with the barometer at 29∙0, and in water at 60∙2°, was 31381∙79 grains ; and adding to this the weight of an equal bulk of the air at 62°, which is 1/834·29/30 of that of the water, or 36·26 grains, and subtracting from it — of this, or 4∙26 grains, the buoyancy of the brass weights, we obtain 31413·79 grains for the weight of the cube of water in a vacuum at 60∙2°. Now this cube is less than the supposed measure, at the standard temperature of 62°, in the ratio of 1 to 1·0000567, on account of the contraction of the brass, and the water is denser than at the standard temperature, ac­cording to Mr Gilpin’s experiments, in the ratio of ∙99998 to ·99981, or of 1·00017 to 1; the whole correction for the difference of 1∙8° being ·0001133, or 3·55 grains, mak­ing 31410·24 for the weight of the cube of water in a va­cuum at 62°; which, divided by 124·1969, gives 252,907 for the weight of a cubic inch, in Sir George Shuckburgh’s grains.

“ In the same manner, we obtain for the cylinder, which was weighed in air under the same circumstances, and in water at 60·5°, the difference being 19006·83 grains, the correction 1/834·29/30·7·5/8·5 for the effect of buoyancy, amounting to 19·43 grains ; and for the difference of temperature of the water and brass conjointly, the densities being ·999955 and 999810, the correction 0·00145 — 0·00047 = ∙000095, or 1·80 grains, leaving + 17·63 grains for the whole cor­rection of the weight, as reduced to a vacuum at 62°, and making it 19024·46, which, divided by 75·2398, the content of the cylinder, affords us 252·851 for the cubic inch in a vacuum at 62°.

“ The sphere was weighed in air at 67³, the barometer standing at 29∙74 ; the correction for the buoyancy is here 7·5/8·5·29·74/30·1/843, or 28673·51 grains, 29·72; while the temperature of 66° requires, for the difference between tne expansion of brass and water, the addition of ·00042 — ·000126, or ·000294 of the whole, that is, + 8·43 grains, making the whole correction 38·15, and the weight in a va­cuum 28711·66; which, divided by 113·5264, gives us 252·907 for the cubic inch in a vacuum.

“ The mean of these three measures is 252·888, giving for the three errors + ∙019, —·037, and +·019; and this mean, reduced to the parliamentary standard, makes 252·722 grains for the cubic inch of distilled water at 62°, weighed in a vacuum, or 252·456 in air, under the common circumstances of the atmosphere, when weights of brass are employed. In a vacuum, at the maximum of density, that is, at 39°, the weight of a true cubic inch will be 253 grains, and of a cubic decimetre 15,440.@@κ The pro­posed imperial gallon of ten pounds, or 70,000 grains of water, will contain very nearly 277·3 cubic inches, under common circumstances.”

In conformity with these Reports, a bill was brought into the House of Commons in 1822 by Sir George Clerk, and again, with a few alterations, in 1823, which appears to have been drawn up with great care and judgment, and which comprehends a statement of the true ground of the propos­ed measures, and of the determinations which are intended for their bases.@@’

“ Whereas notwithstanding it is provided by the Great Charter, that there shall be but one measure and one weight throughout the realm, and by the Treaty of Union

between England and Scotland, that the same weights and measures should be used throughout Great Britain as were then established in England, yet different weights and mea­sures, some larger and some less, are still in use in various places throughout the united kingdom of Great Britain and Ireland, and the true measure of the present standards is not verily known, which is the cause of great confusion and of manifest frauds : Be it therefore enacted, That the straight line or distance between the centre of the two points in the gold studs in the straight brass rod now in the custody of the clerk of the House of Commons, whereon the words and figures ‘ Standard Yard, 1760,’ are engraved, shall be, and the same is hereby declared to be, the original and genuine standard of that measure of length or linear extension called a yard ; and that the same straight line or distance between the centres of the said two points in the said gold studs in the said brass rod, the brass being at the temperature of sixty-two degrees by Fahrenheit’s thermo­meter, shall be and is hereby denominated the ‘ Imperial Standard Yard,’ and shall be, and is hereby declared to be, the unit or only standard measure of extension wherefrom or whereby all other measures of extension whatsoever, whether the same be linear, superficial, or solid, shall be derived, computed, and ascertained ; and that all measures of length shall be taken in parts or multiples, or certain proportions of the said standard yard ; and that one third part of the said standard yard shall be a foot, and the twelfth part of such foot shall be an inch ; and that the pole or perch shall contain five such yards and a half, the furlong 220 such yards, and the mile 1760 such yards....

“ And whereas it is expedient that the said standard yard, if lost, destroyed, defaced, or otherwise injured, should be restored of the same length by reference to some inva­riable natural standard ; and whereas it has been ascertain­ed, by the commissioners appointed by his majesty to in­quire into the subject of weights and measures, that the said yard hereby declared to be the imperial standard yard, when compared with a pendulum vibrating seconds of mean time in the latitude of London, in a vacuum at thc level of the sea,...is in the proportion of thirty-six inches to 39·1393; Be it therefore enacted and declared, That if at any time hereafter the said imperial standard yard shall be lost, or shall be in any manner destroyed, defaced, or other­wise injured, it shall and may be restored by making, under the direction of the Lord High Treasurer...for the time being, a new standard yard, bearing the same proportion to such pendulum as aforesaid, as the said imperial standard yard bears to such pendulum.

“ And whereas the commissioners appointed by his ma­jesty to inquire into the subject of weights and measures have recommended that the standard brass weight of two pounds troy weight, made in the year 1758, and now in the custody of the clerk of the House of Commons, shall be considered as authentic ; Be it enacted, That a brass weight equal to one half of the said brass weight of two pounds, gravitating in air (the barometer being at thirty inches, and the thermometer being at 62° by Fahrenheit’s scale), 1822 [1823, be it further enacted, That the standard brass weight of one pound troy weight, made in the year 1758, now in the custody of the clerk of the House of Commons], shall be, and the same is hereby declared to be, the origi­nal and genuine standard measure of weight; and that such brass weight...shall be and is hereby denominated the Imperial Standard Troy Pound, and shall be, and the same is hereby declared to be, the unit or only standard

@@@1 It appears, however, from an official Report obligingly communicated to us by Dr Kelly, that the actual standard chiliogramme has been found to contain only 15,433 English grains.

@@@• [This act, of which only partial quotations of the principal provisions are given here, is nearly the same with the 5th Geo. IV. cap. 74, which was passed 17th June 1824, to come into operation 1st May 1825, but postponed by 6 Geo. IV. cap. 12, to 1st January 1826. Most of its provisions are still in force, and indeed were only rendered compulsory by 5 and 6 Will. IV. cap 63, from 1st January 1836 ; the principal parta repealed by the latter statute being the use of heaped measure, and of local and customary weights and measures.]