

XV. *A State of the English Weights and Measures of Capacity, as they appear from the Laws as well ancient as modern; with some Considerations thereon; being an Attempt to prove that the present Avoirdupois Weight is the legal and ancient Standard for the Weights and Measures of this Kingdom; by Samuel Reynardson Esq; F. R. S.*

Read March 9. 1748. **I**T is declared by (1) *Magna Charta* that there should be, throughout the Realm, one Measure of *Wine* (2), one of *Ale*, and one of *Corn*; viz. the *Quarter* (3) of *London*; and that it should be of *Weights* as of *Measures*.

This Declaration has been repeated in many subsequent Laws (4), and by several of them the Treasurer is directed to provide Standards of *Bushels*,
Gallons,

(1) c. 25.

(2) Bishop *Flectwood* says, it was a good Law of king *Edgar*, that there should be the same Weight and the same Measures throughout the Realm, but it was never well observed. *Cbron. pretiosum*, p. 34. — And, 2 *Inft.* p. 41. says, This Law was grounded upon the Law of God, *Deut. xxv. ver. 13, 14.* — and that there were good Laws for Weights and Measures made before the Conquest by *Canute*. See *Custom. de Norm.* c. 16.

(3) See p. 64. of this *Transact.* the Contents of a *Quarter*.

(4) 51 *H. III. St. 6.* 14. 25, and 27. *Ed. III.* 13, 15, and 16 *R. II.* 9 *H. VI.* 11 *H. VII. c. 4.* 16 *Car. I.* and 22 *Car. II cap. 8.*

Gallons; and Weights, of Brass; and to send them into every County; and all Measures are to be made according to the King's Standard; the Assize whereof is established by several Laws (1), as follows: 'The English Penny, called a Sterling round, without clipping, to weigh 32 Grains of Wheat dry, and taken from the midst of the Ear. 20 Pence make an Ounce. 12 Ounces a Pound. 8 Pounds make a Gallon of Wine (2). 8 Gallons of Wine make a London Bushel (3), which is the eighth Part of a Quarter.' And by other Laws (4) it is declared, That the Tun of Wine, Oil, and Honey, should contain, of the English Measure, according to the antient Assize, 252 Gallons; the Pipe or Butt 126; The Tertian 84; the Hogshead 63; and every Barrel $31\frac{1}{2}$, according to the old Assize, and to be gaged by the King's Gager.'

In the Reign of *Edward III.* (5) an Act passed to take away the Weight called *Ancell* (6), whereby, and by subsequent Statutes, it is directed, that every Sale and Buying should be by the even *Balance*.

In

(1) 51 *H. III. St. 1. c. 3.* 31 *Ed. I.* 12 *H. VII. c. 5.*

(2) The 12th *H. VII. c. 5.* says Wheat.

(3) 9 *H. VI. c. 8.* says — Buyers of Corn in *London* bought by a Vessel called a *Fat*, containing 9 Bushels of Corn; which is forbid by the Act.

(4) 2 and 18 *H. VI.* 1 *R. III. c. 13.* 5 *Ann. c. 27 § 19.* 23 *H. VIII. c. 7.* 2 *H. VI. c. 11.*

(5) 25 *Ed. III. St. 5. c. 9.* 34 *Ed. III. c. 5.* 8 *H. VI. c. 5.* 9 *H. VI. c. 8.*

(6) King *Stephen* (says *Knighton*) settled Measures of Length and of Land, and made Appointments *de Anfulis, Bilancibus, &c.* *Decem Scriptores, p. 2391.*

In the 11th Year of *Hen. VII.* Complaint being made to the Parliament, that the ancient Statutes and Ordinances of the Realm relating to Weights and Measures had not been observed and kept, it was therefore Enacted, ‘ That there should be delivered to the Knights and Citizens of every Shire and City, one of every Weight and Measure, which the King had caused to be made of Brass, according to his Standard in the Exchequer, to be delivered to the respective Places mentioned in the Act; and that the Inhabitants of all Cities, Boroughs, and Market-Towns, should make and use *Weights* and *Measures* made according to the Weights and Measures so delivered as aforesaid.’ In the next Year another Act passed, reciting, ‘ That the King had made such Weights and Measures of Brass, according to the *old* Standard thereof remaining within his Treasury; which Weights and Measures, upon more diligent Examination, had been *approved* defective, and not made according to the Statutes and *old* Laws, and were therefore recalled, and ordered to be broken, and other new Bushels and Gallons were directed to be made and *fixed*, according to a new Bushel and Gallon to be made according to the *Affize*, to remain in the King’s Exchequer:’ Where we now find a *Bushel* in the Custody of the Chamberlains called the *Winchester* Bushel (1), and a Gallon agreeing thereto: Upon the Bushel

(1) The first time I find it so called by any Law, is in an Act 22 C. II. c. 8.: And afterwards it is called by this Name in several Acts of Parliament; but in the Act just now mentioned, it is said

Bushel there is the following Inscription ; *Henericus septimus Dei gratia Rex Angliæ et Francia.*

In the last-mention'd Act, the *Affise* for Weights and Measures is in Substance the same as in the *old* Statutes, only the Pound is said to be the *Pound Troy* of 12 Ounces. But since by this and the former *Affise* Laws the Pound is directed to be raised from 240 Sterling Penies, it follows, that the Gravity of the *Affise* Pound was always the same ; but the Dimensions of Measures of Capacity respectively raised from a Pound of Wine, and a Pound of Wheat, will be in proportion to each other as the specific Gravity of Wheat to that of Wine or Water.

Thus continued the Laws relating to the *English* Standard of Weights and Measures till after the Restoration ; when a Duty of Excise (2) being laid upon Beer, Ale, and other Liquors, 36 Gallons taken by the Gage, according to the Standard of the Ale-Quart, (4 whereof made the *Gallon* remaining in the *Exchequer*) were to be reckoned as a Barrel of Beer, and 32 such Gallons a Barrel of Ale ; and afterwards (3) 34 such Gallons of Vinegar (and of Beer or Ale stronger or small without the Bills of Mortality) were declared to be a Barrel ; and all other Liquors liable
to

said to be *commonly* called the *Winchester* Measure. Perhaps it first took that Name from the Statute made at *Winchester* 16 R. II. which directs the Clerk of the Market to have all his Weights and Measures ready, and marked and signed according to the Standard of the *Exchequer*.

(2) 12 C. II. c. 24. § 20.

(3) 1 W. and M. c. 24. § 5. 10 W. III. c. 21. 11 and 12 ditto, c. 15.

to the Excise-Duty were to pay according to the *Wine Gallon*.

We now find the Officers of the Revenue determining the Contents of our Measures of Capacity with great Exactness: For, on the 25th of *May* 1688, two general Officers of the Excise, in the Presence of the Lord-Mayor, the Commissioners of Excise, Mr. *Flamstead*, and others, upon an exact Trial found that the *old Standard Wine Gallon*, kept in *Guildhall*, did contain but 224 cubic Inches; nevertheless, at that time it was thought convenient to continue the former supposed Content, being 231 cubic Inches, as the *Standard Wine Gallon*, and which has since been established by a Law (1).

In the Year 1696, an Experiment was made, in order to fix the true and exact Contents of the Brass *Standard Bushel* of *Henry VII.* which being filled with common Spring-Water, and the Water measured out with great Nicety and Exactness; the Bushel (2) was found to contain 2145,6 solid or cubic Inches; and the Water being weighed by the Standard Weights in the Exchequer (and by a Beam, which would turn with six Grains put into either Scale, with 30 Pounds in each Scale) was found equal to 1131 Ounces 14 Pennyweights *Troy*; and at the same Time and Place the Standard *Troy* Weights were compared with the Standard *Avoirdepois*, and 15 Pounds

(1) 5 *Ann. c.* 27. § 17. — This Act says, Any Cylinder 7 Inches Diameter, and 6 Inches deep, or any Vessel containing 231 cubical Inches, and no more, shall be a lawful Wine-Gallon.

(2) *Everard's Stereometry*, p. 193.

Pounds of the latter were found equal to 18 Pounds 2 Ounces 15 Pennyweights *Troy*; which fixes the Pound *Avoirdepois* at 7000 (1) such Grains, as the *Troy* Pound weighs 5760; and upon three several Trials, made by the Gentlemen of the *Council* of the *Royal Society*, at the Exchequer, upon a Medium the *Avoirdepois* Pound was found equal to 7000,25 *Troy* Grains.

By the first (2) *Malt Act*, which passed soon after the making the Experiment upon the *Winchester* Bushel, it is declared, that every Bushel 18 Inches and $\frac{1}{2}$ wide, and 8 Inches deep, should be esteemed a legal *Winchester* Bushel: And the *Coal* Bushel is directed (3) to be made 19 Inches and $\frac{1}{2}$ Diameter, and to contain the last Bushel and one Quart of Water. The first contains 2150,42 cubic Inches, the last 2217,47.

We now see different Measures established by Law (4); and under the Excise Laws, two different Gages or Measures, used for taking the Dimensions of *Wine* and *Ale* Vessels. The *Wine* Gallon contains 231 cubic Inches, and the *Ale* Gallon 282; but upon what Foundation this last Measure was established is difficult to determine.

Troy

(1) *Ward*, in his *Young Math. Guide*, says, 6999 $\frac{1}{2}$ Grains. *Phil. Transf.* N^o. 465. p. 181. and N^o. 470. — *Bishop Hoesper* 10. *Pharmacopœia Londin.* says, — The *Avoirdepois* Pound is said to be about 7000 Grains.

(2) 13 *W.* III. c. 5. § 28. and 1 *Ann. St.* 2. c. 3. § 10.

(3) 12 *Ann. St.* 2. c. 17. § 11.

(4) Though contrary to *Magna Charta*, and several other Laws not repealed.

Troy Weights had for some time been established and used for the Money Affairs in the *Mint*, and for weighing Gold, Silver, and some few Commodities; and the *Avoirdepois* were in general Use for weighing all heavy and gross Commodities. *Wine* Measure was generally look'd upon as equal to *Troy* Weight: From hence the Managers of the *Excise* Duty were perhaps led to fix the Standard of the *Ale* Gallon, bearing the same Proportion to the *Wine* Gallon as the *Avoirdepois* Pound did to the *Troy*; and according to this Conjecture, the two Gallons answer pretty exactly (1); the *Ale* Gallon exceeding the Proportion by somewhat more than one cubic Inch and one Quarter; but it exceeds the *Winchester* Gallon, or 268,2 cubic Inches by very near 14 cubic Inches: And not one of these Measures is agreeable to the Words of the *Assise*, which directs, (2) 'That the *Bushel* shall contain 8 Gallons of Wheat, 'the *Gallon* 8 Pound of Wheat of *Troy* Weight, 'the *Pound* 12 Ounces of *Troy* Weight,' &c. according to the *old* Laws of this Land.

It is very plain the Law-makers in *Henry* the VIIth's Time took the *Troy* Weight for the Standard; and most Authors who have wrote upon this Subject have follow'd their Example.

The great Difficulty we are under in fixing upon a *Standard Pound*, agreeable to the *Assise*, arises from the Uncertainty of the Rule laid down in our Laws
of

(1) For, as 144 : 175 :: 231 : 280, 729 — And as 144 : 175 :: 224 : 272, 222. This last comes very near the vulgar dry Gallon.

(2) 12 H. VII. c. 5.

of *Affise* for raising the *Pound* from 7680 Grains of *Wheat*; as these Grains differ in Weight, in different Countries, and in different Years, I might have said in the same Field, and in the same Year.

The Uncertainty of a *Pound* so raised might with great Probability occasion the Variety in our Weights and Measures, so often complained of in our *ancient* Laws, and for the Prevention whereof *Edward* III. in his 14th Year, ordered ‘ *Standard Weights* and ‘ *Measures* to be made of *Brass*, and sent into every ‘ *City* and *Town* in the Kingdom.’

The Laws of *Affise* never received any Alteration, except by the 12th of *Hen.* VII. when the *Pound* is declared to contain 12 Ounces of (1) *Troy* Weight, and the *Gallon* 8 Pounds of *Wheat* of *Troy* Weight; and since the Laws have received no Change, we have great Reason to conclude, that the *Standard Weights* themselves never suffer’d any Addition or Diminution; but however this be, we (2) now find in the Custody of the proper Officer of the *Exchequer*,

(1) This is the first time the *Standard Weights* are called *Troy* Weights. But in an Act 2 *H. V. St. 2. c. 4.* and 2 *H. VI. c. 13.* relating to *Goldsmiths*, there is mention made of *The Pound of Troy*.

(2) *Phil. Trans.* N^o. 470. — The *Avoirdepois* Weight of 14 Pounds is marked with a crowned E. and inscribed

XIIII POVNDE AVERDEPOIZ.

ELIZABETH. REGINA.

1582.

The *Troy* Weights marked with a crowned E. are Ounces, from 256 down to the 16th Part of an Ounce: And there are no whole Pounds *Troy*, *Peny* Weights, or *Grain* Weights, at the *Exchequer*. There not being Pounds, or greater Weights, seems to be a Proof that these Weights were never designed or used for determining the Weight of large Bodies, or heavy Goods,

quer 2 Setts of Weights, kept there as Standards; one called *Troy*, the other *Avoirdupois* Weight.

As there is no Account handed down to us by our Ancestors, shewing at what time, and upon what Occasion, these Weights, differing considerably in Gravity from each other, were there first deposited, we are at a Loss to determine which is the *ancient Standard Weight* described by the Laws of *Affise*.

The Act in the 12th of *Hen. VII.* has called the Standard Weight by the Name of *Troy Weight*; this is the first time the Weights are so called in any of our *Affise* Laws; and notwithstanding this Authority, it will be found very difficult, if not impossible, to reconcile the *Troy Weight* and *Measure* raised therefrom with the Words of the *Affise*, and any Measures now in being; for the natural and most ready Way to determine this Question is to compare both the *Troy* and *Avoirdupois* Weight with Measures raised from each, according to the Rule laid down in the *Affise*, and with such Measures as are or have been used by Authority.

‘ The most exact (1) and *geometrical* Way of expressing the Capacity of any Vessel or Measure is by expressing in known Terms the Solidity of a Body which will precisely fill it: The fittest will be Water. The Solidity of all Bodies is best expressed by the Help of a Cube, whose equal Sides
‘ we

(1) Bishop Cumberland's Essay, p. 60. — who also says, The Egyptians made their *Arlob* the Cube of their known Standard the *Cubit*: — And that the Romans made their *Quadrantal* the Cube of their Standard the *Fect*.

‘ we know by a Standard Measure of Length ; and it
 ‘ appears, that this Way of determining Measures of
 ‘ Capacity is not only the most geometrical, but
 ‘ also exceeding ancient (2)’. By this Rule some
 Gentlemen at *Oxford*, in the Year 1685, determined
 the Weight of a *cubic* (3) *Foot of Spring Water*, or
 1728 solid Inches, to be 1000 Ounces *Avoirdepois* ;
 and by the same Rule the Capacity and Contents of
 the *Standard Bushel* in the *Exchequer* was deter-
 mined in the Year 1696, with great Care and Exact-
 nefs: By the same Rule the Contents of other Ves-
 sels of Capacity have been settled ; and in the fol-
 lowing Table p. 71. I have inserted the Names of such
 Measures as are of any Authority, whose Contents
 are known ; by which the Proportion they bear to
 each other, and to Measures raised according to the
Assise, as well from the Pound *Troy* as the Pound
Avoirdepois, will be readily observed.

In the next place let us compare the Experiment
 made upon the *cubic Foot* of Spring Water with that
 upon the *Winchester Bushel*, and we shall find an
 uniform and perfect Agreement between them ; and
 that, upon each Trial, a cubic Vessel, the Sides
 whereof were equal to an *English Foot*, did contain
 (4) 1000 Ounces *Avoirdepois* of Spring Water. From
 hence

(2) *Measures of Bodies* are either determined by their solid Con-
 tents, or Weight. Measures of Content are formed from Cubes of
 assigned Lengths. Bishop *Hooper*, p. 2.

(3) *Phil. Transf.* N^o. 169.

oz.	pav.	Cu. In.	oz.	Cu. In.
(4) For as 1131.	14	<i>Troy</i> :	2145,6	:: 1000 <i>Avoir.</i> :: 1728,041.

Some Writers upon this Subject say, that a cubic Foot of Spring-
 Water

hence we are led to the Discovery of a *natural* and *universal Standard* for the *English Weights* and *Measures*; and such an one as is, in every respect, agreeable to the Words of the *Affise* recorded in our most *ancient* Laws.

Magna Charta points out the *Quarter* of *London* as the only Standard for Measures and Weights of that time; but we are left to guess of what Measure or Weight it was the Quarter Part. If we suppose it the Quarter of a *Ton*, or 2000 Pound Weight, then the *Quarter* was 500 Pounds, and the eighth Part of that, or a *Bushel*, was equal to a *cubic Foot*, or $62\frac{1}{2}$ Pounds; from whence less Measures and Weights were easily deduced. Subsequent *Affise Laws* direct the greater Measures to be raised from the less; that 8 Pounds should make a Gallon; 8 Gallons a Bushel; which was to be the eighth Part of a Quarter; and by this Rule the *Quarter* is raised to 512 Pounds, and the *Ton* to 2048 Pounds. These Measures and Weights are raised with Ease from known Parts of the *Foot*. For a cubic Vessel, whose Sides are equal to $\frac{1}{10}$ of a Foot, will contain a Cube of Spring Water equal to an *Ounce Avoirdepois*; and from hence, by a regular *geometrical Progression*, we shall obtain
Cubes

Water is equal to 76 Pounds *Troy*; which is 10 Pennyweights 20 Grains more than the 1000 *Avoirdepois*. See *Arbuthnot's Tables explain'd*, p. 80, 283. *Bishop Hooper's State, &c.* p. 11. — But the *Explainer* of *Arbuthnot's* Tables seems to have been quite ignorant of any Experiment since *Sir Jonas Moore's* Time; and to have disregarded the due Proportion between the *Avoirdepois* and *Troy* Pound; and for 175. to 144. his Tables, he says, are calculated at 17. to 14.

Cubes equal to ⁽¹⁾ 8—64—512 Ounces, or to 4—32—256—2048 Pounds *Avoirdupois*: And from a cubic Vessel containing one such Pound, we shall have other cubic Vessels, equal in Weight 8—64—512 Pounds; and in Measure to the *Gallon, Bushel* and *Quarter*, according to the *Affise*.

The ⁽²⁾ *Gallon, Bushel, and Quarter*, are called dry Measures; and are used for ascertaining the Quantity of Corn, and other dry Goods; the *Gallon* is also a liquid Measure raised from a *Pound*, in Liquids now called a *Pint* ⁽³⁾; from whence all the other liquid Measures are raised; but with this Difference in the Proportion, that the *liquid Bushel* is not 64, but 63 Pounds or Pints; eight whereof make the *Hogshead* equal to 63 Gallons; from whence the Contents, as well of the larger as smaller Vessels or Measures of Capacity are settled.

The *Measures of Capacity* thus raised, are sufficiently convenient for common Use, and are generally retained at this time; but for *Weights*, there has been some Variety from time to time, in the Composition of the larger sort, used for determining the Weight of Merchandize and heavy Goods, as will appear from the following Extract from several old Acts

(1) Eight Ounces are equal to a *Mark*, whereof two, or twice the Contents of that Cube make a Pound *Avoirdupois*.

(2) The Half-Bushel, Peck, Gallon, Pottle, and Quart, are directed by 25 *Ed. III. St. 5. c. 10.* to be made according to the King's Standard.

(a) See Bishop Hooper, p. 6.

(3) See Note (5) of p. 66. *infra*. — The *Pint* is not mention'd in the *Affise* Laws; but Bishop Hooper has given a long and learned Dissertation upon that Measure, and calls it the *Pint of Old*, p. 458.

Acts of Parliament.—The *Stone* for weighing *Lead* was ⁽¹⁾ settled at 12 *Pounds*; for *Wax*, *Sugar*, *Spices*, and *Allom*, at 8 *Pounds*; of which last, $13\frac{1}{2}$, or 108 *Pounds*, made the *hundred Weight*: The *Sack of Wool* ⁽²⁾ was to weigh but 26 *Stone*, 14 *Pounds* to each *Stone*: A *Weye* ⁽³⁾ of *Cheese* 32 *Cloves*, each *Clove* 7 *Pounds*. And for many Years past, the *Hundred weight* has been fixed ⁽⁴⁾ at 112 *Pounds Avoirdepois*, and that by a general Consent, and without any particular Law to establish it.

These *Weights* have been universally and immemorially ⁽⁵⁾ used in *England*, with an Exception to the weighing of *Gold*, *Silver*, and some very few *Commodities*, for which the *Troy Weight* has been used for a great many Years. When it was first introduced

(1) *Cay's Abridgment Title Weights*, § 9.

(2) 25 *Ed. III. St. 5. c. 9.* 13 *R. II. c. 9.*

(3) 9 *H. VI. c. 8.* The *Weye* equalled 224 *Pounds*.

(4) That is, 14 *Stone* at 8 *Pounds*, or 8 *Stone* at 14 *Pounds* each, according to the *Old Laws*, and present Usage of the *Stone Weight*. The 112 *Pound* is a very convenient *Weight* for a *Standard*, because it is divisible into more even *Parts* than any less *Number*. — And it is compounded from the *Affise Bushel*, its *Half* and *Quarter*; that is to say, 64.32, and 16 *Pounds*.

(5) The *Apothecaries* (who, next to the *Goldsmiths*, are supposed to make the most Use of *Troy Weights*) seldom keep *Weights* adjusted to the *Troy Pound* heavier than two *Drams*; but for all above buy and sell by *Avoirdepois*: And with them, by the Term *Libra* in Measure is meant the *Wine Pint*; tho' this Measure is not, say they, so denominated from its containing an exact *Pound-Weight* of any *Liquor*, and the Term *Uncia* in Measure does not denote a twelfth Part of the *Pint*, but the sixteenth; though in *Weight*, agreeable to its Signification, it is used to express one twelfth Part of a *Pound*; so that an *Ounce* in Measure is scarce more than three Quarters of an *Ounce* in *Weight*. See *Pemberton's Dispensary* p. 44.

introduced into this Kingdom, does no-where appear; but Mr. *Folkes*, in his Tables of the *English Silver Coins* (1), tells us, it was not established or used at the *Mint* before the 18th of *Hen. VIII.*

By reducing the *liquid Bushel*, or one Eighth of the *Hoghead*, from 64 to 63 Pints, it seems plain that our Ancestors took the *cubic Foot* for their *Model*; the Contents of such a Vessel being $62\frac{1}{2}$ Pints or Pounds: And from hence, and from what has been shewn before, it is not very unnatural to conclude, that at first our Ancestors fixed and established as well their Weights as Measures from known Parts of this Model; taking always a whole Number for each *primary Weight* or *Vessel*; and from thence proceeding, by a regular *geometrical* Proportion, to raise the greater Weights or Measures: So that the *English Foot* (the undoubted and universal *Standard* of all *Measures* of *Length* within this Realm) is also the *Standard* for the *Avoirdepois* (2) Weights, and all Measures of Capacity.

Upon

(1) Page 4. Mr. *Folkes* says, The Pound used at the *Mint* before that time, called the *Tower* or the *Moneys* Pound, was equal to 5400 *Troy Grains*: And, p. 13, 14, that the Weight of the *Groat*, from 13 *Hen. IV.* to 4 *Edw. IV.* was equal to 60 such Grains. Which is agreeable to what is said in an Act of Parliament of 2 *Hen. VI.* that the Pound *Troy* of coined Money was worth 32 Shillings; for 32 Shillings, or 96 Groats, at 60 Grains each, weigh 5760 Grains, or a Pound *Troy*. Tho', by the same Act, by reason of the Scarcity of Silver Money, and in order to bring Bullion into the *Mint*, it was enacted, That Silver uncoined, of the same Goodness as the Money, should be sold only for 30 Shillings the Pound *Troy*.

(2) The very Name *Avoirdepois*, by which our common Weights are known, has by some been looked upon as a Proof that they

Upon the whole therefore, I think it is sufficiently proved, that a *cubic Vessel*, whose Sides are equal to an *English Foot*, will contain 1000 Ounces *Avoirdepois*, or very near that Weight of Spring-Water : That Weights and Measures, deduced by a regular *geometrical Progression* from such a Vessel, or from cubic Vessels, whose Sides are equal to known Parts of an *English Foot*, bear an exact Analogy to each other, and to Weights and Measures raised from a *Pound*, according to the Words of our most ancient *Affise Laws*. This being considered, and that the *Avoirdepois* Weight is now in common Use for determining the Gravity of all heavy Bodies, that this
Weight

were of foreign Extraction. The first time I find the Word used in our Laws, is in an Act of *Ed. III. St. 1.* where it is applied to *Wines* as well as *Corn* ; as it is afterwards in *25 Ed. III. St. 3. c. 2.* and *16 R. II. c. 1.* And in an Act *27 Ed. III. St. 2. c. 10.* there is the following Clause:— ‘ Because we have perceived some Merchants buy *Avoirdepois* Merchandizes by one Weight, and sell by another, we will and establish, that *one Weight, one Measure, and one Yard*, be through all the Land ; and that *Wools*, and all manner of *Avoirdepois*, be weighed by even *Balance*.’ This King, in his 14th Year, had directed *Standard Weights* to be made of *Brass*, and sent into every *City and Town* ; and I conjecture, that those *Standards*, from the Words of the foregoing Clause, took the Name of *Avoirdepois*, and were the Weights by which the Merchants used to buy. What were the lighter Weights by which they sold, does not appear ; perhaps the *Pound Troy*. That the former were the *lawful Weights*, appears by an Act *24 H. VIII. c. 3.* where they are so called ; and Butchers, who before that time sold their Meat by Hand, were thereby obliged to provide themselves with Beams, Scales, and Weights *sealed*, called *Haberdepois* (for *Avoirdepois*) ; and in the next *Reign* the *Avoirdepois* Weights, now remaining as *Standards* in the *Exchequer*, were deposited there, as appears from the Name and Inscription thereon.

Weight now is, and immemorially has been, used for settling the ancient Duty of *Tonnage* and *Poundage* upon all Goods and Merchandize taken by Weight (except some few Drugs, which are charged in the Book of Rates by the Ounce *Troy*); and that there is not the least Proof, either in our *ancient* or *modern Laws*, to induce a Belief that this Duty was ever generally taken by the *Troy* Weight, or that *Troy* Weights were ever in general and common Use in this Kingdom, it must surely be allowed, that the Weight mentioned in our *old Laws*, or Acts of Parliament, was the *Avoirdepois* Weight.

Postscript.

The learned Bishop *Cumberland*, in his (1) Treatise, says, ‘ That our *English Avoirdepois* Ounce is the same as the *Roman* Ounce; and was probably introduced into this Kingdom by the *Romans*, when they gave Laws and planted Colonies here, and hath thence continued unchanged to this Day; which is not commonly observed, because we use the *Avoirdepois* Weights only about heavier Commodities; not in weighing Silver and Gold, which are weighed by the *Troy* Ounce; which I suppose was introduced by the *Normans*, because it takes its Name (2) from a *French* Town, *Troyes* in *Champaigne*.’ Most Authors (3) have been of this Opinion.

(1) See p. 11, 103, 107.

(2) Bishop *Hooper*, p. 432; of another Opinion as to the Derivation of the Name.

(3) See *Hooper's Inquiry*, p. 10, 14, 92. and *Arbuthnot's Tables explain'd*, p. 16, and 283.

Opinion. This leads me to compare our *English* Foot with the *Roman* Foot, which Mr. *Greaves* takes as equal to 967 such Parts, as ours is 1000. The *Roman Amphora* or *Quadrantal* is generally allowed ⁽¹⁾ to be equal to a *cubic Roman Foot*; and to contain 80 Pounds, or 960 Ounces. Then the Side of the *Amphora* is equal to ⁽²⁾ 986 Parts of the *English Foot*; agreeing exactly with the Foot deduced by *Villalpandus* from the *Congius* of *Vespasian*; and a cubic Vessel, whose Sides are equal to 967 Parts of the *English Foot*, will not contain ⁽³⁾ quite $904\frac{3}{4}$ Ounces; which, if true, reduces the *Roman Ounce* to near $412\frac{1}{2}$ Grains *Troy*.

(1) See Bishop *Hooper*, p. 152, 175. *Greaves's Mis. Works*, p. 198, 199, 297, 303.

(2) For the cube Root of 960 is $986,1$. And

(3) The Cube of 967 is but $904,231063$. And Mr. *Greaves* himself says, an *Amphora* made by the *Pes Colotianus* held only $7\frac{1}{2}$ *Congii*, equal to 900 *Roman Ounces*; which comes as near the Cube of 967, as can be expected from the uncertain Method he took to determine the Contents of that *Amphora*, which was by filling it with 7 *Congii*, and, as he guessed, about an half, of *Milium*. See his *Miscellaneous Works*, (1737) p. 225.

The Table of	Bushels in	Gallons in	Pints in	Weight of the Gallon in <i>Averdepois</i> Pounds.
	Cube Inch.	Cu. Inch.	Cu. Inch.	
By the Coal Act	2217,47	277,183	34,648	10,025
By the Malt Act	2150,42	268,8	33,6	9,722
<i>Winchester</i> Bushel	2145,6	268,2	33,525	9,6
From, the Wine Gallon	1848	231	28,875	8,354
The Guildhall Gallon	1792	224	28	8,101
16 Oz. <i>Averdepois</i>	1769,472	221,184	27,648	8
12 Oz. <i>Troy</i>	1456,0224	182,0028	22,75035	6,5826
The following are not supported by any Law or Authority:				
(1) The vulgar dry Meas.	2178 †	272,25	34,0625	9,8468
(2) The Ale Measure	2256	282	35,25	10,1995

(1) Dr. *Arbuthnot* gives a *Table* of the *vulgar dry Measure*, as the Contents of the *Winchester* Measure. And he had so little Regard for the *Averdepois* Weight, that he does not give any *Table* thereof.

(2) The *Ale Measure* even exceeds the *Coal Measure*. And the Excess of the *Ale Measure* above the *Winchester* is more than one in 20 of the last Measure.

(†) See the Note (1) p. 60.