

will perhaps find reason to alter his sentiments in this point, and will perceive this truth established by his accurate reasonings upon the *Roman Estadal* still preserved at TOLEDO. For there being exactly the same difference between the *bar* of TOLEDO, and that of BURGOS, as there is between the *bar* of BURGOS, and the English yard: consequently, if the *bar* of TOLEDO was taken from the *Roman foot*, the English yard must come from the same source. The *bar* of BURGOS was, as I said, 33 inches, the *bar* of TOLEDO 36, the English yard 36, consequently these two last measures are *the same*.

THAT the antient foot of TOLEDO was the exact Roman foot, there can be no doubt; the Spanish and Roman measures, as well as weights being, for many ages, even after the division of the empire, the same thing. The GOTHS, tho' they pulled down that vast fabric, had an amazing reverence for the wisdom of its builders; they preserved with a religious care, not the names only, but the exact uniformity and correspondence, which subsisted between the Roman weights, moneys, and measures of all kinds, as BURRIEL hath proved from the authority of those two bishops IDACIUS and ISIDORE. And the MOORS did in great measure the same thing. You may see, by one trivial instance, how much the Roman weights and measures prevailed in SPAIN in after times: the style-yard, which is much in use among them at present, is called *Uno Romano* to this day, and by no other name.

FOR liquid measures the CASTILIANS use the *Açumbre*, which, as appears by the name, is an Arabic measure, and perhaps originally taken from the *Omer* of the Hebrews. The *Açumbre* contains two quarts English, or half a gallon. And the table of their liquid measure may stand thus:

<i>Dos Açumbres</i>	—	4 quarts	—	1 gallon.
<i>Un Açumbre</i>	—	2 quarts	—	$\frac{1}{2}$ gallon.
<i>Medio Açumbre</i>	—	1 quart	—	$\frac{1}{4}$ gallon.
<i>Uno Quartillo</i>	—	1 pint	—	$\frac{1}{8}$ gallon.

IF the quantity be greater, you then reckon by the *Arroba*, which is likewise another Arabic measure, and is exactly the quarter of the hundred, or 25 pounds English weight: for four *Arrobes* make the *Quintal*, or 100 pounds weight. But here again the *Arroba* is not the same throughout all SPAIN; for the pound of CADIZ and SEVILLE, and consequently the *Arrobe*, are much larger than those of CASTILE. In SPAIN almost every thing, whether dry or liquid, is sold by the pound, by the avoirdupois pound of 16 ounces, and consequently by the *Arrobe*: Thus wine, oil, wood, coals, corn, bread, salt, &c. are sold by the pound, and as many of these are usually purchased in large quantities, they are generally sold by the *Arrobe*. I make no doubt, but the usage of the old Roman pound of 12 ounces avoirdupois, or 10 troy, prevails still in some parts of SPAIN, tho' I am not able to prove it: As the standard of the *bar* has been kept at BURGOS, so the standard of the *Arroba* has been preserved at TOLEDO; and corn hath been regulated by the *Fanegue* of AVILA.

THE gold and silver-smiths weights are,

The *Quilate*, or *Carat*, 4 grains.

A *Tomin* = to 3 carats, 12 grains.

A *Castillan* = to 8 tomins.

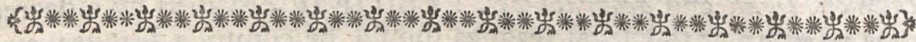
The *Ounce* = to 6 castillans and two tomins.

The *Castillan* is the gold weight of SPAIN, and is = to 14 rials and 16 peniques.

The *Mark* = to 8 ounces.

The standard of the *mark* for silver has been kept at BURGOS; but the standard of the gold *mark* at TOLEDO.

THIS may suffice for a short view of the *Castilian* measures and weights; for he who would give an accurate account of all which prevail in the several provinces of SPAIN, had need write a *folio*, and not a *letter*. Those who would wish to know with the greatest precision the exact length of the *Castilian bar* and *league* may find it in the following extract taken from Father BURRIEL'S book *Upon the Authority of the Laws of the Fuero Jusgo*.



Of *Spanish* Measures and Distances.

WE will now endeavour to fix the value of *The Bar of Castile*, to determine the length of *The Spanish League*, and consequently to discuss a very important point of modern geography.

THE *bar* is that *Spanish* measure from whence are derived all those which serve as measures of distance: and as long as its value is not fixed, it will be very difficult to ascertain justly the *Castilian League*. But this is only a part of the difficulty: it is not sufficient to know what is the number of *feet* that go to make a *bar*: it is necessary to search still farther, and find out what kind of *feet* they are, that is to say, whether they are *Spanish*, or *Roman* feet. Such is the question now before us. We have already said, That ALPHONSUS *the Wise* ordered all the cities and states to make their weights and measures after the standard of those which he had himself given to the city of TOLEDO. PHILIP II. found it convenient to annul in part so wise a decree, by ordering, in a declaration made 1568, that the *bar of Burgos* should be the universal bar of his monarchy. TOLEDO sacrificed, without difficulty, her pretensions to the public good, which ought to result from such uniformity; and conformed at first to the will of the prince, in sending to BURGOS for a copy of her bar; a copy, which TOLEDO has always preserved, and preserves to this day, with the greatest care. If all the cities of CASTILE had shewed the same vigilance as TOLEDO in the preservation of their bar, it is certain, that one should not see that vast difference between them, which is so visible at present. It was natural, that this change in the bar should have an influence in the ascertainment of distances, which it has been applied to measure; and this perhaps is the source of so many opinions which clash among those who have wrote upon the *Length of the Spanish League*, which of all the measures is the most important, and that which we have most frequently a necessity of knowing its real value.

THE Spanish writers make mention of *three* sorts of leagues, *common*, *legal*, and *geographical*. PHILIP II. ordained by a decree of 1587, that the legal leagues should be common leagues, and not legal leagues: it is difficult to comprehend the sense of this decree. For if the *common* league is an arbitrary distance, it would not serve as a rule in points where the property of individuals is concerned, where it is necessary to have a constant and determined measure.

AMBROSIUS MORALES and ESQUIVEL established it as a maxim, that by a *common league* we ought to understand a distance of 4000 paces, 20,000 feet, or $6666\frac{2}{3}$ bars. And this supposing after the researches of ESQUIVEL, that the antient Spanish foot was the third of the *bar of Castile*, which was without doubt the *bar of Burgos*: But those researches are posterior to the decree of 1587; and the authority of these two writers cannot serve to the interpretation of a law of PHILIP II. By the confession of all those who have come after them, there exists no such thing in SPAIN as *common leagues* of 4000 paces; nor can they any more take for a *common league*, those which the inhabitants of a province fix by their eye, or travellers and couriers by the watch: Because this league might serve at most to fix the space of ground to a traveller, but not to the surveyor, when it is necessary to measure the ground without roads, and in the most exact manner.

THE uncertainty is no less great as to the extent of the *legal league*: MORALES, who spoke of it before the decree of 1587, makes it 5000 bars, 3000 paces, 15,000 feet. MOYA gives it the same extent in his *Theoretical and Practical Geometry*, printed in 1563, and their estimations have been adopted by CESPEDES in the treatise of *Hydrography*, which he published in 1606, by order of PHILIP III. Pere MARIAUX, and Don GARCIA GABELLORO are of a different opinion; they make the legal league 5000 paces, or 25,000 feet.

By *geometrical leagues* we understand those, seventeen of which make a degree; but the existence of *equal leagues* has no foundation in theory, nor observation; and strangers have adopted them

them without examination, upon the credit of some Spanish authors, devoid of that instruction, which is necessary in a matter so important as this.

FROM what we have said, there results a new problem, namely to know, if it is possible, how to fix the number of Spanish leagues, which compose a degree. They cannot give a positive answer to this question, without having first a fundamental point from whence to deduce it. It is certain that we can know exactly the value, or length of the Spanish league, if one knew the number necessary to a degree: and also one should know how many of these leagues the degree contains, before one can be certain of the value of each of them.

IT is this last method which DON JORGE JUAN employed, when he was reducing the number of French toises into bars of CASTILE which a meridional degree contained, contiguous to the equator, measured by Messrs. GODIN, BOUGVERE, and LA CONDAMINE, to whom was associated, by order of the Spanish court, DON ANTONIO DE ULLOA. The Spanish geometrician, supported by the authority of many laws of the *Partida*, which he cites in his work, supposes with MOYA and CESPEDES, that the Spanish league contains 3000 paces, 15,000 feet: and this supposition becomes a principle in his hands, to proceed to the reduction proposed.

MR. GODIN, before he set out for PERU, had the attention to provide himself with a copy of the toise of the *Chatelet* at PARIS, which he drew with the greatest exactness, in order to make use of it in the measures which were the object of his voyage.

WHEN JORGE JUAN returned into SPAIN, he carried with him a copy of Mr. GODIN's toise, which he took with all those physico-mathematical precautions, which the desire of accuracy prescribed to him, and the importance of the work which he meditated. After having compared this copy of the French toise, at MADRID, with the bar which the council of CASTILE sent him, he found, that the bar of MADRID contained 374 lines of the

the French toise, and that the foot of the French toise was to the bar of MADRID, as 144 to 371. The observations made upon the equator gave 56,767 toises to a meridional degree, and it was easy to DON JORGE JUAN to reduce this number of toises to 132,203 bars: in dividing the relation which he had fixed between the foot of the toise, and the bar of MADRID; or in dividing 132,203 bars, which the degree contains, by 500, which is the number of bars that make a league, he found, that the degree contained 26 Spanish leagues and a half.

IT appeared, however, that it was not till after this reduction by DON JORGE JUAN, that they thought more seriously in SPAIN of the difference which there is between the bars of BURGOS, AVILA, and that of MADRID, upon which this geometrician had made his experiments. It was for this reason the late King FERDINAND VI. ordered, in 1750, several mathematicians to proceed to a geometrical comparison of these three bars. DON JORGE JUAN, who was one of these commissaries, determined with his colleagues, that six Paris feet made seven Castilian; that is to say, that the French toise was exactly $2\frac{1}{3}$ bars Spanish. His majesty ordered that for the future, they should abide by this decision in all affairs relating to war, and the marine.

YOU see then the number of bars contained in a Spanish league, the number of Castilian leagues which form a degree, and the number of feet of which the degree is composed, determined and fixed in adopting the calculation of DON JORGE JUAN. It now remains to determine the nature of these feet.

DON JORGE JUAN thought, that the feet, of which mention is made in the laws of the *Partidas*, were Castilian feet, and such is, as far as appears, the sentiment of CESPEDES, MORALES, MOYA, and the council of CASTILE itself.

HOWEVER respectable these authorities may seem, Pere BURRIEL thought he ought not to stop there: he pretends, on the contrary, that the feet mentioned in the laws of the *Partidas*, and 15,000 of which make a Spanish league, are ROMAN FEET. The

The method by which he came to the demonstration of this proposition, for we look upon it as demonstrated, is equally solid and ingenious, and gives a new proof of his sagacity.

WE will now enter into the discussion of his proofs, undertaking with him things a little higher.

IT is evident, that if we could know the length of the bar which ALPHONSUS X. gave to TOLEDO, we should immediately know the kind of foot, which He used, and which is spoke of in the laws of the *Partidas*, since from one unanimous consent the foot hath always been the third of the bar. Then we should observe, that when the representatives of the states, held at TOLEDO in 1436, wanted to take away from the measures of that city the prerogative of being universal models, they alledged, among other reasons, that the bar of TOLEDO exceeded by an eighth that of BURGOS. The animosity of the deputies of BURGOS was so great, as they were the leaders of the cabal, it might make us believe, that this excess was exaggerated, and that the bar of TOLEDO did not surpass that of BURGOS but by a twelfth, and not an eighth. If the states fixed this excess at an eighth, it was, without doubt, because in the divisions of the bar, one sees parts marked as eighths, but no twelfths. By consequence, the bar of TOLEDO surpassed that of BURGOS by three inches: and the foot of the bar given to TOLEDO by ALPHONSUS X. was greater than that of BURGOS by one inch, which is the twelfth part. Besides, all the authors, who have compared the Roman foot to the Spanish foot, assure us, that the Roman foot of the capital is one twelfth more in length, than the foot of CASTILE. Therefore the antient foot of TOLEDO, or that of the bar of ALPHONSUS X. was equal to the Roman foot.

IF TOLEDO still preserved its antient bar, it would be easy to bring experience to the support of this reasoning; by confronting this bar with that of BURGOS: but since this bar exists no longer, we will make use of a measure which was taken from it. The measure I mean is the antient *Estadal* which one still sees in the archives of TOLEDO.

THE *Estadal* passes commonly in SPAIN for a measure of eleven feet; the antient *Estadal* which we see at TOLEDO is exactly ten feet ten inches: now I cannot be persuaded, that the old Spaniards, whose attention was so extreme for every thing that regarded oeconomic government, should give to the *Estadal*, to a measure which is so frequently in use, the unequal number of eleven feet, or the fractionary one of ten inches. It is much more probable that they gave it the equal length of 8, 10, or 12 feet.

As the antient *Estadal* of TOLEDO, which, as we have said, was taken from the bar of ALPHONSUS X. contains 10 feet, 10 inches, then, if the *Estadal* ought to be a measure of 10 feet, the antient exceeds the modern precisely one 12th; each foot of the antient *Estadal* surpasses also, by one twelfth, each foot of the modern: in fine, the bar of ALPHONSUS X. was one twelfth greater than that of CASTILE. From whence we must conclude, that the foot of that bar had the same proportionate excess beyond the Castilian foot, that the Roman foot had; consequently the laws of the *Partidas* speak of Roman feet, when they fix the paces and the feet of which a league is composed. Therefore in following these laws, the Spanish league, which contains 3000 paces of five feet each, contains 15,000 Roman feet, or 3250 Castilian paces, or 16,250 feet of the bar of BURGOS, measured by the copy of that bar, which TOLEDO keeps in its archives.

THESE reasons are without doubt very strong; but the following reflections give them still a new degree of force. We cannot doubt, but that the foot, which was in use in SPAIN during the Roman government, was the common Roman foot: by consequence, if by the antient Spanish foot they understand that which the Spaniards used during the first ages of the Christian æra, it is certain it was the same as the Roman. How could the Romans, who took as much care of SPAIN as if they would make it a second ITALY, how would they have permitted, that the Spaniards should be distinct from the rest of the world (which it had conquered, and policed) in so essential a point, as that of weights and measures. The uniformity between the measures of the Spaniards

yards and those of the Romans subsisted after the division of the Empire, which never saw any change in that article in its provinces. This uniformity sustained itself even against the invasion of the barbarians, as appears from the authority of the Bishop IDACIUS, who was witness and historian of these invasions. This author always reckons distances by *milliaria*, which without doubt he could never have done, if it had not been the usage of the fifteenth century, in which he wrote. The writings of St. ISIDORE make us believe, that the GOTHs never touched the measures which the Spaniards had received from the Romans: because one may presume, from the known accuracy of that saint, that he could not have passed over in silence alterations of this nature, in the works which we have of his *De Ponderibus & Mensuris*: so far from it, he marks always the distances by the same names which the Romans gave them, and which they had introduced into SPAIN, with the measures which served to determine them. These reflections are supported in the work of Father BURRIEL, concerning *The Authority of the Laws of the Fuero Jusgo*, which he cites in great numbers, but always with a view to prove, that almost to the time of ALPHONSUS X. the weights and measures of the Romans continued to be used in Spain; and that they still reckoned the distances conformably to the manner which these conquerors had introduced. Could then this learned prince, who was an able and complete legislator, could he be ignorant, of this continuation of the Roman weights and measures? And if he knew it, as we ought to believe, considering the extent of his knowledge, and the lights he had, which shine much more in those of his works which exist in the obscurity of our archives, than in those which are printed: Could such a prince have recourse to foreign measures, when he determined and settled those which were to be used in his dominions, and of which he gave the originals to the city of TOLEDO?

of the division of the

This authority is not to be exercised by the
the authority of the Bishop
the authority of the Bishop
the authority of the Bishop
the authority of the Bishop

L E T T E R VI.

The works which we have of the
the works which we have of the
the works which we have of the
the works which we have of the
the works which we have of the

VIEW OF THE STAGE.

Incolumi gravitate jocum tentavit; eò quòd

Illecebris erat, & gratâ novitate morandus

Spectator, functusque sacris. — HORAT. ART. POET.

I AM induced to believe, that there is a resemblance between the stage of MADRID at this time, and that of ROME, when my author was describing it: that is, at a period after its infancy, and before it had arrived at its full perfection in propriety of action, sentiment, and taste. For I cannot well compare CALDERONI'S productions to those of TERENCE; nor look upon any of the present Spanish actors, as equal in merit and genius to the Roman ROSCIUS, an ÆSOP, or an English GARRICK. And tho' I venture to give this opinion, it is the opinion of one, who is only an eye, and not an ear-censor: For I pretend not to understand enough of the language to be able to judge as decisively as a French critic, of the dramatic merit of CALDERONI, or any of his poetical countrymen. But there certainly is a way of forming some judgement, tho' by other means; facts often speak as clearly as words; and actions and gestures, though silent, are by no means dumb: And I dare affirm, that General JOHNSON often understood *the little Carpenter*, a *Cherokee*, or *the bloody Bear*, though he was not a great master of the elegancies and purity of the Indian