1-17.

NOVA SCOTIA — Revised Statutes of Nova-Scotia
1864
Chapter 86, Of Weights and Measures, Sections 1-7.

PROVINCE OF CANADA — Statutes of the Province of Canada
1865
Act 28 Victoria, Chapter 6, An Act respecting the Weighing, Measuring and Gauging of certain Articles of General Consumption, Sections 1-23.

NEW BRUNSWICK — Acts of the General Assembly of New Brunswick
1866
Act 30 Victoria, Chapter 7, An Act relating to Weights, Sections 1-3.

NEWFOUNDLAND — Acts of the General Assembly of Newfoundland
1866
Act 29 Victoria, Chapter 9, An Act to continue and amend an Act passed in the Twenty-seventh Year of the Reign of Her present Majesty, entitled "An Act for establishing the Standard Weight of Grain and Pulse, and to Regulate the sale of Bread, Coals, and other articles," Sections 1-5.

BRITISH COLUMBIA — Ordinances passed by the Legislative Council of British Columbia
1867
Act 30 Victoria, No. 14, An Ordinance to establish a Standard of Weights and Measures, Sections 1-13.

BRITISH COLUMBIA — Ordinances passed by the Legislative Council of British Columbia
1868
Ordinance 31 Victoria, No. 1, An Ordinance to

establish a Standard of Weights and Measures, Sections 1-15. Also known as Laws of British Columbia (1871), Revised Statutes, Act No. 97.

PRINCE EDWARD ISLAND — Acts of the General Assembly of Prince Edward Island
1869
Act 32 Victoria, Chapter 6, An Act to add to the Act relating to Weights and Measures, Sections 1-2.

CANADA — Acts of the Parliament of Canada
1871
Act 34 Victoria, Chapter 24, An Act to render permissive the use of the Metric or of the Decimal System of Weights and Measures, Sections 1-4.

CANADA — Acts of the Parliament of Canada
1873
Act 36 Victoria, Chapter 47, An Act respecting Weights and Measures, Sections 1-54.

CANADA — Acts of the Parliament of the Dominion of Canada
1875
Act 38 Victoria, Chapter 36, An Act to compel persons delivering certain Merchantable Liquids in Casks to mark on such casks the capacity thereof, Sections 1-5.

CANADA — Acts of the Parliament of the Dominion of Canada
1877
Act 40 Victoria, Chapter 15, An Act to amend the Act respecting Weights and Measures, Sections 1-7.

CANADA — Acts of the Parliament of the Dominion of Canada
1879
Act 42 Victoria, Chapter 16, An Act to amend and consolidate the laws relating to Weights and Measures, Sections 1-55.

CANADA — Acts of the Parliament of the Dominion of Canada
1884
Act 47 Victoria, Chapter 36, An Act to amend the "Weights and Measures Act of 1879.", Sections 1-11.

CANADA — Acts of the Parliament of the Dominion of Canada
1885
Act 48-49 Victoria, Chapter 64, An Act further to amend the Acts relating to Weights and Measures, Sections 1-4.

CANADA	Acts of the Parliament of the Dominion of Canada 1886 Act 49 Victoria, Chapter 40, An Act in further amendment of the "Weights and Measures Act of 1879."
CANADA	Revised Statutes of Canada 1886 Revised Act 49 Victoria, Chapter 104, An Act respecting Weights and Measures, Sections 1-68.
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