TABLES
OF ANTIENT
COINS, WEIGHTS, and MEASURES,
Explained and Exemplified in Several
DISSERTATIONS.

By JOHN ARBUTHNOT, M. D.
Fellow of the College of Physicians, and of the Royal Society.

The SECOND EDITION.

To which is added,

An APPENDIX,
CONTAINING
OBSERVATIONS
ON
Dr. Arbuthnot's Dissertations on Coins, Weights, and Measures.

By BENJAMIN LANGWITH, D. D.

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MDCCLIV.
TO THE

KING.

* REAT Name, which in our Rolls recorded stands,
Leads, honors, and protects the learned Bands,
Accept this Offering, to thy Bounty due;
And Roman Wealth in English Sterling view.
Read here, how Britain, once despis'd, can Raise
As ample Sums, as Rome in Cesar's Day's;
Pour forth as numerous Legions on the Plain,
And with more dreadful Navies awe the Main.

[ *A ]

Tho'

* The King's Name stands first in the Buttery Books of Christ Church College, Oxon.
Tho' shorter Lines her fix'd Dominions bind,
Her Floating Empire stretches unconfin'd.
From *Thetis*’ Stores, and not her Neighbours Spoils,
She draws her Treasure, Fruit of honest Toils.
*Rome* sack'd, and plunder'd; *Britain* cloaths, and feeds;
Acquires their Riches, but supplies their Needs.
Sweet Seat of Freedom! Be thy happier Doom
To 'scape the Fate, as well as Guilt, of *Rome*.
Where Riot, Offspring of unwieldy Store,
Enerv'd those Arms, that snatch'd the Spoil before;
With costly Cates she stain'd her Frugal Board,
Then with ill-gotten Gold she bought a Lord.
Corruption, Discord, Luxury combin'd,
Down sunk the far-fam'd Mistress of Mankind.
Hear, Righteous Prince! O hear us loud invoke
Thy Worth unblemish'd, to avert this Stroke:
Your self so free from every Lawless View,
You scarce admit the Homage that is due.
Let other Monarchs, with invasive Bands
Leisen their People, and extend their Lands;

By
By gasping Nations, hated and obey'd,
Lords of the Desarts, that their Sword has made:
For Thee kind Heav'n a nobler Task design'd,
To fix thy Empire in thy Peoples Mind.
High on thy British Throne, to mark from far,
And calm the Billows of the rising War;
To smooth the Frowns on fair Europa's Face,
And force reluctant Nations to embrace.
As late the warring Winds, with mingled Roar,
Strugl'd to wreck, yet wafted you to Shore.
So shall the Storm, that threatens your peaceful Land,
Roll harmless o'er, or Burst where you Command.

CHARLES ARBUTHNOT,
Student of Christ Church, Oxon.
Believe it will be readily own'd that the Knowledge of the Value of the Money, Weights and Measures of the Ancients, is necessary to the understanding of their Writings. The Value of Coins, Weights and Measures is known, when the Proportion, which they bear to other known quantities of the same kind is determin'd, which are commonly those of the Reader's own Country. In order to assist English Readers in this particular, I publish'd about twenty Years ago some Tables, which being out of Print, it was suggested to me that if I would give the Copy, with some other Calculations relating to the same Subject, to my Son, he might make some Profit of them. This interested Motive I frankly own had its Share in producing the present Treatise.

The first Tables were publish'd before the learned Dr. Hooper, Bishop of Bath and Wells, his Enquiry...
PREFACE.

Quiry into the State of Ancient Measures; which, if one considers the Uniformity of the whole Design, Accuracy of the Calculations, Sagacity of the Conjectures, Skill in restoring and comparing Passages of Ancient Authors, and the incomparable Learning that shines through the whole, excels very far all that was ever published upon the Subject; and indeed had my Design been merely the same with that of his Lordship, I should not have presumed to have wrote any thing further on this matter. As my Calculations differ'd not in any considerable matters from his Lordship's, I thought it was sufficient to take notice of those differences without changing the Tables in any material Article. New Books on useful Subjects, if not erroneous, are so far advantageous to Learning, that being put as it were by accident into a great many Hands, engage some to study a Matter which they would not otherwise have thought of.

I have been always of Opinion that young Gentlemen of an Age to consider more than the more Words of an ancient Author, ought not only to take along with them the Chronology, Geography, and a clear Idea of the Antiquities form'd by ocular Inspection on Models and Figures; but likewise to
to exercise their Arithmetick in reducing the Sums of Money, Weights and Measures mention'd in the Author, to those of their own Country. And I will venture to affirm that any Youth who is not taught after this manner, is in some measure deceived. The Reader will find a great many Passages noted in the following Treatise, of which without this Knowledge he can neither understand the Terms nor Phraseology. It is in some measure necessary to explain Poets, Orators and Historians. But the Language of Manual Arts, Business, Traffick, &c. naturally obscure, is not intelligible without it. I believe I need not advertise the Reader that in a Work of this Nature it is impossible to avoid Puerilities, Trifles, and joyning things naturally incoherent, it being that in common with Dictionaries and Books of Antiquities.

The Faults (of which I am sensible there are a great many) are in some measure owing to my want of Leisure. The Mistakes are easily corrected from the Principles and Materials contain'd in the Book itself. With great Submission I deprecate the Wrath of all Criticks and Antiquaries, which is wont to be very flagrant on such Occasions. I do not value my
P R E F A C E.

my self on my Skill either in Languages, History or Antiquity; far less on the little Skill in Numbers which is demanded for the whole Performance, which, bating one Problem about Interest, requires no great depth of Calculation. I question not but any of them would have executed this Work better than my self. Besides, I have hardly Courage, I am sure not Leisure, to defend my self. Thus they see what they generally aim to prove, is no more than what I freely own before-hand.

It is the Product of Labour more than Judgment, consisting chiefly of Collections from several Authors, and for which I am much obliged to Hoftus's Historia Rei Nummariæ. I propose no Reputation by it, and I hope I shall lose none.
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A
DISSERTATION,
CONTAINING
The Principles and Authorities upon which the Tables are founded.

CHAP. I.
Of the Antiquity and Inventors of Money.

The Use of Money or stamped Metals in Commerce has been very ancient, and perhaps the Inventor of it is as hard to be discovered, as those of other Arts.

As it is usual in discourses of this nature to ascend as high as possible, we shall acquaint the Reader that the Inventor of Money was by some Jewish Writers believed to be Cain, Adam's eldest Son, to whom Josephus ascribes it: this Author tells you that Cain was the first monied man, that he taught his band luxury and rapine; and broke the public tranquility by introducing the use of Weights and Measures. (The word χρήματα in the Original may signify any 

* Aδέως ἐὰν τὸν ἀκομῇ πλῆθος χρήματων ἡμετερα- 
υπήρχει, ἔχουσαι οὐ πλιθωμένων καὶ τὴν ἀρχαγμοσύσ- 

τας ἤνε, ἀπὸ τοῦ διότατος τὸς ἄνωτά ἐμοὶ, ἢ πρώτον συμβαλλοντος ἑλθέν τὰς 

διάφορας περικοπάς, διδάσκαλος αὐτῶν τούτων, τοὺς καὶ ἐκεῖνοι μελετήσατε.
Tables of Ancient Coins,

any sort of possession as well as money.) If arguments a posteriori were to be used in this case, I should be very apt to give Cain the honour of the Invention; were he now alive, I'm sure it would rejoice his soul to see what mischief it had made among mankind. His lineal descendent and name-fake Tubal-Cain, probably must have had his art from him, for he was a great Artificer in Brass and Iron.

That Noah or Janus understood it, may be very well supported by his Image found upon the first Roman Coins: one side was stampt with a Janus bifrons, and the other with a Rostrum or Prow of a Ship. This is as good an argument as an Antiquary could wish for. The same is confirm'd by the Interpreter of Homer in Iliad 5, who faith that Janus first invented a Crown, a Ship, and Brass Money.

That there was current money in Abraham's time is past doubt, tho' it's not sure that it was stampt, for he is said to be rich in Cattle, in Silver and in Gold. Abimelech gave to Abraham as Sarah's brother 1000 Keseb or pieces of Silver. Joseph was sold by his Brethren for 20 pieces, and gave to his Brother Benjamin 500 pieces.

Amongst profane Writers there is one Phido an Argive or Greek, who is said to be the first who stampt money; but Herodotus with more reason ascribes the invention to the Lydians. Julius Pollux attributes it to Erichthonius amongst the Athenians and Lycians: Some to the Naxians, some to the Phoenicians, others to Iomus in Thessaly, as appears by some verses of Lucan. Celius gives it to a Lady, one Hermodice wife of Midas King of Phrygia. Amongst the Romans it stands between Numa and Servius Tullius: Pliny gives it to the latter, who was the first that stampt Brass, which the Romans

b Genef. c. 4. Στουμπαι ελγαδε εκλεκτη και ειδους, LXX. Interpretes. Maker of fa-
ber. in conspectiva operae Ξειρι & Ferti.

d Plin. lib. 33. cap. 3. In una quidem parte Janus gem-
minus ten bifrons, ex altera vero Rostrum Na-
vis fuit.

e Genef. c. 13. v. 2. e Genef. c. 20.

f Gen. 37. 2 Gen. 45. h Strabo lib. 8.

i Herodot. lib. 1. πρωτος ει των

abortaturos, των ημις τησον σωματα χρυσω και

αργυρου καιζαμων ιχρασιον.

k Jul Poll. lib. 9.

l Primus Theatialc rex totius Ionus

In formam catidis percussit pottida Maffi.

Fudit & argentum flammas, aurumque moneta.

Fregit, & immensus coxit fornicibus ara.

Hic quod populos scelestrae impetig in arma,

Divitias numerare datum est —

m Celius lib. 21. Antiqu. lec.

n Plin. lib. 33.

cap. 3. Servius Rex primus signavit, Es. antea

rudi usus Rome Timeus tradit. Signatum et

nota pecudum: unde & pecunia appellata.

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Weights and Measures, &c.

Romans used before unstamp'd. It seems an obvious invention by a publick stamp to save the people the trouble of weighing and essaying. Silver was stamped A. U. CCCCLXXXV, and Gold was coined sixty two years after. On the other hand, Suidas affirms that it was Numa the second King of the Romans who gave them the first money of Brass and Iron; for before his time they had no other but what was made of hides and shells, and that they were called from his own name Nummea. Thus much of the original of money; which has been a great conveniency in the commerce and affairs of mankind; but whether that will balance the mischief it has done, I shall not determine.

CHAP. II.

Of the Metals and other Materials that were commonly stamp'd into Money, and of some of the most common Impresses.

The Metals that Money was commonly made of amongst the Greeks, Romans and Hebrews, were Brass, Silver, and Gold; in the language of those several nations, Æs, Argentum, Aurum; ὀρχις, ἀξυγος, χρυς; Nabus, Kœph, Zabaw.

The first Coin being made of Brass, Æs, gave the Denomination to money in general among the Romans, and the whole turn of their expression is derived from it. Ære mutare, to buy or sell. Æs alienum, debt; Æs suum, what is owing to us. Æs circumforaneum by Cicero is understood money employed in Usury. ærarium, the Treasury, or place where the money is kept. æra-


Tables of Ancient Coins,

rii, Officers of the Mint. *Aerarii Milites,* Soldiers that served for pay. b *Aeruscari, Aeruscatores,* those who got money by scanda-
lous ways. c *Aderare, to set a price upon a thing. *Oberatus, op-
pres’d with debt.

*Argentum,* Silver, was used after the same manner for money in
general, tho’ not so frequently. *Argenti sitis & ssumes,* a desire
of money, or covetoussness. *Argentum consumere,* to spend money;
*Argento aliquem circumvenire,* to cheat. *Argentum locare favore,* to
lay out money at interest. *Argentarum facere,* to be an Usurer.
*Argentarum dissolvere,* to go off the Exchange, or to leave off be-
ing an Usurer. e *Argentum presentarium,* ready money.

*Aurum:* or Gold is used after the same manner. f *Auris sacra fa-
mes,* desire of Riches. *Vendidit hic auro patriam,* a corrupt Ralest
that sold his country for Gold or money. The *English* seldom
use Silver, but often Gold, for money in general.

b The Greeks used χαλκός and χαλκίον for money in general:
ἀχαλκός without money: ἀχαλκεῖν to be poor.  i χαλκεῖν to
play for money at even and odd. k χαλκίδιτις *Meretrix,*  &c.

*Αργύριον* is used in the same sense by the Greeks for a general
appellation of money.  τὸ ἀργυρίον καλέται χρήματα καὶ νο-
μίσματα, that is, Money and Riches are called αργυρίον.  m *Aργυ-
ριολογία,* to collect money.  *Αργυρολόγος,* a Collector of
Taxes,  &c.

Χέρυς is used in the same sense. n ἄργυρος, for poor, or desti-
tute of money.

*Nabu,* *Keseph* and *Zabaw* amongst the *Hebrews* signify money
in general; only *Keseph* when joined to a number signifies a piece
of Silver of a certain value: of which there are innumerable Ex-
amples in the Scripture. Those who are skill’d in the *Hebrew*
tongue say that there are a great number of words in that Lan-
guage to signify Gold.

As

b Fellus Pompeius  c In Cod. lib. 7a. i Apud Pollicem.  k Apud Josephum.  l Pol-
a Livius & Caesar.  e Cicero in Verrem.  lux lib. 3.  m Thucyd. Hist. 23, 8.  n Pla-
f Plautus.  g Virgilius.  b Hefychius in voce  to lib. 3. de Legibus.
χαλκός, τοῦ ὁμ γιὰ τὸ χρυσό εἶ ἡ το αργυρίον ἐς ὁμ.
Weights and Measures, &c.

Brass, or Copper, Silver and Gold have been the common metals for Coin; yet it has been made by barbarous Nations, and in necessitous Times, of other Materials; as Lead, Tin, Iron, Leather, Shells, and even of Wood and Barks of Trees: instances of which might be given, but are of little value as to the Coin itself.

Nummus some derive from Numa as was hinted before, tho' it was a word in use amongst the Greeks.

Moneta (from whence our word Money) comes from Moneo; because it admoniseth of the price, value, weight, &c.

Pecunia was so called from the figure of Cattle with which it was first stamp'd by Servius Tullius. And Robbing of the publick was called Peculatus. Peculum, quas pylla pecunia, a small Patrimony. Pecuniam exercere, to employ money. Otiosa pecunia, c. yov 
χηια, according to Demosthenes, money lying idle without interest. Some are of opinion that Pecunia was so called, from *Pecu-
dum Corio, from the Hides of beasts of which it was first made.

In Greek pieces of money were call'd χηιατα from their use; νεια, νειατα, denoting little pieces of money as fit to exchange greater.

I need not insist upon the use of money in the Commerce and Traffick of mankind, the principal is that of saving the commutation of more bulky Commodities.

Merchandising both by Money and Exchange of Commodities was used in Homer's time. There is a great dispute among the Lawyers, p whether Glauclus his exchanging his golden Armour with the brazen one of Tydides was to be reckon'd emption or commutation.

I shall not trouble the Reader with the different names of pieces of money arising from their different form, weight, quantity, from the Princes, States, Nations, Times, Places and Occasions, under which they were coined.

It may be of more use to mention some of the usual Types or Figures, with which different Nations stamped their Coin.


p Homer. Iliad. 7.

* The
Tables of Ancient Coins,

The Ætolians stamped upon their Coin Hercules with his Club breaking Achilens's horn.

Alexander, Bucephalus or his own Image enthroned, with a Bird in hand, or a winged Victory.

The Argives, a Wolf or a Mouse.
The Aspendii, Palestrinæ, Wrestlers.
Asia, a boy riding on a Dolphin.
Athenians, an Owl with Pallas, likewise an Ox.
Augustus Caesar, the Constellation of Capricorn under which he was born: and on his Copper Money, the figure of Cicero.

Boeotians, a Fly with a Stag: a Cantharus of Bacchus with a Bunch of Grapes.

Brutus, on one side his own image, on the reverse a Pileus or bonnet with two Daggers.

Byzantines, a Dolphin twisted about a Trident.

Cephalenes, a Horse.
Chii, a Harpy, likewise a Homer.
Corcyrians, a Trireme or Gally rowing.
Corinthians, Pegasus with a Neptune sitting and carrying his Trident.
Crotoniæ, the Delphic Tripode.

Cyreniens, Ammon, on the reverse the Silphium, a plant of whole juice the Affa setida is made, whence it is called the Succus Cyreniacus.

Cyziceniæns, a Lyon.
Dardana, two Cocks a fighting.
Demetrius, a Neptune Redux, or come back.
Dymeans, a Goat tearing a Frog.
Eretriens, a Diana.

Hadrian the Emperor, the figure of Justice sitting.
Hebrews, on their Shekel, Aaron's Rod budding, with a Censer smoking.

Hispanis, Neptune on a Whale.

Illyriens, a Boy riding on a Dolphin.

Italians,
Weights and Measures, &c.

Indians, a double-faced Janus with a Ship, likewise an Ox and a Sheep.
Leucadians, a Ship.
Libia, a Ceres agrigera, or reaping.
Locrians, some a Star, some a Grasshopper, others a Pugil.
Lycians, a Lyre with a Goat upon him.
Macedonians, a Hercules's Club, and Goat's Horns.
Myzelemonians, the image of Sappho their Citizen.
Metapontinians, Ceres with an Ear of Corn.
Navians, a bearded Bacchus, and a Satyre with a Cup.
Parians, upon their Drachms an Aratus.

* Persians, an Archer.

* Peloponnesians, a Testudo or a Shell.

Philip of Macedon, Bigas, id est, Chariots with two horses; or his own Bull; on the reverse himself enthroned with a Bird in hand; which reverse his son Alexander took from him.

Phocenses, an Eagle and a Tripode.
Pyrrhus, a Pallas with her Spear enthroned.
Reginians, a Hare and a Chariot.
Samians, a Peacock.

* Seleucus Nicator, an Anchor.
Tarentines, their founder on a Dolphin.

* Tenarians, a Bipennis or Ax, with two Heads of a Man and a Woman averse, a Symbol of the punishment of Adultery.

Thasians, a Perseus; upon their Tetradrachms a Hercules their preserver, and a Bacchus crowned.

Thebans, Hercules's Bipennis, a weapon which we may translate a Poll-Ax.

Thessalians, a Horse.

Trachinians, Hercules sitting.

Trajanians, a Trident, on the reverse a Minerva.

Trojans, Troian a Sow.

Vespasian, a Dolphin and an Anchor.

* Plutarchi in Laconicis.  y Hefych.  = Nico. leonticus lib. 2. cap. 20. de varia historia.
* Stephanus de Urbibus.
Tables of Ancient Coins,

The Romans commonly inscribed the heads of their Emperors. There are many other Stamps. Vide Camerarii historiae rei Nummariae.

The value and weights of the common current Coins the Reader will find in the following parts of this book. There were some very rare Coins struck of a pound weight, both of Gold and Silver, particularly those of Gold which the Emperor Constantine sent to Chilperic King of the Franks. There were but fifty of them, with this Inscription, on one side, TIBERII CONSTANTINII SEMPER AUGUSTI, on the other, GLORIA ROMANORUM.

Heliogabalus the Emperor struck some Gold Coins of two pound weight, which his Successor Alexander Severus ordered to be melted down.

The Ancients were as careful as we to Coin their Money in due weight and fineness, and keep it up to the Standard; only in times of exigence they have done what has been imitated by all Governments, diminished both the weight and fineness, of which more afterwards. There was this difference between their inspection of money and ours, that the care of the Coinage was committed to the inferior Magistrates, and I don’t find that they had a publick trial by a Pix, as we solemnly practice in this Country.

The penalties against adulterating the Coin, tho’ not the fame, were very severe in all Nations. One Diogenes Sinopeus was only banished for it. Among the Egyptians, both the hands were cut off. By the civil law they were thrown to wild beasts; which was founded upon the Cornelian Law, whereby they were to undergo the penalty of Forgery, and the concealer of the Crime was equally guilty. By the fame Law it was provided that none shou’d buy Coin made of Tin or Lead. In False-Coinage Slaves were allow’d to discover their Masters, and they were rewarded with their
Weights and Measures, &c.

their freedom for it at the publick Charge: I suppose that was in the case where they serv'd another, besides their proprietor. a The Emperor Tacitus enacted that counterfeiting Coin should be Capital, with the forfeiture of goods and chattels. It was enacted Treason by the Emperor Constantine, as amongst us.

1 George Agricola reckons seven kinds of false money, too long here to enumerate.

C H A P. III.

Of Roman Coins.

Of the AS or ÆS.

The Romans reckon'd their Money by Æs, Asses, Sestertii or Nummi, Denarii, Solidi or Aurei, Pondo or Libra. Æs, Æris, besides its signification of Money in general, denoted a particular Coin made of that Metal.

a There is mention made of Æs grave, which was paid by weight and not by tale.

Æris in the genitive is used for an adjective, pro Æreis nummis seu Assibus. Mille Æris and Mille Asses signify the same thing, whereof there are numberless Examples.

b This Coin was at first libralis or of a pound weight, and ev'n when it was diminished, retained the name of libella. So Dupondius denoted two Asses. The Emperor Justinian forbade the calling the Students of the Law of one year's standing Dupondii, which name was given them it seems in contempt. b The first impres of this Coin was a Janus geminus, and on the reverse the Rostrum of a Ship.

C

As

a Flav. Vopiscus in ejus vitâ Agric. fine-lib. 1. de pretio metall. 
1 Geor. gentum signatum erat, grave Æs plaufris quidem in Ærarium convenientes, speciosam collationem faciebant.
2 Livy lib. 4. in fine. Et quia nondum ar.
3 Plin. lib. 34. cap. 3.
Tables of Ancient Coins,

As not only signified a piece of money, but any integer, from whence is derived the word ace or Uncia. Thus as signified the whole inheritance. Havre ex As, the Heir of the whole estate. Just so the jugerum or Acre of land being reckoned the integer was divided into 1 2 Uncia as the As, after the manner set down in the Tables.

There is often mention made of the Quadrans and Teruncius as pieces of Coin. The Quadrans is called by Pliny Triuncius: both Quadrans and Teruncius are used to signify the smallest Coin. Only Quadrans was understood to be the fourth part of the As Liberalis, and Teruncius the fourth of a Libella or diminutive As. To be called Quadransaria was the utmost reflection on a Gentlewoman. To this Cicero alludes in his Oration for M. Cælius. Cæcilius the Poet call’d Clytemnestra so. Quadrantilla is the name of a Strumpet in Petronius.

That the Triens or one third of the As was a Coin, is made out from a ridiculous Story in Pliny. The family of the Servilius had a Triens which they fed on festival days with Gold and Silver (proper aliment for a piece of money) and as it threw or decreased, they calculated the fate of the family. Pliny tells you the Story from the relation of an old Slave, one Meffala.

The As was by degrees diminished: from the pound weight (as is told at length by Pliny) it fell to two ounces in the first Punic war, afterwards when Hannibal invaded Italy to one ounce, then by the Papirian law to half an ounce. These alterations were occasioned by the necessities of the commonwealth; but to be sure

\[\text{Plin. lib. 33. cap. 3. Cic. in Orat.: pro M. Cælio. Nisi forte mulier potens quadransaria illa, permutatio familiari, facta est baleatoria. Plin. lib. 33. cap. 13. Unum etiam, quod As miraculum non omissum, Servilius familia illustris in fallis, Trientem Acrem patuit Auro & Argento, conflatum et urumque, et ipso aequo, natura incomperita est mihi, verba ipsa eae re Meffala et servilum. Servilius familia habet Truentem facrum cui summum cum cura & magnificentia sacra quotidni facunt, quem serunt aulas crevisse, alias decretissi videre: & ex eo aut dimissione num aut honorem familiis significari, Ex placuit Denarium pro decem libris As, Quinariae in quo quidcum, Seferitum pro duodecim idem ac similis. Librae autem pondus Asis minime numeri, cum impen-}}

\[\text{—Polites Hannibale urget, Q. Fabio Maximo Dictatore, Asse sanciatae facti: placuit denarium sedecim Asibus permutae-}}

\[\text{—Livius Drusus in Tribunatu plebis odiavam partem Asis Argento usitavit.}
Weights and Measures, &c.

Sure the plenty of Silver and Gold would have done the same thing, and brought down such an enormous Brass Coin.

As amongst the Latines is put for the diminutive of money, non Assis facere, ad Assem omnia perdere.

From As is derived Tressis, Quadresillis, Nonuiffs, Decuiffs, Vigesillis.

Some think that Assidus likewise comes from As, a man intent upon the penny.

Of the Sestertius.

Sestertius is so called, quasi Semisestertius, according to a Greek Figure: for ἐξοδομὸς ἦμιταλανθο, which literally translated signifies a seventh half Talent; yet according to Volusius Matianus, signifies six whole Talents and one half: So a Sestertius which contains 2 Asses and one half, or duos Asses cum tertio semisse, is so called from Semisestertius. * This is affirm'd by Varro; and likewise by b Vitruvius, who saith, Estiam quartam Denarii partem, quod efficiabatur ex duobus Assibus et tertio semisse, Sestertium vocitaverunt. And the same is asserted by c Priscianus. The Sestertius was a Silver Coin, and never of Brass, it was equal to the fourth part of a Denarius, according to Festus Pompeius and the above-quoted Passage of Vitruvius, and several others to be found in Authors. Cicero against Verres speaking of the price of Corn, makes 3 Denarii to be the same with 12 Sestertii.

* Varro lib. 4. de ling. Lat. b Vitruv. flertius, &c.—Dupondius enim & semis, antiqu. lib. 2. cap. 1. c Sestertius oblat dupondius & quos Sestertius est. Semis, id est, duo libras & semis, quasi Semi-
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Of the Nummus.

The Nummus, when mention'd as a piece of money was the same with the Septertius. Cicero against Verres faith, Cogit Scandilium quinque illa millia nummum dare Apronio, and immediately after adds, Cogit Scandilium Apronio H. S. quinque millia mercedis nomine ac premii dare. Where it appears that 5000 Nummi are put for 5000 H. S. or Septertii. 

So Pliny and Varro speaking of the gain arising from the fattening of Peacocks, the former calls it 60000 Septertii, and the latter 60000 Nummi.

Besides Septertius and Nummus are frequently join'd by Authors, and then signify the same that either doth separately. This is plain from Columella, Valerius Maximus and others. So Mille Nummi, Mille Septertii, and Mille Septertii Nummi signify the same; as do likewise Mille Nummum, Mille Septertium, and Mille Septertium Numnum.

The Greek Computations proceed upon the same Supposition, the Denarius and the Drachma being reckon'd equal. Plutarch in Sylla faith that 1000 Nummi was equal to 250 Drachma, consequently one Drachm is equal to four Nummi. Aristotle faith that a Nummus was equal to 3 Semioboli, which make the fourth part of a Drachm. Plutarch faith that Caesar left by will to every Citizen 75 Attick Drachms, and Suetonius faith he left to each of them 300 Nummi.

Septertium in the neutral gender signifies Mille Septertium Nummorum. It is a great dispute among Authors whether they are the same word. Some are of opinion that as a Septertium signified two pounds and a half of Brass, according to the weight of the first Asses; so Septertium signified two pounds and a half of Silver, which seems to be but a groundless imagination; and Gronovius

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* Plin. lib. 10. cap. 20.  
* Varro lib. 3. apud Polluceum lib. 9.  
* apud Rufica.  
* Colum. lib. 1. & 3.  
* Valeri. Max. lib. 5. cap. 2.  
* Aristotle.
Weights and Measures, &c.

is certainly in the right, who takes Sestertium in the genitive, and when they say Mille Sestertium, the substantive Corpora is understood. Let the Grammatical reason of the Phraseology be as it will, it is certain that Sestertium signifies Mille Sestertii Nummi. The Marks of the Sestertius Nummus are IIS. LLS. H.S. H-S. which Characters denote 2 ¼ Asses. Budaus faith he hath observed that the millenary Sestertium in good Manuscripts is marked with a line cross the top thus HS.

The Reader must still remember that

\[
\begin{align*}
\text{Mille Sestertii,} \\
\text{Mille Nummi,} \\
\text{Mille H S;} \\
\text{H-S;} \\
\text{Mille Sestertium,} \\
\text{Mille Numnum,} \\
\text{Mille Sestertii Nummi,} \\
\text{Mille H S. Numnum,} \\
\text{Æris 2500,} \\
\text{Denarii 250,} \\
\text{Drachma 250,}
\end{align*}
\]

denote the same Sum, viz. according to the Tables 8 l. 1 s. 5 ¼ d.

He must likewise observe that in speaking of Sums above a thousand, there is often a double Eclipis, sometimes of the word Sestertium or its mark, sometimes of the word Mille. In the first and second of those Epigrams at the bottom of the page † H S or Sestertium is understood. In the others Millia. There is another double Eclipis to be observ’d, when they use the numeral Adverbs they leave out Centena Millia. Thus Cicero in 3 Verrina. HS bis tricies in singulos annos Verri decernebatur, quod avatoribus solvere.

† Pauca Jovem nuper cum millia forte rogam. Septingenta Tito debet Lupus—
Martial. lib. 6. Quadringenta tibi non sunt, Cherefrate.
Quid promittebas mihi millia Gaure ducenta surge.
Si dare non poteras millia Gaure decem.
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ret. Centena Millia is understood. So that the Sum in Cyphers
must be thus expressed: 320000 Nummi Sestertii, or 3200 Sestertia; a Sestertium being equal to 1000 Nummi Sestertii. This is
clearly enough expressed in the Tables. If the Sum is to be re-
duced to Nummi Sestertii, then centum and mille both are under-
stood, and that Decies or 10 must be multiplied by 100000.
If you would reduce the Sum to Sestertia, the word centum being
then understood, it must be multiplied only by 100: Thus De-
cies HS is 100000 Nummi Sestertii, or 100 Sestertia. So
that Decies centena millia HS, or Decies without HS. (Decies apud
Plutarchum in Antonio) æris vicies quinuques, denariorum 250000,
Drachmarum 250000, are to be found in different Authors and
express the same Sum, viz. 8072 l. 18 s. 4 d. But

Mille Sestertii,
Mille Sestertia,
Millies HS Sestertium

express very different Sums.

Mille Sestertii is only 1000 Nummi Sestertii, in English money
8 l. 1 s. 5½ d. which makes a Sestertium.

Mille Sestertia is 1000 times that Sum, viz. 8072 l. 18 s. 4 d.
But millies HS, is 100000 times that Sum, or 807291 l. 13 s. 4 d.

When the numbers have a line over them, Centena Millia is un-
derstood, as in the case of the numeral Adverbs; thus HS. MC
signifies the same with Millies Centes HS, that is, 110,000,000
Nummi, or 888020 l. 16 s. 8 d. whereas HS. MC. without
the Cross Line denotes only 1100 Nummi, or 8 l. 17 s. 7½ d.

When the numbers are distinguished by points in two or
three different orders, the first towards the right hand signi-
fies Units, the second thousands, and the third hundred thou-
lands: for instance III. XII. DC. HS. denotes 30000, 1200,
and 600 HS, in all making 312600 Nummi, or in English mo-
ney 5047 l. 3 s. 9 d. Pliny faith that seven years before the third
Punic war, there was in the Roman Treasury Auri Pondo XVI.

DCCCCX,
Weights and Measures, &c.

DCCXX, Argenti Pondo XX. LXX. & in numerato LXII. LXXV. CCC. which is to be thus interpreted, 16810 Pounds of Gold, 22070 Pounds of Silver, and in ready money 6275400 Nummi, or 50741 l. 105. 2½d.

I know by experience that those Expressions in ancient Authors create a confusion in the minds of the Readers, and that they have no notions of the numbers, in reading the Authors. Therefore I hope to be excused in being a little particular on this Subject.

Of the Denarius.

The Denarius was the chief Silver Coin among the Romans. As a weight it was the seventh part of a Roman Ounce. It is from this Standard that both the value of the Roman Weights and Coins in the Tables are deduced. In the setting of which I have follow'd Mr. Greaves, who may be justly reckoned a Classical Author on this Subject.

That industrious, learned, and honest person affirms that having in Italy and elsewhere perused many hundred Denarii Consulares, he found by frequent and exact Tryal the best of them to amount to 62 Grains English, such as he had carefully taken from the Standards of the Troy or Silver Weights kept in the Tower of London, and in Goldsmiths-Hall, and in the University of Oxford. He arrives very near at the same conclusion by two Experiments that were made of the weight of water contained in the Congius of Vespuwan, which was 16 Roman Pounds. One Experiment was made by Villapandus on the Congius it self, and the other by Gajsendus upon a model. By the first of these experiments the weight of the Denarius or the seventh part of a Roman Ounce comes out 62½ Grains; by the second 62¼: neglecting the Fraction, he has stated the value 62 Grains, or 7 pence 3 farthings English, allowing 8 English Grains to the Silver Penny. This valuation I have follow'd.
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follow'd in the Computation of Sums, viz. supposing Silver at 5 Shillings the Ounce, which although not exactly true, (for by the present Standard of the Coinage, 62 Shillings, or 3 Pound 2 Shillings, is coined out of one pound weight of Silver.) since we don’t know the fineness of the Roman money, may be a Supposition as good as any other, and prevent some trouble in computation.

The Roman Ounce is certainly our Averdupois Ounce, but I must own that I have differ’d in a small matter from Mr. Greaves in settling the quantity of Troy Grains contained in an Ounce Averdupois; for supposing the Averdupois Pound to be to the Troy Pound as 175 to 144, and consisting of 16 Ounces, makes the Roman or Averdupois Ounce to be 437 ¾ Troy Grains, and the Roman Pound 5250 Grains. The proportion that was given me as a true one, was 17 to 14, neglecting the last Figures, and consequently the proportion of the Roman or Averdupois Ounce to the Troy Ounce is precisely as 51:56, and by this the Roman pound according to my Tables will consist of 5245 ¾ Grains Troy, which is 47 Grains less in the Pound, and if it be a mistake is a very inconsiderable one. The Denarius according to my supposition will come out 62 ¾ Grains: the fraction is not to be neglected in reckoning the Pound. This makes it highly probable that the Romans left their Ounce in Britain which is now our Averdupois Ounce: for our Troy Ounce we had elsewhere.

That the Denarius was the 7th part of the Roman Ounce, is clear from multitudes of passages. Celsus lib. 5. cap. 17. Sed & antea scire volo in uncia pondus denariorum esse septem.

Another way that Mr. Greaves made use of to find the weight of the Denarii, was by the weight of Greek Coins, especially Attick Tetradrachms, for the Denarius was always reckon’d equal to the Drachm; but those experiments bring out the Denarius heavier: for weighing many Attick Tetradrachms with the image of Pallas on the forepart, and of the Nothua on the Reverse, he found the best of those to be 268 Grains, that is each particular Drachma 67 Grains, and from the Golden Didrachms
Weights and Measures, &c.

Didrachms much the same. He mentions one from Snellius that weighed 134½ of our Troy Grains, which makes it 67½. That the ancient Roman Denarius and Attick Drachma were reckoned equal, appears partly from what has been observed before; and further from the Testimony of Pliny, who lived from the time of Vespasian to that of Trajan, who affirms expressly that the Drachma Attica had the weight of the Silver Denarius. Cleopatra affirms that the Italick Denarius was one Drachm. Cicero naming the Donative of Octavius to the veteran Soldiers, calls it 500 Denarii, and Dion calls the same 500 Drachms. Galen's faith that by a Drachm is meant the same weight the Romans call a Denarius. This is plain from an interpretation of Anius Gellius. Plutarch computes the Sums which the Romans express by Septertia in Drachms at 4 Septertia to the Drachm, viz. the number of Septertia in the Denarius. Strabo faith that in the Siege of Catilina a mouse was sold for 200 Drachms, this Valerius Maximus translates 200 Denarii. Athenæus faith that 400 Attick Talents make 240 myriads of Denaroi, that is, 2,400,000 Denaroi, = 400 Talents, or one Talent = 6000 Denaroi, the number of Attick Drachms in a Talent. Pompilius Pompilius faith in express Terms that an Attick Talent contains 6000 Denaroi. The same appears by comparing Livy with Polybius. I have been the more copious in quotations upon this Subject to shew the general consent of Authors of all ages and times in the equality of value of the Attick Drachm and Roman Denarius. And it would bring in a great confusion to change that way of reckoning, but then the difficulty is how to preserve the equality between two Coins which appear so different in weight, as 62 and 67 Grains.
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I shall in the first place give you Greaves's Solution of this Difficulty, in his own words, viz. "First that the Denarius and Attick Drachm being distinct Coins of different States, and not much unequal in the true weight, it is no wonder, especially in Italy and in the Roman Dominions, that they should pass one for another: No more than that the Spanisb Rials in our Seas-Towns in England, should pass for Testars; or the quarter of the Dolar be exchanged for our Shillings: whereas the Rial in the intrinsical valuation, is better than our Testar by four grains, and somewhat more; and the quarter of the Dolar is better than our Shilling by more than eight Grains, or a penny; but because they want the Valuation, Character and Impression of our Princes, which I call the Extrinsic of Coins, therefore doth the Spanisb money fall from its true value with us, and so would ours do in Spain. By the same Analogy must we conceive the Attick Drachms, tho' in the intrinsick they were somewhat bet-ter worth than the Denarius. And this seems to be implied by Volusi Marianus: Victorius nunc tantundem valet, quantum quin-narius olim. At peregrinus nummus loco mercis, ut nume Tetradrachmum & Drachma habeatur. Which words of his, loco mercis, plainly shew they made some gain of the Tetradrachmum and Drachma: As our Merchants and Goldsmiths do of the Spanisb Rials, and quarters of a Dolar, which they could not if they were precisely equal, but must rather be losers in the melting or new coinage of them. And therefore all modern Writers that have treated of this Argument, some of them making the Drachma less than the Denarius, others equal, but none greater, have been deceived by a double Paralogism, in standing too nicely upon the bare words of the Ancients, without carefully examining the things themselves: First in making the Denarius and Attick Drachm precisely equal, because all ancient Authors generally express the Attick Drachm by the Denarius, or the Denarius by the Drachm: either because in ordinary Commerce and vulgar estimation, they passed one for another, in the Roman State;
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State; or else if any were to curious to observe their difference, as surely the Kolvusiai were, yet by reason of their nearness, and to avoid fractions, and having no other names of Coins that were precisely equal, whereby to render them, therefore all Greek and Latin Authors mutually used one for the other. And secondly because some Writers (as Dioscorides and Cleopatra) affirm that the Roman Ounce contained eight Drachms, therefore modern Authors infer, that the Denarius being equal to the Drachm, and eight Drachms being in the Roman Ounce (as so many were in the Attick) that therefore there are eight Denarii in the Roman, and consequently that the Roman and Attick Ounces are equal. Whereas Celsus, Scribonius Largus, and Pliny, as we shewed before, expressly write that the Roman Ounce contain'd in their time, (which was after Dioscorides,) seven Denarii. And being natural Romans, and purposely mentioning the proportion of the Denarius to the Ounce, thereby the better to regulate their Dosæ in Physick, it is not probable but they must better have known it than the Grecians." But I am afraid this Solution will not be sufficient to answer about 5 per Cent. difference in the value of the Coins. If an Attick Drachm of 67 Grains pass'd for a Roman Denarius of 62, the Exchange was very much on the Roman Side.

The following Tables were publish'd before the learned Bishop Hooper's ingenious Enquiry into the State of ancient Measures appeared, which has given a great many new lights in this intricate Subject, and perhaps what he suggests may be an answer to this difficulty: his words are as follows, page 44. "So is the proportion, as well of the Attick Weight, as of their Coin well known: But the value of each piece not so well ascertained as one could wish. For the Drachma, from whence all their money is best estimated, and which is also the principal weight, is very differently stated. Our accurate Mr. Greaves upon the weighing of many Attick Tetradrachms, found some, the best he saith, of 268 Grains, which give 67 for the Drachma: And examin-
ing the golden Didrachms coined after the Example of the old
"Darics, by Philip and Alexander, as he mentions one of each
from Smebullus, which weighed 1, 4, 5 of our Grains; so he spe-
cifics three of Alexander's, which he had seen, that wanted but
half a Grain of 1, 4, or twice 6, 7 Grains. Such too Dr. Ber-
nard met with; but more commonly with those of 6, 6 to the
"Drachma. The generality of elder Coins that remain give it at 6, 5
"Grains: Some Arabian Physicians at 6, 4, 8. And it is cer-
tain, as we shall see hereafter, that in the time of the first Ro-
man Emperors it came to be under 6, 3 Grains: and not very
long afterwards to be under 5, 5, and so to be; of a Roman Ounce.
"Thus did the money Drachma in process of time decrease; as is
found by the Tryal of a Balance; and will appear by the testi-
mony of old Authors, comparing them with the Roman Weight
and Money. But all the while we may suppose the ponderal
"Drachma to have continued the same, just as it has happened to
us, as well as our neighbours, whose ponderal Libra remains as
it was, tho' the Nummary hath much decreased.

And page 55. "This gradual decrease, the succeeding Coins
of the several Ages shew us. And it may be convenient there-
fore, for the Reduction of their money to ours, to form diffe-
rent Tables for them: The one, for example, after Solon's Stan-
dard: which may serve, with some little allowance, 'till the days
"of Alexander: Another more suited to the times that follow'd,
"unto the Subjection of the Greeks to the Romans; and at the
"rate of 6, 5 Grains or thereabouts to the Drachma: and a third
"of 6, 2, 5; which was equal, as we shall find, to the Denarius of
"that weight under the first Roman Emperors; and had been equal,
"as I shall suppose, for some considerable time before.

Of this we shall speak more fully afterwards.

Mr. Greaves is of opinion that the alteration mention'd by Pliny
in that forecited passage, lib. 30. cap. 3. of the Denarius being or-
dered to pass for 16 instead of 10 Asses, continued from the first
institution of it in the second Punic war, without any interrup-

"
Weights and Measures, &c.

tion to Justinian's time: but this opinion is contrary to the whole Classical Style; in which a Denarius, 4 Nummi Sestertii, and 10 Asses are terms equivalent, and denote the same Sums: to change that way of reckoning, would be to introduce nothing but confusion: it is not credible that the Writers expressed the valuation of the Denarius according to its first institution, without regard to the present valuation.

He is surprised at the strange and unadvised proportion between the Brass and Silver Monies of the first times, that X Pounds of Brass should be but answerable to the 84th part (for so much or near it was the Denarius) of a pound of Silver; or to speak more clearly that one pound of Silver should be equal in valuation to 840 pounds of Brass.

I am of opinion that tho' Pliny gives you the true matter of fact, he assigns a false reason for it; for he seems to attribute the cause of the diminution of the weight of the Asses to the necessities of the Commonwealth, whereas it was undoubtedly the change of the Balance of the two Metals of Brass and Silver: and for that reason the Commonwealth gradually reduced the weight of their Asses, finding the former proportions too high.

Another method which Mr. Greaves takes to determine the weight of the Denarius, and the gradual diminution of it, is by the weight of several Aurei, it being probable that as the Athenians made their σεβεστής or Aurei double in weight to the silver Drachma, so in imitation of them the Romans made their Aureus double in weight to the Denarius: from whence it is concluded that the Aureus Romanus falling in its weight, the Denarius likewise of necessity must fall. In what manner the Aureus was first coined, and how afterwards it lost of its primitive weight, Pliny informs us lib. 33. cap. 3. Aureus nummus post annum LXII percussus est quam Argenteus, ita ut scorupulum valeret Sestertiis vicenis, quod efficit in libras ratione Sestertiorum, qui tunc erant, Sestetios CCCCC. Post hae placuit XL. M signari ex auri libris: paulatimque principes immittueron pondus, immittisse vero ad XLV. M. This
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This passage is corrected by Greaves after the following manner, Postea placuit X. XL fignari ex auri libris, paulatimque Principes imminuere pondus, imminuisse vero ad XLVIII.

It is to be observ'd that Pliny, who mentions the diminution of the weight of the Aurei so nicely as to specify the exact proportions, faith nothing of the diminution of the weight of the Denarius, I therefore think it is not perfectly evident that the Denarius kept pace with it, although it is generally agreed that the Denarius fell from \( \frac{1}{12} \) of an Ounce; and the accurate Bishop of Bath and Wells has made two different Tables for the Reduction of them to our Standard. But the Denarius of the Classical Authors, which is allow'd to be the 7th part of an Ounce, is made use of in the following computations of the Roman money.

The Subdivisions of the Denarius \(^a\) were the Quinarius or half Denarius, so called from its value of five Asses, \(^b\) the half Denarius was likewise called Victorius.

\(^c\) Celsus divided the Denarius into 6 parts, which he called Unciae; Uncia being a general word, as we said before, for the division of any Integer. This was done in imitation of the Greek Physicians, who after the manner of their Country divided their Drachma into 6 Oboli.

\(^d\) The Stamp of the Denarius was the image of the Consul or Prince under whom it was coined, which is plain from those now extant, and passages of Authors.

The inscription commonly express'd the name of the Prince and the occasion of the coining of it. The Reader may see as an example, in the quotations below, an Inscription of a Denarius of Antoninus Pius.

The common mark of the Denarius was an \( X \) or \( \overline{X} \) in imitation of which among the Latin Physicians it grew to an \( * \). The Greeks used the word \( \\
\begin{array}{l}
\text{Varrone lib. 4. de lingua lat. In argento nummii Denariorum denos Aesis valebant, \\
\text{Vopulio Metiani.}
\end{array}
\begin{array}{l}
\text{Corn., Celsus lib. 5. cap. 17. D Plin. lib. 6 cap. 10. Matth. 23. Marci 12. Lucae 20. In una parte ANTONINUS PIUS, AUG.}
\end{array}
\begin{array}{l}
\text{BRIT: in altera vero facie AUGUSTUS BRITANICUS, PONTIFEX MAXIMUS, TRIBUNICIA POTESTATIS DUODECIMUM, CONSUL TERTIUM.}
\end{array}
Weights and Measures, &c.

*Tully has the expression ad Denarium solvere, which Hobius justly blames two Authors for misinterpreting, one understanding it as if it were, ad minimum solvere, to pay to the last farthing, the other explaining it of Interest, whereas the true meaning is to pay in Roman money.

There is mention made of *Bigati and *Quadrigati, which were Denarii so called from the Stamps of Biga and Quadrige upon the Coins.

†Cornelius Tacitus mentions Nummi Serrati, perhaps from the figure of a Saw upon them: what they were is uncertain.

*There are likewise mentioned by Authors Argentei, and *Argentei minuti, and ærei Phillipiæ. Those were in the later times of the Empire and of uncertain value.

Of the Roman Pondó.

The Pondó Argenti amongst the Romans is a sort of numeral expression of Sums of Money, and is different from the common Libra, which consisted only of 84 Denarii or 96 Drachms: for As, Æs, Pondó and Mina amongst ancient Authors generally pass for the same. Budeus reckons this Pondó to consist of 100 Denarii, and George Agricola of 96, supposing the Denarius and the Drachma to be equal; according to Budeus’s valuation, the Pondó amounts to the value of an Attick Mina or 3 l. 4 s. 7 d. According to Agricola to 3 l. 2 s. 0 d.

It is very probable that the Romans made use of this Decimal Pondó, or Libra, in imitation of the Greek Mina. For what Livy *expresseth by Argenti Pondó bina & felibras, Plutarch *renders 250 Drachms.

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*e Cicero Orat. pro Quint.  †Livy. lib. 6. Decad. 4.  ‡Plin. lib. 33. cap. 3.  §Corn. Tacit. German. Pecuniam probant veterem Serrato & Bigaros.  †Cic. Spartianus & Bigaros.  ‡Lamprid. in Heliogabalus.  †k Spartianus in Aurelinio.  §Spart. in Probo.  †m Liv. lib. 2. Decad. 3. Convenerat inter Duces Romanum Penumque, ut quae pars pluris recipere, quam dare, argento pondo bina & felibras in mitiem pristaret.  ‡Plutarch in Fabio Max. ἔσχετε τοις τῶν αὐτὸς, ἅπαξ μὲν αὐτοὶ τὸ δόξον ἐπέφεραν, οἱ δὲ πλεῖοι, οἱ δὲ τρίοι τινὲς ὑμᾶς ἄριστον ἔπεμψαν τῷ κυρίου τέκναν τῆς τυχερίας κυνηγοῦντο καὶ θράσει.
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Galen in his Book de Compositione Medicamentorum tells us that some reckon'd 100 Drachma to the Libra. However it is certain that sometimes Libra applied to Sums of money, denotes only the Roman Pound of 96 Roman Drachms. Here it must be considered that when in the Tables Silver is reckon'd at 5 Shillings per Ounce, it must be understood of Silver coin'd nearly according to the English Standard, which has 18 pennyweight of Alloy in the Pound Troy. Now if to a Roman Pound of pure Silver you add Alloy in the proportion of the English Coinage, it will make in value only 2l. 19s. 1d. But in the common acception of Authors the nummary Pondo is the same with Mina, and makes as we said before 3l. 4s. 7d. We are not perfectly sure of the Standard of the Roman Coin; and weight alone is not sufficient to determine the value to great preciseness. It has been in some instances very course. Pliny tells that Livius Drusus in his Tribunate mixt 4 of Brass with it. Pondo is an indeclinable word, and when it is joined with numbers it signifies Libra; when it is join'd to other weights, it stands for the same things as σαλβι or όλυν in the Greek, signifying the same with Pondus or weight in general.

The Romans made use of the word Talentum or Talent in Grecian affairs.

Weights and Measures, &c.

C H A P. IV.

Of the Græcian Coins.

The Greeks made use of Drachmae in reckoning Sums either in their own or Roman affairs: as the Romans did of Nummi Sestertii: of which there are many Examples in all Authors, especially in Plutarch.

* A Drachm is the hundredth part of a Mina.

† Δραχμὴ quasi δηραχμὴ is a thing taken or apprehended by the hand, δεξιάλομα, or as you would say a handful of six Oboli, which are equal in value to it.

It is a Weight as well as a Coin. The Attick Drachm is commonly reputed equal in value to the Denarius. And as amongst the Romans the Denarius, so amongst the Greeks the Drachma was coin'd both of Silver and Gold. But in reckoning Sums, where it is not otherwise specified, the Silver Coin is understood.

The value of which we have stated in the Tables and in all the following computations to be the same with the Denarius, viz. 7 ¼ d. We before observed that the learned Bishop Hooper makes the value of the Attick Drachma different in different ages, and the highest according to the weight of the Standard Mina of Solon 68, 4 Grains; but he owns that it fell afterwards to about the value of 62, 57; which is much the same with that in the Tables. And upon this Drachma, and the equality of it to the Roman Denarius, almost all the computations in Classical Authors are founded, which we did not think worth the while to change, or

* Plutarch. in Solone ἐκατον ὦ ἐτοιμεί δραχμα μὲν τῷ μίῳ. & Jul. Poll. in Eupolide. ἦ δραχμὴ ἑκατά μὲν ἐκεῖ δραχμῶν ἐκατον. † Eustath. in Iliad. ἦ δραχμα ἡ (λίγης) σιδηρῆς τι ἀλαμματικὴν κόλαμ βις πώς ἵκεν ὡβολόν, ἐ μίῳ σαί ἐ ἐκ τῆς ὀξύλαγυρος. ἦ δραχμὴ ἐκ τῆς παχύτητι ὧν ὑπεδεδήξε ἔτραχμα, ὑπεδεδήξε τοῖται ἐξ αὐτοῦ ὡβολοῦ ἐκ Ἰουνίων ἔρισεν χείρ.
Tables of Ancient Coins.

or diversify in a few instances that may be in earlier times. But if this Supposition be true, and the Reader of ancient Authors is resolved to be nice, the value of the several Drachmas, according to the Bishop's Supposition, from 70 Grains downwards is as follows.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 gr.</td>
<td>9 d.</td>
</tr>
<tr>
<td>70</td>
<td>8 3</td>
</tr>
<tr>
<td>68,4</td>
<td>8 2;</td>
</tr>
<tr>
<td>65,5</td>
<td>8 0;</td>
</tr>
<tr>
<td>62,97</td>
<td>7 3;</td>
</tr>
</tbody>
</table>

*The Drachma was divided into 18 xekatw or Sibique as well as into 6 Oboli.

There were different Drachms in different Countries.

*The Drachma Aeginae is commonly reckon'd to be equal to 1 1/4 of an Attick Drachm or 10 Attick Oboli. The Athenians called it παχέαω or thick. *It was the pay of a Horseman even amongst the Athenians. There is frequent mention made of it in Hippocrates.

*There is mention likewise made of the Corinthian Drachm, but its value is uncertain: it is suppos'd by some Authors equal to the Attick.

*The Egyptian Drachm according to Cleopatra was equal to an Obolus or the 6th part of the Attick Drachm.

There were coin'd likewise the Parts and Multiples of a Drachma, the Semidrachma, Didrachmum, Tridrachmum, and Tetradrachmum, which was called the Παλαβί or Owl, likewise *Pentadrachmum, and *Hexadrachmum. In some Authors you find the word

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*Hesychius.

*Julius Pol. lib. 26. 32αλαξαίαν ἡγείμαν δραχμαῖς μείζον, ἀλλὰ δραχμαῖς (ὅποι οὖν δραχμαῖς ἐγγενεῖς) ἕν ἐς ἄθροις ταχείᾳ:

*Thucyd. Hist. 5. 2 Thucyd. Hist. 1. ἐν τῷ τῷ πεποίημες μὲ μὲ ἀθόλοις ἔμπορίας, μετίχρον ἐπὶ πεποίημαι ἀντικρίσεως, οὐδέποτε ἐπείτα ἀποθεοῦσα καταβιβάζοντες προς τας Cleopatra. Συμφῆσαν τῷ ἔλλοιμοι καλύτεραι συμφητείαι, καθὼς ἐντός καθαρεύεσθαι τοῦ γαλακτοῦ.

*Numisma Gynaeorum apud Polluxam.

*Hesychius, & Aristobul: Historie lib. 32. Oeconomic.
Weights and Measures, &c.

Pentacentadrachmum, or 50 Drachms, which if it were a Silver Coin, must have been very large.

When the word δέκα is join'd with a number, it is to be understood of Drachms.

There is mention made of βός, Bos, the Ox, so called from the Stamp; it is reputed equal to the Dirachmum, and was coin'd both of Gold and Silver. This Coin was perhaps one of the ancientest of all in Greece; it is mention'd by Julius Pollux and several other Authors, who say it was known to Homer, and he is thought to allude to it, when he speaks of Glaucus exchanging his Golden Armour, that were worth 100 Oxen, for the Brass one of Diomedes: from whence it would follow that this Armour must not have been entirely of Gold, because a βός being only a Dirachmum, as Pollux affirms, and is likewise plain from Aristophanes; the Armour according to this way of reckoning was worth a very small Sum.

Obolus, Obolus, so called from the form of a Spit, because it was coined in an oblong shape.

There are mentioned the Semioboli, the Dioboli, the Trioboli and Tetraoboli.

Xalcos a small Brass Coin, the 6th part of an Obolus, Dichalcus the third part of an Obolus.

There is even mention'd the Απολόγ, the seventh part of an Obolus.

The Στατήρ, so called from weighing. Stater as a weight signifies a pound. They were coin'd both of Silver and Gold, but most commonly of the latter. They were of different Weights and Names, according to the different Princes and Countries who coin'd them, as

Philippick, Alexandrian Daricks, some were Dirachmi, others Tetradrachmi.

The
Tables of Ancient Coins.

The following Coins are likewise mentioned in Authors.

1. Kórn, the Maid, so called from the figure of Pallas, equal in value to a Tetradrachm.
2. Xeλόω, the Shell, so called from the Type, of uncertain value.
3. Συμβολον, Symbolum, a small Coin of uncertain value.
4. Λέπις, so called from its smallness, it was equal to 1/4 of the Ceratium, which was 1/9 of the Obolus.
5. Ευθεία, a Semidrachma, or Triobolus.
6. Κιδαβος, 1/9 of an Euthenia.
7. Κεραταλλος, Craterallus, equal to 8 Eutheniae, consequently equal to a Tetradrachm.
8. Τεοφίλω, Trachseium, with a Pallas on one side and a Tridens on the reverse; it was of uncertain value.
9. Κόλλαβος, supposed equal to the Roman Sextertius.
10. Κόλλαβον, a small Coin of uncertain value.
11. Κολυμβημ, Columbum, of uncertain value:
12. Κέρατον signifying a small Coin fit to exchange a greater, from whence κερατίζων to exchange Money.
13. Φολλάς, a sort of an Obolus.
14. Δεμαρέτων, so called from Demareta the wife of Gelon.
15. Λίττα, which signifies Libra, a pound weight, is likewise a name for a small Coin equal to an Αιγίναιαν Obolus.
16. There is likewise mention made of Ουζία, or the Uncia, which the Sicilians borrowed from the Roman Libra.
17. Κόδογλυς, quadrans, or the fourth part of an Obolus.
18. Γεβί, a small piece of Coin used proverbially.
19. Ανάγον, used for the As, and sometimes for the Obolus.
20. Πέλανθος, equal to 4 Chalei.
Weights and Measures, &c.

"Oboxai, Crobian Obol.
"Nymia, from Nummus, interpreted likewise Oboì.
"Melissa, Melida, an Obolus.

The vast number of small Governments in Greece occasioned a great variety of names of Coins.

The Mina Attica of Silver.

MNA, Mina Attica, contain'd 100 Drachmæ or Denarii, and the Tables proceed on that principle in reckoning Sums of Money, where a Mina is made 3 l. 4 s. 7 d.

Thus Dionsius Halicarnasseus in reckoning up the Roman census makes the several Classes stand thus:

Fifth, Mina XII. cum semis, or Aëris XII. millia cum semiss.
Fourth, Mina XXV. — — — Aëris XXV. millia
Third, Mina L. — — — Aëris L. millia
Second, Mina LXXV. — — — Aëris LXXV. millia
First, Mina C. — — — Aëris C. Millia.

In the fifth census he differs from Livy, who makes it XI millia Aëris, which is some mistake or false reading; for in the rest they are exactly the same, making the Mina equal to 100 Denarii or 1000 Ases: for it was equal to so much of Roman money, as appears by comparing two passages, one of Appianus and another of Suetonius. For, speaking of a Conqu restarted given by Caesar, the former calls it a Mina, and the other calls it quadringenos Sextertios, which is equal to 1000 Ases, or 100 Denarii.

The old Attick Mina at first contain'd 75 Drachmæ, but afterwards Solon augmented it to 100; as Plutarch relates. And besides him

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\* Hevichins έλλακτι. \* Idem. \* Sueton. in Casare. \* Plutarch. in Solone.
\* Idem. \* Idem. \* Ελλακτι. \* μεγεῖ. \* Επακτην. \* οίκημα. \* Συμμετοχα. \* τρικτός. \* But Agricola in-
\* Plutarch in Solone έκτειν ὑπό οίκημα έτοιμα συμμετοχα. \* Αππιανν. lib. 2. Bell. Civil. \* read of text reads προς.
Tables of Ancient Coins.

him *Pollux, Suidas and *Hippocrates affirm that the Mina Solonis was equal to 100 Drachmes.

*The Mina Attica was the 60th part of the lesser Attick Talents.

Of some Asiatick and Barbarian Coins.

Κ ίσοφόγος, Cistophorus, was a Rhodian Coin, so called from the Stamp of a Κιστα upon it. Festus Pompeius faith that 7500 of them was equal to 400 Denarii; consequently, a Denarius being 7 d. a, Cistophorus must be about 4 d.

This Coin is mention’d both by *Livy and *Cicero.

Ιάλυσιος, so called from Ialyssium, a City in Rhodes. This Coin is mentioned by Hesychius.

*Τενέδιον νόμισμα, so called from the Island Tenedos. On one side of it there was an Αξ, and on the reverse two heads on one Neck. For there was a certain King of Tenedos who made a Law that Adulterers should be beheaded, both the man and woman. It happening afterwards that his own Son was found to be guilty of Adultery, the Law was put in execution against him; and after he was beheaded, the Αξ of Tenedos was used as a pro-verb to denote cruelty. And in memory of the death of this person, the formentioned Stamp was put on the Coin.

*Ομήρος, a Coin of the Smyrneans, so called from Homer whom they claim to be their Countryman.

Τύριον νόμισμα, of the value of a Tetradrachm, is mentioned by Suidas and *Josephus.

Σίγλος is mentioned by Hesychius, and reckon’d by him, in one place worth 8 Attick Oboli, in another, worth 2 Drachms; and by

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Weights and Measures, &c.

by Xenophon it is said to be worth 7⁄4 Attick Oboli. It was a Persian Coin. There were likewise Egyptian øyûla of 16 Attick Drachms value: which Coins seem to have had their name from the Shekel of the Jews.

Δανακον νόμισμα or Δανακί, a Persian Money mentioned by Pollux.

Δανακί, a piece of money given to the dead to pay their freight over Acheron.

Δανακί, a money of the Barbarians worth somewhat more than an Obolus. This was said also to be given to the dead: Lucian in his Dialogues says that in his Time an Obolus was the common fare for Charon, but in Aristophanes he asks two Oboles.

"Υλλαγη is mentioned by Pollux as a piece of money.

Suidas speaks of a Cyrenian Coin, which had on one side Hammon, and on the other the Silphium a sort of Herb. From which the Succus Cyreniacus was expressed.

Χιρε is mentioned by Thucydides either as a Coin or Sum of Money, supposed to be so called from Chios.

Πτολεμαίακοι, so called from Ptolemy.

Βεσσαρίων νόμισμα, so called from Queen Berenice that coin'd it. These two Coins are mentioned by Pollux.

Αμονικών νόμισμα, mentioned by Hesychius, so called from Amon, who was made Governor of Egypt by Cambyses the Son of Cyrus.

Καστιχιον, likewise called Cerseus, an Egyptian Coin spoken of by Hesychius.

Σύμβατον νόμισμα mentioned by Hesychius.

Σεπαί a certain Coin mention'd by the same.

Φιλισίδιον νόμισμα, likewise spoken of by him.

Κέρκεα is said by Hesychius to be an Asiatic Coin.

Διγενώρ
Tables of Ancient Coins,

Δύεκανων και δύεκανων νόμισμα, as the name imports, had two heads like the Roman Coin with a Janus bifrons, and that of Teneus formerly mention’d.

'Επίχυρων, a Coin said by Hesychius to be made of Silver or Lead.

Χαλκοί, an Egyptian Coin of the weight of a Drachma, both Silver and Gold.

Θασίως, a Coin weighing four Drachma.

Κένσος was either a Coin, or a certain Sum of Money.

'Ημαθίον, a Cyzicenian Coin mention’d by Hesychius.

Of the Talent.

Ταλαντος, or Talentum, has a great many Significations. In Homer it commonly signifies a Balance: and therefore the Grammarians derive it from τλῆναι, ἀπὸ τοῦ τλῆναι τὸ βάρος, because it supports a weight: from hence comes ταλαντέω, ταλαντέω, ταλαντέω, which signify to hang or weigh.

The Romans borrowed the word Talentum from the Greeks, but they seldom used it, except when they spoke of Gracian or Asiatic affairs; and when they had occasion to translate Greek Authors. Terence and Plautus who took their fables from those Writers, use it commonly.

Ταλαντος (saith Pollux lib. 9.) μέγιστον ἐσι χειρῶν ἐκ αγνοίᾳ μέρος. And Epiphanius lib. 1. defines it so: ταλαντόν ἐστιν ὑπερβαλλον πᾶν σαθμώμενον μέτρον. By both which is meant that a Talent was the biggest of all weights. μέτρον with the Greeks signified in general the measure of things by the bulk, whether dry or liquid, and also the measure of weights and distances.

A Talent was twofold, signifying either so much weight or a sum of money: the value of it differ’d according to the different Ages and Countries in which it was used.

Every
Weights and Measures, &c.

Every Talent consists of 60 Mina, and every Mina of 100 Drachmes, but the Talents differ in weight according to the different Mina and Drachmes of which they were composed; there was an ancient Attick Talent said to consist of 80 Mina, and Authors distinguish that from the Talent of 60 Mina. This is what Livy means, when he speaks of Antiochus’s Tribute of 12,000 Talents to be paid in 12 years in equal Sums, every Talent to be no less than 80 Roman Pounds; this great Talent is likewise gather’d from Plautus in his Mostellaria, when Tranio saith there were four times 40 Mine owing, Simo answers, then we must have as many Talents as you and I, that is two. But all this may mean that the old Attick Talent was then fallen in value. A Talent of 80 Roman Libra would make the Mina equal to 1; of the Libra: which if it was the numerary Pondus, would make the Talent of 80 Attick Mina; if it is the Ponderal Libra, then it will make the Mina of 7608 Grains, about our Averdupois Pound.

The lesser Attick Talent contain’d 60 Mina Attica. Suidas saith, τάλαντων μνήμων έστιν έξήκοντα. And Pollux lib. 9. τάλαντων τε αξιον κατάνοσ έξήκοντα μνήμων ατικάς. Rhemnius has the following verses.

Cecropium superest post hac docuisse talentum:
Sexaginta Minas, seu vis sex millia Drachmas.
Quod summum doctis perhibetur pondus Athenis.

Talentum Euboicum, so called from Eubea an Island near the coast of Attica, is mention’d by Livy. Some think it to be the same with the Attick Talent, because both those Countries used the same weights. For the Mina Euboica was centenaria, or consisted of 100 Drachme Attica, as well as the Attick Mina. Herodotus saith the Babylonian Talent was equal to 70 Mina Euboea, and Pollux affirmeth that it was equal to 7000 Drachme Attica; whence it follows

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b Liv. lib. 8. Decad. 4. c Herodot. lib. 3.
d Pollux lib. 9.
Tables of Ancient Coins,

alows that 70 Mina Euboica were equal to 7000 Drachma Attica, and consequently one Mina Euboica equal to 100 Drachma Attica, which is exactly the number of Drachma in the Attick Mina.

It was by the Euboean Talent, that Darius King of Persia order'd the Gold in his Dominions to be paid him.

Talentum Aegineum, so called from the Island Aegina on the coast of Greece, contain'd 6000 Aeginae Drachma, which according to Pollux make 10000 Attick Drachma. A. Golius takes a Talent or 10000 Drachma for the same, and makes it 10000 Denarii in Roman money, and in English money.

Talentum Rhodium, according to a passage in Festus Pompeius, is much less than it is made in the Tables, being only worth 4000 Denarii; but there is a great dispute about this passage, and it is supposed to be corrupted: for it is contradicted by another of the same Author, where he saith that the Rhodian Talent is equal to 4000 Cythophori and 500 Denarii.

Talentum Babylonicum, according to Herodotus, is equal to 70 Euboick or Attick Mina. Pollux affirms the same thing, and so doth Aelian.

The Syrian Talent is equal to 15 Attick Mina, or 1500 Attick Drachms.

The Egyptian Talent, as by the Table, consisted of 80 Attick Mina. Darius the Son of Hystaspes the Monarch of Persia, ordered his Silver to be paid in Babylonian Talents, and his Gold in Euboick.

There is some diversity of opinions in Authors about fixing the value of those Talents: the Tables are made on the best Information I could get.

There is another Talent much older and much less than any of the above-mentioned, which we may call the Homerical Talent of Gold, supposed to be equal to 3 Attick Aurei. Pollux speaks of such a Talent. Eustathius upon Homer reckons it worth 24 Drachma:

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Weights and Measures, &c.

Drachma: perhaps it may be of uncertain value, but that it was an inconsiderable sum, is conjectured from the passage of Homer, where describing the prizes at the funeral of Patroclus, he puts them in the following order. First, the captive woman and a Tripod; Second, a Mare big with Foal; Third, a Kettle; Fourth, two Talents of Gold; Fifth, a Brass Vial. Where the two Talents of Gold are proposed as the most inconsiderable prize but one. Several authors write, that amongst the old Greeks a Talent of Gold was very small; and the conjecture of the learned Bishop of Bath and Wells seems to be well founded, "that this Talent of Gold, tho' not equinumerant (Ἰσογράφοις the phrase is) nor yet equiponderant (Ἰσονικότιμον) as to any other; yet was equivalent (Ἰσοοικισμοὶ) to some correspondent Talent in Brass, whatsoever it was, whose under parts kept the common proportion between themselves; 2 Talent we may suppose of the Phenicians, the great Merchants remembered by Homer. For example, if we take the value of Gold to Silver to have anciently been, as ten to one; the rate it bore for a long time in Greece. And if we suppose the value of Silver to the Brass of the Cyprians, or Copper, to have been with their neighbours the Phenicians, as one to a hundred (and for a long time it has since generally went not much above that value:) we then have six Attick (or Tyrian) Drachma's weight of Gold equal in value to six thousand Drachma's weight of Brass.

According to this ancient Talent some reckon the Treasure of King David, particularly that mention'd 1 Chronicles xxii. Now behold in my Trouble I have prepared for the House of the Lord a hundred thousand Talents of Gold, and a thousand thousand Talents of Silver: which according to the common reckoning would amount in Gold Talents to the value of 547,500,000 l. and the Silver to above 342,000,000 l.

Or reckoning according to the decuple proportion of Gold to Silver, the two Sums would be equal.
Tables of Ancient Coins,

Josephus lib. 7. Antiquit. mentioning the same passage, calls both the Gold and Silver but 100,000 Talents, by which it seems he spoke according to some more modern calculation.

David reigned in Judæa after the Siege of Troy, as may be gathered from the Chronicles of Eusebius; so that it is no ways improbable but Homer and he might use the same numeral Talent of Gold.

But Pollux and Suidas inform us of a particular way of reckoning by Talents in the more early times; viz. Tertium Semitalentum signified \( \frac{2}{3} \) Talents, quintum Semitalentum signified \( \frac{4}{3} \) Talents, septimum Semitalentum signified \( 6 \frac{2}{3} \) Talents, and in short whatever number was join'd to Semitalentum signified the immediate foregoing number of Talents, and half a Talent more.

It's plain that the Latins admitted this way of reckoning sometimes, from the word Sestertius, which signifies tertius semis, or \( \frac{2}{3} \) Asses; and in the Law of the XII Tables pes tertius is put for 2 feet and \( \frac{1}{2} \).

C H A P. V.

Of the Jewish Coins, in which their Weights are likewise consider'd.

As the Romans reckon'd by Sestertii and Denarii, the Greeks by Drachms, so the Hebrews reckon'd their Sums of Money by Shekels; which is a word (as those skill'd in the Hebrew say) which comes from a verb Sakal, which signifies to weigh: it was called by the Greeks σῖκλος and σῖγλος. The Persians and Egyptians

* Pollux ἀρχιαὶ ἡ χρῆσις, χαὶ ἡ τὸ σίκλος ποι ἐναὶ δόλι, ἵππος καὶ ἐγσίων, τὸ ἔζον, ἀγ χρηστοφορεῖ ἀπὸ τοῦ, ὁπετεῖ ὁμέταλασθεὶς, ἡ παραμέτρις τὸ δύο. οὖν ἵππος τὸ ἱμιου τάλασσα τρία ἰμιου τάλασσα ντο χοροῦ, ἀες χρηστοφορεῖς, τὸ ημιού τό πολυς, τάλασσα λίγως, ὃς χρηστοφορεῖς ἐν τῷ ἑμιού φάσει νον, ἀποτεῖτο ὑμεταταλασθεὶς, ἐν ὑπέρ ἑπταλογίᾳ 1 ονευ ἑσεῖ.
Egyptians made use of the same word, to express a certain Coin. The following Tables are founded upon the Rabbinical Supposition, and that of Dr. Cumberland late Bishop of Peterburgh, viz. that the weight of a Shekel is half a Roman or half an Ounce Averdupois, which according to Dr. Cumberland is 219 Grains, Troy weight, according to the supposition in the Tables 218 ½, which perhaps may be a mistake; but as I said before, the proportion of the Averdupois Ounce to the Troy Ounce, that was given me as a true one, was 51 to 56. The difference is very inconsiderable, being only ½ of a Grain in half an Ounce.

This value of the Shekel has been collected from the experiment of weighing several remaining Shekels. From the testimony of the later Ancients the Bishop of Peterburgh quotes that of St. Jerome on the 4th Chapter of Ezekiel, who affirms the Shekel to contain four Drachms of the Latin Ounce: and is agreeable to the concurrent testimonies of all the Rabbins. According to this weight and the value of Silver, suppos’d to be in the Tables at 5 Shillings the Ounce, the Shekel must be in English Money 2 s. 3 ½ d. for which fraction ½ of a Penny, I have put for some conveniency in computation, and approaching nearer to the real value of our Silver: The difference being less than ½ of a Farthing.

But because I will conceal nothing, that may tend to the information of my Reader, I must acquaint him that the learned Bishop of Bath and Wells is of opinion, “that the Talmudical Jews have deliver’d to us a very different value of the old Hebrew Coins, from what some great Men of their own nation, Philo and Josephus, had formerly given us; and that for example, when these had rated a Shekel to us at near 272 of our Grains, and a quarter Shekel, at 68, those have lower’d the Shekel to 219, and brought down the Zuzza to an equality with the Roman Drachma;” and what the Bishop saith is indeed true. *For Josephus reckons the half Shekel or what they call the Siclus profanus, as a Didrachm, and puts for 5000 such Shekels μυγιας deoxmias:

*a Joseph. lib. 3. 6 μη νυμα ελης 4εολον εν ατηνας δεξιας μεγες, this is said of the Siclus dace.
Tables of Ancient Coins,

_δεξιάς:_ And the sacred Shekel he reckons as a Tetradrachm; and so it is in Hesychius. Philo likewise, who lived in the time of Claudius, positively affirms that the Shekel of the Hebrews was equal to the Tetradrachm of the Athenians. And this value of the Shekel is the same which is given it by the LXX Interpreters. They render a Shekel of 20 Gerahs by Didrachmum the Alexandrian Coin, which was equal to the Attick Tetradrachm.

The Bishop supposes that St. Jerome and Epiphanius, who are quoted against this opinion, when they mention the proportion of the Jewish weights to the Libra and Ounce, mean an Attick Ounce and an Attick Pound greater than the Roman. The Reader will easily perceive that according to this way of reckoning, the Shekel must have weighed 4 x 67 or 4 x 68.4 Grains; which as a Coin would make, 2 s. 9 d., or 2 s. 10 d.

The Type and Inscription of the Shekel was in Hebrew letters, on one Side SEKEL BISRAEL, (that is, a Shekel in Israel) with an Altar or Chalice smocking Incense: on the reverse HKADOSCH IERUSALAIM (that is, holy Jerusalem) with Aaron’s Rod budding.

The half Shekel was called Beka, from the verb Baka, which signifies divided in two parts. It was the same with the Didrachmum, or what they call the Siclus profanus.

The Pole-Tax of the Jews under the Government of the Romans was this Didrachm.

The Zuzah was the fourth part of a Shekel, for so the fourth part of a Shekel in Samuel ix. is translated by the Chaldee Paraphraist. This is not mention’d in the Tables, because not so common.

Gerah was the twentieth part of a Shekel, and is understood to be the same with Agorah mention’d in Samuel ii. 36. The LXX interpret Gerah an Obolus, which is the small Coin that comes the nearest to it; but a Gerah being 1/20 of a Tetradrachm, must have

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have been of a Drachm, of which the Obolus is the \( \frac{1}{12} \). Tho' Bishop Cumberland saith that there are Assick Oboli still remaining of 1095 Grains mention'd by Mr. Greaves, which prove that the weight of the Shekel hath been rightly stated 219 Grains.

The greater sums of Money and Weights among the Hebrews were a Talent and Maneh. A Talent was 3000 Shekels, as appears by Exod. xxxviii. 25, 26. which runs thus. And the Silver of them that were numbered of the congregation, was an hundred Talents, and a thousand seven hundred and threescore and fifteen Shekels, after the Shekel of the Sanctuary. A Bekah for every man, that is half a Shekel, after the Shekel of the Sanctuary, for every one that was to be numbered from twenty years old and upward, for six hundred thousand, and three thousand and five hundred and fifty men. So 603550 half Shekels or 301775 Shekels made 100 Talents and 1775 Shekels over: which subtracted from the former sum leaves 300000 equal to 100 Talents, or 3000 Shekels equal to one Talent.

In the computation of the Maneh, Dr. Cumberland commits a mistake: for the Maneh (saith he) "being set for a mere weight " without respect to Coinage, contain'd just 100 Shekels; this " seems clear by the comparing of 1 Kings vii. 17. (where it is " said that in each of Solomon's Shields there were three Manehs, " or, as we translate it, pounds of Gold) with 2 Chron. ix. 16. " where our Translation affirms that 3000 Shekels of Gold went " to one of those Shields. And indeed tho' the word Shekel be " not in the Original express, yet it must be understood; because " Ezekiel assures us, Ezek. xlv. '12. that by the Shekel the Maneh " was adjusted. And Pollux lib. 9 cap. 6. affirms, that when we " say a Golden One, we understand a  săraj; as when we say a " Silver piece, we mean a Shekel." According to this rate of the Maneh, a Talent would contain 5000 Shekels, whereas it is acknowledged by all to contain only 3000. It is plain that the nummary Maneh consisted only of 60 Shekels, for Ezekiel Chap. xlv. 12. reckons 20, 25, and 15 Shekels to the Maneh, which make
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make the number 60. The ponderal Meneb consisted only of 50 Shekels. The Talent was the same in both, consisting of 3000 Shekels.

There is another passage concerning the weight of Absalom's hair, which is said to weigh 200 Shekels, 2 Sam. xiv. 26. This Josephus calls 5 Minae, which would make the Mina to consist of 40 Shekels, and hath made some imagine there were Sicli Tridrachmi. For the clearing of this matter I refer the Reader to the learned Bishop of Bath and Wells, in his ingenious enquiry into the State of ancient Weights and Measures, pag. 196. the whole being too long to insert here.

The Rabbins affirm that the Jewish Weights and Coins received a considerable alteration after the Babylonish Captivity, of which there cannot be a more distinct Account than what is given by the above-mention'd learned Prelate. "The Standard of their Money under the second Temple was ½ of that under the first. These new pieces of Money went also under different names, than those had with which they nearly corresponded. For the ½ of the old Shekel was styled a Sela; and the ¼ of a half Shekel was called a Tobba; and the ¼ of a quarter Shekel, a Deinar; and the Gera, which was the 20 of an old Shekel, and was now to be the 24 of the new Sela, tho' it remained in the account, yet took a new name; and was termed a Mea. These Chaldaick or Syriack appellations (as all are so, excepting the Deinar) these new Coins are presumed to have brought from Babylon:

- which was a double Sela, and ½ of a double Shekel, and called a Darcon. All these pieces of money down to the Gera; or as they call it Mea, which is they say the lowest Silver piece; and also the minuter Subdivisions of the weight of that Species into Grains, and Peruta's; are with the relation they bear to one another represented in the Table subjoined.

Peruta
The *Meah* is believed to be a *Chaldean* word. The *Chaldean Paraphrast* renders *Gerah* (Exod. xxx. Ezek. xlv.) by *Meah*, as the LXX does by *Obolus*. The *Sela* consisting of 24 *Meabs*, and the *Shekel* of 20 *Gerahs*, the *Dinar* of 6, and the quarter *Shekel* of 5, will make the *Shekel* bigger by one sixth part. The learned Prelate abovemention'd is of opinion that this increase of the *Jewish* money after the *Babylonish* captivity, is but an invention of the Rabbins; and that *Josephus* and *Philo*, who still make the *Jewish* "*Shekel* equal to the *Attick Tetradrachm*, must be allowed to take "place before the Compiler of the *Misna*, their authentick tradition, if wrote as early as they would have it, and in the time "of *Adrian*; and as for the *Talmud* or Comments on that *Misna*, "they are undoubtedly late compositions of earhsays, and taken "up at a great distance from the times they speak of.

He has given a most ingenious reason for this invention: which I will set down in his own words. "For when upon the destru-"ction of the Temple by *Titus*, the *Jews* were constrained to pay "the half *Shekel* yearly due to That, into the *Roman* Treasury; it "was then their interest to bring this offering to a low Estimate,"at some favourable opportunity: And this they might effect, to "the diminution of it to a sixth part, if they could persuade one "of the mild Emperors after *Hadrian*, who had not been provoked "by them, *Alexander* for example, that such *Shekels* as had "been coined by their late Princes, such as they now shew to per-"suade us into that opinion, were the old ones in which that "*duty"
"duty was to be paid by their Law. And such a persuasion might be the more acceptable to the Romans; because it gave their Standard so high an Antiquity, and made it as old as Moses. For such a notion from the Jews would have been as flattering now to their Masters, as the Coinage had been before: And they might by it claim some kindred with them, as their Ancestors had prepared for it before; when in their exigence they challenged kindred with the Spartans; who, as Dionysius Hec- licanus tells us, had a better title to that ambitious pretence. He proposes the Phoenician money as a medium to attain the Knowledge of the Hebrew, for several very weighty considerations; particularly the Tyrian Talent is said by ancient Authors to be equal to the Attic.

There is mention made in the Scripture of a Ketsab or Lamb, Gen. xxxiii. 19. And he bought a parcel of a field, where he had spread his Tent, at the hand of the Children of Hamor Shobem's father, for an hundred pieces of money, (Kesoth, which signifies Lambs. Every one gave him a piece of money, Job xlii. 11. This piece of Money was so called from the Stamp of a Lamb.

When the word Kesheth is put with a number in the Old Testament, and rendered in our translation pieces of Money, it is commonly understood of Shekels.

In the new Testament the Coins commonly mention'd are the Roman Denarius, the As, the Assarion, Matth. x. 29. determin'd by Cleopatra to be 1 of the As: Quadrans, 1 of an As. Matth. v. 26. and the half of the Quadrans called Asella, which we translate a Mite.
Of the Proportion of the Value of Gold to Silver amongst the Ancients, and of their Gold Coins.

The lowest Rate of Gold we find mention'd amongst the Romans, came from an accidental cause. The vast quantity of Gold which Julius Caesar had got by plundering Cities and Temples (which, as Suetonius faith, he destroy'd from a motive of Covetousness, rather than Revenge) made it such a drug, that he exchanged a Pound of Gold for 3,000 Nummi: In 3,000 Nummi there are 750 Denarii, and in a pound 84 Denarii; therefore according to this Reckoning, the proportion of the value of Gold to that of Silver is as 750 to 84, or as 123 to 14, which is nearly as 9 to 1. Some Authors from this passage of Suetonius infer that the proportion was 7½ to 1; but this mistake ariseth from their considering the Roman Ounce as consisting of 8 Denarii as the Attick, whereas it consisted but of seven.

The most common, constant, and stated rate of Gold to Silver was the Decuple, which Julius Pollux confirms from Menander the Poet, calling a Talent of Gold Δεκατάλασσον.

Thus Hesychius from Polemarcho; An Aureus is 2 Drachms, and a Drachm of Gold is worth 10 Drachms of Silver. The same proportion is assign'd by Livy, it being permitted to the Aetolians to pay one Talent of Gold for 10 of Silver. The same proportion is allowed by Suidas.
Tables of Ancient Coins.

The duodecuple proportion is mention'd by Plato in Hipparch, who makes Silver to Gold δοξασιον.

Stanislaus Grsepsius a learned Polander endeavour to establisht the duodecuple proportion amongst the Jews, by comparing some passages of Scripture together, and with others in Josephus. But I believe they will hardly prove his point. The proportion of the value of those Metals amongst the Jews, was the same as amongst their neighbour Nations.

There is another proportion assign'd for the Classical age, viz. that of 12 ¼ to 1: Which they say is plain, because the Roman Aureus, supposing it equal to the Attick Didrachm, was exchang'd for 25 Denarii. This indeed is evident; for centum Aurei, the fee of Advocates in Ulpian, is express'd by Tacitus, dana Sestertia. That is 100 Aurei are equal to 10000 Nummi; or 1 Aureus equal to 100 Nummi; from which it follows that 2 Drachms of Gold were worth 25 in Silver, 100 Nummi being 25 Drachme or Denarii. And the Centeni Nummi of Tacitus is called by Suetonius an Aureus, both of them speaking of the Liberality of Otho to Galba's Guards.

Dion affirms directly that an Aureus was worth 25 Drachma, which Xiphilinus reads 25 Denarii.

But here a difficulty ariseth; for it was as certainly known that the Attick Aurei changed at the rate of 20 Drachma of Silver for 1 of Gold. Zonaras faith in express Terms, that amongst the Romans an Aureus was exchanged for 25 Drachma, amongst the Athenians only for 20. If the Coins were of the same fineness and weight, this would make a great difference in the value of the two Mettals in two Cities, which were in constant Commerce with one another. This is a direct impossibility, because the Silver would be exported from the one place, and the Gold from the other, until the Balance was justly settled. There are but two ways of solving this difficulty, by supposing the Roman Aureus finer, or heavier.

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vier than the Attick. G. Agricola and some others take the former, and Gronovius I think for very good reason the latter.

Agricola reasons thus: Crates a Comick Athenian Poet, makes the Semifexta of an Aureus equal to 8 Oboli, therefore 16 Oboli were equal to a Sexta, but 6 Oboli were equal to a Drachm; Therefore 6 times 16, making 96 Oboli, or 16 Silver Drachmae, were equal to the Aureus of 2 Drachms. Consequently there must have been one 5th part Brasis in it; for if it had been of pure Gold like the Darick, it would have been exchange’d for 20 Silver Drachms. But the misfortune of this Argument is, that the Athenian Didrachm and Darick Stater were commonly exchange’d for one another: and the Athenians had the reputation of having the finest and fairest Coins in the world. καλλιστα κοιλιν, &c. Aristophanes.

They urge likewise for this opinion of the proportion of Gold to Silver, being 12 to 1, a passage of Pliny, where he saith the Byssin, a sort of substance which the Ladies spun into thread, was exchanged like Gold for 4 Denarii the scruple. That makes the Didrachm 24 Denarii. But this passage is nothing to the purpose, for if Drachma here be meant of the Attick Drachm of which the Aureus made two, it will make the proportion of 12 to 1. If it be understood of the Roman Drachm one 8th of their Ounce, it will make it 13,7 to 1, neither of which is to the purpose. Therefore in all appearance Pliny put a round number near the truth rather than a fraction. For which reason Gronovius believes that the Decuple proportion subsisted, but that the Roman Aurei were first of a greater weight, than the Athenian Didrachmus, which he thinks is justified by the weights of several still extant. The Roman Aurei, which were first coin’d of 7½ Scruples came by degrees in Constantine’s time to be only 4 Scruples, called Soli, and sometimes Sextula.

A passage in the Code, de Argenti pretio, runs thus, Fubemus ut pro. Argenti summa quam quis Thefauris fuerit illatusus, inferendi Auri accipiat facultatem, ita ut pro singulis libris Argenti, quinos solidos inferat. Supposing the Soli to be 4 Scruples, 20 Scruples of Gold
Tables of Ancient Coins,

Gold were changed for 2.8 Stater of Silver, this makes the proportion of Gold to Silver as 14 
1 to 1.

There were of Cretan Gold Coins, the Stater Aureus Atticus, which was a Didrachm, the weight of two Drachms.

Also some Tetradrachms called Πλωκίας Πιούκιας, nothing int
rectius, from the Stamp of an Owl upon them.

There was likewise the Stater Aureus Philippeus, Didrachms struck by Philip of Macedon. Horace terms them in those, Philippus.

Retulit acceptos regale nominare Philippus.

Those according to their weight and the Double proportion of Gold to Silver, which then obtain'd, were worth 20 Drachms or Denarii, or 12 s. 4½ d. It was observ'd before that the Roman Aurei fallly suppos'd to be of the same weight, were worth 2 ½ Denarii or 16 s. 1½ d.

Stater Alexandrinus, some Didrachms, some Tridrachms.

Stater Aureus Philip King of Bithynia.

Stater Cyzicenius, exchanged for 2.8 Attick Drachms, i.e. 18 s. 1 d. Some make the Stater Alexandrinus and the Stater Philippeus of the same value with the Stater Cyzicenius: and accordingly they are stated in the Tables.

The Cyzicenian Staters were struck with the figure of a Cybele.

There is mention made of a Stater of the Phocaita, by Thucy
dides. Phocaita was a City in Ionia.

Διαγυνιας or Διαγυνιας, first they were coin'd Didrachms, but afterwards they were coin'd Tetradrachms: and Josephus makes them equal to the Jewish Shekel.

Julius Pollux makes a Stater worth a Mina, which must be understood of one of 8 Drachms; according to which proportion the Tetradrachm was worth 50 Attick Drachms. This proportion is observed in the Tables, which I have not chang'd, being according to the Roman way of reckoning, 25 Denarii for

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a Pollux lib. 4. cap. 24. b Demosthenes. c φυσιτας την οπισθα αναβας οικεγενες. c Suidas.
Weights and Measures, &c.

the Aureus: tho' the double proportion of Gold to Silver obtain'd and was the most common way of computing.

The Hebrew Aureus was sometimes drachmal, or ⅔ sometimes ⅔ of the Shekel or Silver Coin. It was called Drachma. We have observ'd before that Josephus differs from the Rabbins in the account of the Jewish Weights and Measures: according to his reckoning, the Shekel is equal to the Attic Tritadrachmen; according to the Rabbinical account, it is equal to four Roman Drachms, or ⅔ of the Roman Ounce. These two ways of reckoning will make an ⅔ part of difference in the value of their Gold as well as Silver Coins.

The Pondo or Libra Auri amongst the Romans, and the Mna amongst the Greeks, when it is nummary, or put for a Sum of money, always signifies 100 Drachmes.

The general supposition of Authors is, that there was a ⅔ part of Alloy in the Gold Coins of the Ancients.

I have estimated the Gold Coins according to the proportion of Gold to Silver, which then obtain'd. They would be of more value now amongst us according to their weight and fineness.

CHAP. VII.

Of Roman, Greek, and Arabian Weights.

ROMAN Weights.

THE Romans used the Libra, which they divided into ⅔ Unciae or Ounces, and the later Greeks in imitation of them had their Litra, which they divided after the same manner. This is plain from abundance of Authors, Lucius Matianus, Galen, &c.

They
Tables of Ancient Coins,

They divided their Ounce into 3 Duella, and likewise into 6 Sextula. Rheinius Fannius,

--- Drachma scrupulum si adjecero, sit
Sextula qua fertur, nam sex his uncia constat.
Sextula cum dupla est veteres dixere Duellam.
Duella Obolos habet sedecim, scrupula octo.

Another division of their Ounce was into 4 Sicilici. Sicilicus so called according to Festus Pompeius, quod semiunciam in duas partes fecit. Rhein. Fannius,

Drachmam si gemines, aderit, quem dicier audis
Sicilicus.

Sextula among the Greeks was called ἕξαγων and corruptly ζάγων:
ἡ ἕξαγων ἕξετε ἕξαγων ἕξ. Interpres Nicolli.

They likewise divided their Ounce into 7 Denarii. Corn. Celsus
lib. 5. cap. 17. Sed antea scire volo in uncia pondus Denariorum sep-
tem esse. Plin. lib. 33. cap. 9. speaking of the Denarius, alii de
pondere subtrahunt, cum sit justum octoginta quatuor e libris signari. 8.4
in 12 Ounces is just 7 in an Ounce.

Then they divided it into 8 Drachms. Fannius, Galenus, Dios-
corides, Plinius, &c.

The 12th part of an Ounce they called dimidia Sextula, it was
likewise divided into 24 Scripula or rather Scriptula. The Greeks
called them γεωμετα. Fannius,

Semiobloli duplum est Obolus, quem pondere duplo
Gramma vocant, Scripulum nostri dixere priores.

The Denarius was divided in two Victoriati, not only as a piece-of
cap. 2, 5, 6. and Scribonius Largus in many places.

The
Weights and Measures, &c.

The Denarius was also divided into 6 Sextantes, Cor. Celsus, lib. 5: cap. 7. 17. in imitation of the 6 Oboli of the Drachma, according to which division a Sextans would contain in English Troy weight about 67 Grains.

Cornelius Celsus, lib. 4. cap. 4. mentions the Quadrans Denarii. Aut sulphuris ignem non experi pondo x & quadrans. And likewise the Triens Denarii lib. 4. Salis Ammoniaci, P. 3. boc est, Pondo triens.

The value of the Roman Pound is determin'd as in the Tables from the value of the Denarius, viz. 5245; Troy Grains; according to the common reckoning, it is 5256; this small difference, as I have said before, proceeds from assuming the Averdupois Ounce to the Troy Ounce precisely as 51 to 56. The rest of the parts of the pound follow from this, as in the Tables.

GREEK Weights.

THE Talent was the greatest Weight as well as the greatest Sum of money among the Greeks. And this ponderal Talent was divided, as the nummary Talent, into 60 Mina, and every Mina into 100 Drachma. The Coin was so call'd, because it weighed a Drachma. Rhemnius Fannius,

In Scrupulos ternos Drachmam, quo pondere dolis
Argenti faciliis signatur nummus Athenis.

A Drachma was of the Ounce, and part of a Mina; tho' perhaps this way of reckoning by Ounces and Drachms was borrowed by the Greeks from the Romans; for the old Division of the Drachma was into 6 Oboli. Suidas δραχμα εξ ὀβολῶν. The Didrachmum, Hemidrachmum, &c. express'd Weights as well as Coins. The Greeks used the expression τετοιον ἰμίδερχου, to signify 2½ Drachms, as well as τετοιον ἰμισαλαδου.
Tables of Ancient Coins.

An Osola contained 6 

Aureoli, or as the Latins call them Aereoli. Suidas also Diodorus, ὄσσολος ὁμοίος Ἀλμυρίας ἐστι 

Aureoli. Among the Athenians consists of 6 Aureoli. The Greeks used the word δίακόλος; the Latins translated it not diakola, but diakolus. Plin. lib. 20. Minus in Acetopondere Obolorum duas. And almost everywhere so.

An ἡμιάρεολος, or Semi-Aureus, contains one Silique and one half; and 4 Aereoli according to Cleopatra, but 3 only according to Diodorus and Suidas.

Χαλκός, or Aereus; contained the 6th part of an Obolus: and 7 Aschel, according to Suidas. ὁ δὲ τετράχρυσος ἄσσηλον ἴδιος, that is, contained 7 Aschel.

Aschel was the 7th part of an Aereus, and was called by the Latins Minuta, and sometimes Minutiae, and is now divided into any lesser Weight.

The Greeks used the ἐφύστεια and divided it as the Romans did: when they began to use that Measure, is somewhat uncertain. I did not think there was any particular Table necessary for that division of Grecian Weights. They us'd the νεκτάτεια, in Latin Siliqua; which was the 18th part of a Drachma, as appears from Heliodorus.

The Medical Weights, were the Mina, of 16 Roman Ounces, as appears by Dioscorides and Galen, and Cleopatra in Cosmoticis, who tells you that Mina as a Weight contains 16 Ounces, 128 Drachmas, 384 Scripula, 768 Oboli, 1052 Lupini, 2304 Silique, 6144 Aereoli. But when Celsus and Scribonius Largus make use of a Denarius of about 62 ½ Grains, the Drachma being supposed equal to that, 100 such Drachma must have made a Mina of 6222 ½ Grains, whereas a Mina of 16 Ounces is about 7000 Troy Grains, or our Averdupois pound. The reason of this difference is assign'd before.

The Physicians likewise made use of the Litra of 96 Drachmes. The effyce or uncia being divided as usually. This last way of reckoning was common after Galen's time. The kegovitον or Siliqua, mention'd
Weights and Measures, &c.

mention'd before, was likewise a common weight amongst the Physicians: and the \( \text{quin} \) or Grain, \( \frac{1}{2} \) of the Sitoaus.

There were among the Greeks, Hippocratis, or what we might translate in English, Parrius weights: or, as they were called by some, Malamensis, Male Doctors. They are mention'd by an uncertain Greek Author. The Mina Hippocratis contain'd 15 Ounces, \( \text{dram} \) 112 \( \frac{1}{4} \); the Libra contain'd 90 Drachms, the Ounce 7 \( \frac{1}{4} \) Drachms; the Drachm 3 Scripules or 6 Oboli.

The Romans dividing their Ounce into 7 Denarii, and likewise into 8 Drachms, the Greeks of later ages dividing likewise their Ounce into 8 Drachms, and the Roman Denarius being supposed equal to the Greek Drachma, have occasion'd great confusion in the expressions of Authors, about the weights of both Nations, most of them asserting that the Attick Tetradrachm was \( \frac{1}{4} \) of an Ounce, and the Didrachm \( \frac{1}{4} \), &c. This difficulty has been still increased by the Diminution of the weight of the Coins of both Nations. Besides some of the antient Attick Drachms weighing 67 Grains, and the Denarius only 62, occasion'd a new difficulty how to preserve the equality that is supposed between these two Coins.

The learned Bishop Hooper supposes that "the Attick Drachma might change as a Coin, and the Weight continue the same: that when the Athenians, in imitation of the Romans, divided their Ounce into 8 parts under the name of Drachmas, for the easier management of this account they divided not their 100 Drachma's into 12 Ounces, but 100 lacking 4; by which means, in perfect conformity to the old Roman division, and to the latter of the Ounce into eights, they had a Libra of their own, wanting but little of their Mina, and consisting of 96 of their own Drachma's, such as were not 96 of the Roman, but Attick Pound.

It is evident there was an ancient Attick Mina of 16 Roman Ounces. All Authors, and particularly the fragment printed with Galen of the Composition of Medicines, agree in this. It is affirmed, in Cap. 2. of the fragment, that the Attick and Egyptian Mina contain 16 Ounces.
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16 Ounces. Cleopatra cap. 7. saith a Mina weighs 16 Ounces. But in another place of the same Author it is said, an Attick Mina has 12 Ounces, (the Semis is here omitted) and another Mina has 16 Ounces. When they speak of Ounces, they mean the Roman, which is our Averduois Ounce. By which it seems there are two different Mina describ'd, one of 12, 1 Ounces, which I suppose was the latter, and another of 16 Ounces the more antient. So that the most ancient Mina Attica was exactly our Averduois Pound. This agrees with the Talents beforementioned, in which Antiochus was order'd to pay his Tribute. Livy saith that each Talent was to consist of 80 Roman Pounds, that is of 960 Roman Ounces, which are exactly the number of Ounces in a Talent of 60 Mina, when each Mina contains 16 Ounces.

That the Attick Drachm fell from 70 Grains to about 62, 1 is as plain, because it was equal to the Roman Denarius of that weight. Therefore I thought fit to adjust likewise the Weights of that time according to this Standard: for undoubtedly there were such weights which the Physicians used, who, tho' they might reckon according to the weight of the Money, they did not weigh their Drugs with pieces of Money. And it is plain likewise from their Prescriptions that they often follow'd Hippocrates in his Doses, and no question adjusted their weights to those which he used. Therefore I have fram'd one Table of the elder Greek weights with a Drachm of 70 Troy Grains, and a Mina equal to our Averduois Pound; and two other Tables of later Greek and Roman Weights blended together, one for the lesser, and another for the greater, which is proper for those times when both Nations reckon'd after the same manner: The Greeks making use of the Roman Xirege and its Subdivisions, which I suppose all this while did not change.

This is the supposition of most Authors who have wrote upon the Subject; and if it be an Error, it is a very general one. And I may at least be forgiven for understanding them according to the plain sense of their words, as they are printed.

Accipe
Weights and Measures, &c.

Accipe præterea parvo quam nomine Graii
Mnam vocitam; nostriquè Minam dixer priores.
Centum ha sunt Drachma; quod si decerpseris illis
Quatuor, efficies hanc nostram denique Libram,
Attica qua sit, si quartam dempseris hinc Mna.

Rhemn. Fannius.

Cleopatra Cap. 7. (before cited) speaks of two different Mina, the first of ı 6 Ounces; and afterwards adds Mina Attica habet 3xii. semis, i.e. has ı 2 ; Ounces; which I think must be understood of the same denomination with the former, viz. Roman Ounces. And again, cap. 8. The Attick Mina has ı 2 Ounces (the Semis must certainly have been forgot.) There is another, faith he, of ı 6 Ounces, which is the old Mina of all mention'd before.

Dioscorides mentions only that of ı 6 Ounces; and tho' it is mentioned by the Physicians, it is not what they prescribed by, but perhaps like our Averdupois weight, what their grogs drugs were at first fold and bought by.

I am far from being positive in this hypothesis; for I think that of the learned Bishop so often mention'd, viz. That the Athenians had a Libra of their own, consisting of 36 of their own Drachms, is supported with very strong arguments; and to confirm it still more, that learned Prelate has restored some of the Readings of the Authors with great sagacity.

ARABIAN Weights.

The Arabian Weights us'd by their Physicians, Serapio, Rhæfis and Avicenna, are a mixture of the Greek and Roman Weights, and derived from them. Their Manes is a corruption of the Hebrew Maneh or the Greek Mina: there were two of them, one
Tables of Ancient Coins,

one of twenty Ounces, and another of sixteen. I refer the Reader to the Table for the best account that is given of them by their own Authors. But I trust more to that of the learned Bishop of Bath and Wells.

The Ratel or Litra, (called Rotulus in the Tables,) used all over Ægypt, and the neighbouring Eastern Countries, is as the Bishop observes "of different quantities in several places, and in the same place for several goods; but always divided into 12 parts, which are their Ounces. These Ounces therefore are different; and in this that some consist of more, some of fewer little Weights, which they call Dirhems, which are always the same.

This constant universal weight a Dirhem is divided into 12 Carats, and each Carat into 4 Grains; the whole number of Grains in a Dirhem being 48. This account the Bishop takes from Golius, Lex. Arab. These grains, according to Mr. Greaves's account, are almost the same with ours, 48 of our Grains exceeding 48 of theirs, or their Dirhem, only by 0.18 parts of a Grain. Consequently our Pennyweight exceeds their half Dirhem, by 0.09 (not the tenth of a single Grain.) And so our Troy Ounce = 20 pennyweights, is not two whole grains more than 10 of their Dirhems = 480 of their Grains; and therefore may very well pass for one of those various Ounces of Ægypt, and which consisted of 10 Dirhems.

Of the several Ounces, that of 12 Dirhems is especially to be mark'd. It is specified by Golius as the Ounce by which things of less bulk and greater value, particularly Medicinal Drugs, are usually weighed: And this is the Ounce or \( \frac{1}{4} \) of that Ratel of Cairo which Mr. Greaves, by experimental observation, gives us at 6886 of our Troy Grains, and is \( 12 \times 12 \times 48 = 6912 \) of theirs, as the Ounce accordingly is \( 573.8 \) of our Grains, and 576 of theirs.

And here it is apparent, that their number of Grains to the Cairo Ounce 576, is the same number of Grains which the Romans, and Spaniards and French reckon to their Ounce, tho' much
Weights and Measures, &c.

much less. And that the number 6912 in the Cairo Ratel,
its fame with that of Grains in the Roman Pound, and in
such a Spanisb and French Pound, as is counted by 12 Ounces.
It is also observable, that the Cairo Ratel differs so little from
the Spanisb, and our Averdupois Pound, which are of 116
Ounces, and from the Roman Mina Medicorum which reckons
as many; that it may well be esteem'd as the Standard, from
whence the European were design'd to be taken.
And we shall less wonder at all these particulars, as that our
Troy Grains are found equal to theirs, and our Pennyweight
(our Silverling) to their half Dirhem; or that the Division of
the European Ounce was fram'd by that of Cairo; or that those Pounds
are from the Ratel of that place: when we consider that Cairo or Mem-
phis, in whose stead it succeeded, was in the heart of Aegypt; and in
the way from the Red Sea (by which all the Arabian and Indian
Goods were brought, till about 300 years ago) to Alexandria;
that Alexandria, until then, had been the great Mart for all the
Countries in the West: And that the Saracens were not only
near and powerful neighbours to them, but drove a flourishing
Trade amongst them; and with their Jews, who were then
the great dealers in Money.
Now as our Troy Weight has appear'd to have been borrow'd
by us, from none of our European neighbours, but from Aegypt: so
too the Averdupois, tho' the fame with the Spanisb Pound, may
seem not to have been wholly owing to them; but to have
been adjusted at leaft by us from the Cairo Ratel. For the Ounce
we have, we divide not so into Grains, as the Spaniards do: and
we who borrow'd not our Ounce of 10 Dirhems at second-hand,
need not be thought to have taken that of about 9 Dirhems, the
Spanisb or Roman Ounce from any but the Original. And so
our Edward the first, who again settleth our Measures upon a
certain Standard; and who had indeed been a visitant in Spain,
but upon action in the Holy Land, may be fairly presum'd to
have fix'd both the one and the other Pound by the Measures of
the East.

C H A P.
CHAP. VIII.

Of Measures of Length, and Superficial Roman Measures.

In the construction of the Tables of Roman Measures of Length, I have follow'd Mr. Greaves, and taken the proportion from the Cossutian foot in Rome, which according to the English Standard is 11,604 Inches. The rest of the Measures are found on known proportions.

Digitus latus or transversus is the fourth part of a Palm, or the 16th part of a Foot.

Uncia contains a digit and a third part, it is the third part of a Palm and ¼ of a Foot. For the Pes or Foot, like an As or Unite, was divided into 12 parts. Roman Authors instead of Uncia use Pollex sometimes.

Palmus a Palm is ¼ of a Foot, from whence COLUMNELLA uses the expression ad Palmum decoquere.

This Palm was called the Palmus Minor to distinguish it from a greater, which some Authors make equal to 12 Digits.

Pes a Foot, as we said before, was divided as the As. Thus Pliny speaking of Cedar Tables tells us, that Tiberius had a Table exceeding four Feet by a Sextans and a Sicilicus, that is by 2 inches and a fourth part: and that the thickness was Sesuncialis, an inch and a half. Thus the same Author speaks of folia Trientalia, Trientalis Herba, that is 4 inches, and Herba Quincuncialis: So likewise Bessules Laterculi in Vitruvius, are Tiled 8 inches long. Sulcus Dodrantalis in Varro, is.

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* Julius Frontinus de Jure Limitum.
* Plin. lib. 15. cap. 44.
* lib. 21. cap. 33.
* lib. 13. cap. 15. Tiberio principi mensam quatuor pedes sexante & Sicilico excedentem:
Weights and Measures, &c.

is a furrow of 9 inches deep. Pliny mentions Pygmies who were not higher than ternos Dodrantes, that is 2 Feet and a Palm. Vitruvius saith, that steps should not be thicker dextrante, i.e. than 10 inches, nor thinner than dodrantes, i.e. 9 inches. In consequence of the Pes being reckon’d the As, Dupondium is used for 2 Feet, as you may read in Columella; which sentence at the bottom of the page might puzzle any Country-school-master, if he were not advertized of the meaning; therefore such little remarks, tho’ they may seem trifling to some, are useful to others. In the Laws of the XII Tables, Sestertius pes is used for 2 1/2 Feet: and tripedaneae Status in Pliny signify, Statues 3 Feet high: tho’ tripes in Livy signifies one with 3 feet.

A Foot was used for a little Measure proverbially.

The breadth of any Highway or Lane was to be at least 8 Feet when straight, and when turning, 16. by the Laws of the XII Tables.

Palmipes was another Roman Measure, the length of a Foot and a Palm, or 1 1/3 inches, or 20 digits. This Measure is used by Pliny, Columella, and Vitruvius. Cubitus, sometimes Cubitum in the neutral Gender, signifies the lower part of the Arm on which we lean. Kubite or Kubiton is a Dorick word, according to Julius Pollux; it is used among the Romans for a determin’d Measure of a Foot and a half. It contains, according to Vitruvius 6 Palms or 24 Digits. From Cubitus is Cubitalis. Thus when Pliny saith that some Indians had the soles of their Feet Cubitales, and that the Tails of the Sheep in Syria were Cubitales, and that some Indian Boars Tusks were Cubitales; it signifies according to English Measure 1 Foot = 5.406 Inches. Solinus uses Ulna for Cubitus. Where Pliny speaks of a Crocodile of 22 Cubits long, Solinus expresseth it by so many Ulnae. And Julius Pollux takes both words for the same.

\[\text{\ldots}\]
Table of Ancient Coins,

Same: τὸ Ἐκέλον καλέσου, they call a Cubitus an Ulna.

Pliny takes them for different Measures; for he speaks of a Plata-
num, 15 Cubits long, but in thickness quatuor Ulnae; by an Ulna
he understands here, the length from the tip of one finger to the
ip of the other, when a Man spreads his Arms. For, speaking
of a Fir-Tree, he expresseth it thus. Arboris ejus crassaude quatuor
bomnna ulnas complectentium implebat; & non ibid. Maxima Ce-
drus in Cypro traditur ad undecimem Demetrii sucisa, centum triginta
pedum; Crafitudinis vero ad trium hominum complexum. This Ulna
the Greeks express by δεκα, about 6 Feet: so that the Tree was
130 Roman Feet high, and 18 Feet in Circumference. Cubitus
takes Ulna in the same sense.

A Cubit was reckon'd by Aristotle the fourth part of the height
of a well-proportion'd human body. For he saith a Man is Ἐκοι
πέντε νύμφες τετράθυρα, or a walking Animal with two feet, and
four Cubits (above 6 Feet) high. There are several that pass for
human Creatures who are excluded by this definition.

Passus, so called a passus pedibus, is a space of 5 Feet long. Pliny
uses this Measure frequently in describing the distances of places.
Centenaria and Millenaria, when join'd to Substantives, passus is
often understood, as Porticus Centenarii, that is Portico's of 100
paces.

'Decempeda was a sort of measuring Rod for taking the dimen-
sions of Buildings, Area, Land, Ways, Meadows, Mines, &c. and
signified the same thing as Portica taken as a Measure of length.
From hence came Decempedator for a Surveyor used by Cicero.
'Decempeda was sometimes used for the Measure likewife, by the
same Author. 'The common word for a Surveyor was Finitor,
and the Law word Agrimenso.

'Stadium:

*Lib. 16. cap. 33. Antandri Platanus etiam 15
cecumdolati lateribus resili, 1 ponte faba, vi-
taque reddita, longituline XV Cubitorum,
crafitudine quatuor Ulnae. *Lib. 16.
cap. 40. b Lib. 4. cap. 3. Siambas manus
exprimis a pedore, in lineam rectam, ulna dic-
Cavebat etiam C. Antonio, qui fuerat equitii-
mus agri privati & publici decempedator.
Cicero Philip. 14. Quinti jam peritus & cal-
culus decempeda fuia facta diviserit. e Piutras.
in Ptegulio. Nunc regiones, limites, confinia
determinabo: ejus rei ego fui factus finitus:
Et Cicero contra Trullum. Finitorem mitar,
ratum fit, quod finitor uti illi, quos omnia
erit, rei restituerit.
Weights and Measures, &c.

A Stadium contain’d 125 Roman Paces, or 625 Feet, according to Pliny and Columella. Pliny tells you that Pythagoras a very sagacious man reckon’d the distance of the Moon 126,000 Stadia, and double of that to the Sun. A Stadium was of a Roman Mile, and equal to 120 English paces, 4 Feet and 4 Inches and \( \frac{1}{2} \). According to Pythagoras therefore the distance of the Moon from the Earth is about 144,18 \( \frac{1}{2} \) English Miles.

Milliare sometimes Milliariam so called from the thousand paces which it contain’d. Vitruvius makes 5,000 Feet and 1,000 paces the same thing. Columella tells you that a Stadium has 125 Passus, 625 Feet, which multiplied by 8 makes a Mile. Ciceron seldom uses the word Milliare, but mille passus. The Miles of old were mark’d with Stones, which were used to express Miles. Thus ad secundum Lapidem; citra octauum Lapidem; ad Lapidem duodecinum; XX. ab Urbe Lapidem. Bis decimis Lapis ab Urbe; denote so many Miles. Centum Millia is used in the Code, for centum millia. Valerius Probus saith the Ancients used ad quantum Cippum, instead of ad quantum Lapidem.

Boetius mentions the Gradus as a Roman Measure, which may be translated a step or the half of a Passus or Pace. But this word is not to be found in any Classical Author.

Some Writers mention Gramen as a Measure, being the fourth part of a Digit. All the Measures are comprehended in these verses:

Ex Granis Digitus quatuor formabietur unus:
Est quater in Palmæ Digitus; quater in Pede Palmæ:
Quingue Pede Passum faciunt; Passus quonque centum:
Viginti quinque Stadium dant; sed Milliare
Octo dabunt Stadia; at duplicatum dant tibi Lexum.

Schonerius de usi Globi, cap. 12.

[Footnotes: 1. Lib. 5. cap. 4. 2. Vitruv. lib. 10. 3. Decempeda duos cum femelle.]
Tables of Ancient Coins,

Of Superficial Measures, and some Terms of Husbandry.

A CTUS is the length of one furrow, as far as a Plough goes before it turns: it is properly translated in English a Furlong. This Measure is used by Pliny. Taken as a determin'd Measure it is 120 Roman Feet.

The Romans mention an Altus minimus, and quadratus. They tell you that the minimus was 120 Feet in length, and 4 in breadth. So Varro and Columella. The quadratus was the Square of 120 Feet, or 14400; this was called Modius and Mina.

Clima according to Columella is a Square, whose side is 60 Feet, being 3600 square Feet.

Versus was a length of 100 Feet, and a Square of 10000.

Jugurum, so called because it was a Space as much as could be tilled by a Jugum Bovum, or Yoke of Oxen in a Day, and perhaps as Pliny thinks from the word iunctum. Jugurum is the double of an Altus Quadratus or square Altus, being 120 Feet, and in breadth 240, making in square Feet 28800.

We may judge of the fertility of the Roman Land by several passages of Varro and Columella. Varro tells you that every Jugurum of Vines yielded 600 Urns of Wine: according to this proportion, our Acre should yield 55 hogheads and a little more. Columella tells you that each Jugurum of Vines in Seneca's land yielded 8 Culei, which makes 160 Amphorae: according to which our Acre would yield about 29; hogheads. The same Author faith that those Vineyards ought to be extirpated which yielded less than three Culei the Jugerum; that is those, where one of our Acres did not produce 17 hogheads.

As for the Indian Whales of four Acres, I refer the Reader to Pliny. Two Jugera were call'd by Varro, Haredium, quod Hredem

• Plin. lib. 18. cap. 3. p Varro lib. 3. cap. 9.
Weights and Measures, &c.

Columella tells you likewise that a Space of 180 Feet in length, and 30 in Breadth, was called 'Porca' by the Country people in Baetica. The same Author saith, that amongst the Gauls, in Towns a Space of 100 Feet, and in the Country of 150 Feet was named Candetum: and that they called a Semijugurum, Arpennem.

Centuria was a space of 200 Acres; it took its name first from a hundred, and being doubled retain'd still the same.

The Jugurum was an Integer, divided like the As into Uncia, Simiuncia, Drachma, &c. This appears from Columella and a passage in Pliny, and several other Authors.

Columella speaks of a Semiscrupulum of Ground as the least part of a Jugurum, which contains 50 Feet, and make the 576th part of the Jugurum. Varro reckons the Scrupulus or 100 Feet the least part. The Reader may see all the parts of the Jugurum in Columella, or in my Table. Livy uses the same way of expression. Terna jugera & septuncies virtutem diviserunt.

Of these Roman Measures, the Digit, Inch, Palm, Foot, Cubit, and Pace, were in use among the Architects. The Foot, Pace, Stadium, and Mile, among the Geographers. The writers of Husbandry reckon'd by Feet, passus, actus, Climata, Jugera, Stadia and Centuria.

Greek Measures.

The Romans borrowed their Measures from the Greeks, being about 16 in number, and commonly taken from the members of a human body. Δακυλη a finger's breadth, the fourth part of a Palm and ¼ of a Foot, just as among the Latins. Φυλα δικυλεια το πλατος, Leaves of the breadth of two fingers. Ρίζα ως τρικυλος το μυκος, a Root of the length of 3 fingers. Dioscorides.

Δοξων, from the verb δοξωμαι, which signifies to receive, a Palm or 4 fingers breadth.
Tables of Ancient Coins,

It is likewise called Δακαλοδόχης in a compound word.

The Palm is likewise called Δακαλοδόχης, because a gift is made with the hands; so δίδωσιν, τετραδόχης, πενταδόχης, signifies a course of 2, 4, or 5 Palms. And so in Homer κυκλοειδές, horns of 16 Palms long. It is also called παλαιστής, Δακαλοδόχης, τετραπαλαιστής, πενταπαλαιστής. So that these four words δακαλοδόχης, δακαλοδόχης, δακαλοδόχης, παλαιστής signify the same thing. A Reader of ancient Authors ought to be advertized of this.

Δακαλοδόχης is a measure of 10 δακαλοδόχης or fingers, from the thumb to the long or middle finger.

Ογθόδοχης is the length of the hand, that is from the upper part to the extremity of the longest finger, is reckoned equal to 11 δακαλοδόχης.

Στυλαμής is the length of the hand extended, between the thumb and the little finger. It is reckoned equal to 1/4 of a Foot, or 12 Digits.

Strabo calls the Pigmies τετραπαλαιστής, which is wrong interpreted in Latin trium Palmorum homines, for it makes 3 Foot and 3 inches. According to Nicephorus, our Saviour was in the 34th year, that is 5 Grecian Feet and a Palm. Δακαλοδόχης according to Hesychius signifies the same thing with τετραπαλαιστής.

Πᾶς the foot according to Herodotus, mensura τετραπαλαιστής, that is of 4 Palms. According to Suidas ὁ πᾶς ἕξιν δακαλοδόχης ἑστι, that is, a foot has 16 Digits. It was likewise divided like a Roman foot into 12 Inches.

In the Reduction of this to English measure, we have supposed with the generality of Authors, that the Grecian Foot exceeded the Roman by a Roman half inch. Those tell you, that there is still at Rome a measure of 9 Greek Feet with the Inscription πολυν θ., that is 9 Feet, which agrees with this measure, being in proportion to the Roman Foot as 25 to 24. The Greek Foot of Pliny in Dr. Bernard is 1,0104 which exceeds that of the Tables by 1/45, or about 1/9 of an Inch. The learned Bishop often mention'd, supposes the Actis

b Iliad. 4. e Pollux lib. 2. αὶ δὲ μέγας ἀρχι- χελὸς ὀρθιστής. e Poll. ibid. ἐτὶ τῷ ἑα- τον τῷ λεγένθῳ γνωτίσθαι μετὰ προοίμων. a Poll. τούλιν ἀποστολήν ἀνὸν τῷ μεγάλῳ τοῖς ἐγκα-.

ibid. ὁ ἔστι καὶ χρονός ὅλος ἐκεῖνον ἐνάκτων ἡ πᾶσα ἡ τῶν μέγατον ἀνθρώπων.
Weights and Measures, &c.

A palm equal to ours, at least increasing of it by less than a part, will make the weight of water of an Attick cubical Palm about 7000 Grains, the weight of the Ancient Mina. The Greek Foot of 1,0104 will make the cubical Palm 7012 Grains. The Palm by the measure in the Tables makes it 6990. The Averdupois pound according to my measure is 6994, which differs only by 4 Grains, and consequently comes nearer to the Averdupois pound or ancient Attick Mina, which is justly suppos'd to be a cubical palm of water.

Some of the unusual stature of men according to the Ancients are as follows.

Plin. lib. 7. c. 2. tells of Pygmyes 3 Spithamae high, that is 2 Feet 2 Inches.

The same Author faith that there were many Indians above five Cubits high, or above 7 Feet 3 Inches. Herodot. lib. 9. and Arrianus lib. 3. talk of men of the same height.

Julius Capitolinus faith that the Emperor Maximinus was near 8 ½ Roman Feet high, that is near 8 Feet, 2 ½ Inches English. Erasmi. Cib. 1. 6. 21.

Herodot. lib. 7. faith that Artucneus a Persiam wanted only 4 Inches of being 5 Royal Cubits high, that is 8 Feet, 5 Inches. A Royal Cubit according to the same Author exceeds the Babylonish by 3 Inches: which therefore I suppose equal to 21 Inches. Goliath the Philistine was 6 ½ Cubits high, that is 12 Feet 4 Inches, reckoning Jewish Cubits.

Josephus lib. 18. cap. 8. ἰδέαν πλῆθος. faith Artabanus made a present of a Jew to Tiberius, whose height was seven Cubits, or 12 Feet 9 Inches.

Plin. lib. 7. c. 16. faith that Orestes was seven Cubits high, or 16 Feet 7 Inches, vix. Greek Cubits. Pliny lib. 7. c. 2. faith that the Syrboza a people of Ethiopia were above 8 Cubits high, that is above 11 Feet 7 Inches.

The Bed of Og King of Bashan was 9 Cubits long, that is 16 Feet 5 Inches, and 4 broad, that is 7 Feet 3 Inches. Deut. Chap. 3.
Tables of Ancient Coins,

Suidas faith that King Ganges was 10 Cubits high, or 1.5 Feet a Inch.

Homer Odyss. 2. faith that Otus and Ephialtes were 9 Cubits broad, and 36 Cubits high.

From πτες are derived ποδῶς, ἱπποδῶς, τετράδως, that is 1, 2, 3 Foot long. They used ἡμιπόδιον half a Foot, with the compounds of it, τετραπόδιον, πενταπόδιον, to signify 3 half Feet, or 1.5 Feet, and 5 half Feet or 2.5 Feet. Solomon fix’d boundaries of people’s grounds by the following measures; a hedge or a wall was to be distant one Foot from your neighbour’s ground; a house two Feet; a Sepulcher or a Ditch as much space as they were deep; an Olive and a Fig-tree nine Feet, and all other Trees five. This was copied in the Laws of the XII Tables with very little alteration.

The walls of Nina, or Nineveh were 100 Foot high, and the Towers 200.

Πήχες a Cubit contains one Foot and a half. Hesychius ἐξαμαλαισκός according to Herodotus, or of 6 Palms, which give the same proportion. The print of Hercules’s foot was δυτήρυ or two Cubits long, in English measure about 2 Foot 3 Inches. This was to be seen, as Herodotus faith, in a rock in Scythia.

Πυγῶν was the measure from the Elbow to the second joint of the Fingers, or a Cubit with the fingers inflected: it was a fifth part shorter than the Cubit, and consisted only of 20 digits. Xenophon and Herodotus make use of this measure.

Πυγμὴ was the measure from the Elbow with the Fingers quite clapt, and consisted of 18 digits. Eustathius tells you, the Pygmies have their name from this measure.

Ὀργια from ὀργεῖν to extend, according to Herodotus, it is ἐπτεσιονυμεν or four Cubits, and ἔξαπωδες or six Feet. According to Columella it is 6 Greek Feet. Pliny expresses it by Uima, as may
Weights and Measures, &c.

may be seen in the chapter of Roman measures. He translates πυργίς τεσσαρακοστόγυνος, pyramis quadragenarum ulna-rum.

The Pillars of the Cyzicenian Temple were in circumference four Ulna or Όγνυαί, and 50 Cubits high, all of one Stone.

The Circumference of the Pillars of Herod's Temple was 3 Όγνυαί.

Strabo tells you of vines in Margiana, in circumference at the root, of the Όγνυαί of two men.

Hesychius mentions γύνη a measure equal to the Όγνυαί.

Πλέθγην or πίλεθγην is a measure of 100 Foot according to Suidas, ἐχει πόδας ρ'. In the Epitome of Strabo, it is reckoned ἐκείνης τοῦ σάδιω, the 6th part of a Stadium.

From πλέθγην comes πλήθεμα, an adjective signifying a hundred feet long; as in Herodotus, φοινικάς πλήθεμας Palm Trees 100 feet long, which he faith grew in Babylon. And Strabo mentions a Dragon about that length.

Πλέθγην also signifies a Jugerum or Roman Acre. Hesychius saith, μέτρην γυν', ὅ εἰς πλέθγην, i.e. a measure of land. Plutarch in the life of Camillus calls πλέθγην, what Livy calls Jugerum. So Laurentius Valla translates it from Herodotus.

'Αγάμη, according to Suidas, is a measure of 50 Feet. And it signifies likewise a field, or manured ground.

Σταδίων, according to Herodotus, lib. 2. is a measure equal to 100 Όγνυαί, or of 600 Grecian Feet. The same Author saith it is 400 Cubits, which is the same thing. From σάδιων comes σαδιών, in Strabo πυργίδες τοῦ υψος σαδιών, signify Pyramids of the height of a Stadium, or 600 Feet.

The City Nineveh, which in the Scripture is called Nineveh, was in Circumference 480 Stadia, according to Diodorus Siculus: which comes near to 55 English Miles, reckoning 600 Grecian Feet to a Stadium. The same was the circumference of Babylon. Strabo lib. 16. saith that Belus's Sepulcher was a Stadium in height, and in other every dimension; which if true, it far exceeded the greatest of the Egyptian Pyramids.
Tables of Ancient Coins,

Στάδιον by the ancient Greeks was called δίολος, from whence came διαλός, a space of two Stadia.

Ὑπικόῳ στάδιον is reckon'd 4 Stadia by Plutarch in the life of Solon. And Hesychius saith, ἑπτάδες ἓξυμος τετρασέκατος τις. i.e. a horse's course of four Stadia.

Mίλιον a Mile, was taken from the Latin Mille. It contain'd 8 Stadia. Suidas saith, τὰ δικαμίλα ἑκατὸν τὰ δίδακτος. i.e. 10 Miles has 80 Stadia. Some reckon'd it more than 8 Stadia.

Jewish Measures of Length, &c.

The Jewish Measures of Length for the first period are somewhat uncertain, and in a matter so obscure, one must follow common opinions. The Cubit in the Tables formerly published is that of Dr. Cumberland late Bishop of Peterborough, who himself follows that of Rabbi Godoliah. This Rabbi, as the learned Dr. Hooper saith, is supposed to speak the mind of Maimonides, one of the most knowing and learned of their Writers.

Accordingly I have stated the measure of the Jewish Cubit or Amnab to be 21,888 Inches English; which is the length of the present Cairo Cubit. This depends on the proof of two Propositions; First, that the present Cubit of Egypt is the same with the ancient. Secondly, that the Jewish Cubit was the same with the ancient Egyptian Cubit; the proofs of which, according to Bishop Cumberland, are as follow.

That the inhabitants of Egypt have always made use of the same Cubit, is inferred from the following reasons. First, That there is no intimation in history of any such change of their measure. Secondly, that the Nilometreim or Column divided into Egyptian Cubits to measure the increase of the height of the Nile, is supposed by most Authors to have continued the same, ever since Joseph's Regency. That a certain height of 16 Cubits (according to Herodotus and other writers) was necessary to produce the com-
Weights and Measures, &c.

mon fertility of the Soil, and by this the people judg’d of the future Crop. For such a natural reason the government would not, and the people neither would nor could, change the Standard measure.

Secondly, The Nile by its annual overflowing sometimes confounding the boundaries of people’s properties, it was necessary to have a stated Measure of length to set them out again. Of this Bishop Cumberland gives an Example in the land assign’d to the Militia, as follows.

"The strength of this reason may be understood more clearly by help of an Example in Herodotus his Euterpe. There he tells that in Egypt their settled Militia consisted of these two sorts of Soldiers, who were esteemed above all Tradesmen, the Hermesymachia, and the Calasries. The full number of the later of these was 25000 Men, who in courses were their King’s Guards, and every one of them had to maintain him and his family Land, (free from Taxes) whose Area, or superficial content, was 12 Aroura, each Aroura being 100 Cubits on every Side; which imports that it was the Square of 100 Cubits. Wherefore to know how much land this was in our measure, I took the Cairo Cubit an hundred times, which is 182,4 in our foot measure, as may be infer’d from Mr. Greaves his Table: and by squaring this number, I find an Aroura to be 33269.76 square Feet. Which is considerably less than one English Acre, for that contains 43560 square Feet. Hence it will follow that 12 Aroura will amount to 39923.12 square Feet. And this divided by the feet of an English Acre, will quote 9,165, which demonstrates that the Land of each Calasry amounted to 9 English Acres, and 165 Milleimials of an Acre, or 1 tenth of an Acre, 6 Cents, &c. above the 9 entire Acres: And it’s clear, that so much good land lying where he places it, might maintain any of them with his Family very well. A Cubit shorter than the Standard, men of their character would not bear; a longer must either make a Mutiny among themselves, vix.
Tables of Ancient Coins,

viz. amongst those who were last served; or a Sedition among the people.

This is a plausible argument; however it is not to be imagin’d that after every overflow of the Nile, there was always a menstruation, but such a thing might be necessary sometimes.

Thirdly, The Nation who conquer’d Egypt, could not have introduced their measures; for the Babylonian Cubit of 5 Palms is much shorter, and so is the Roman and Greek; and the Turkish Pike, which is deriv’d from πηνευσ, is much longer than this Cairo Cubit.

Another presumption arises from the Dimensions of the greatest Pyramid, which measur’d by this Cubit falls into round numbers, as it may be suppos’d an Architect would chuse in setting out the plan of a stately building, rather than such as end in Fractions.

“The sides of the Base of the great Pyramid are delivered, p. 68, of Mr. Greaves’s Pyramidographia, to be 693 English Feet. For Reduction, these must be divided by 1,844, which is his length of the Cairo Cubit in our Foot measure, the quote is 379,934, which is so very little short of 380 Cairo Cubits, that I think it reasonable to believe that the old Architects design’d just this even number of Egyptian Cubits. For if we suppose Mr. Greaves to have missed but 1/2 of a foot, which is not one Inch and an half, in taking this long measure of near 700 feet, then the Side must be put 693,12: this number divided 1,824, will give precisely 380.

“In like manner I rememberd, that Greaves, p. 96, 97, gives the length of the exterior Surface of the Tomb, contain’d in the midst of the greatest Pyramid, to be in our Foot measure 7,296. This reduced into Cairo Cubits, by dividing by 1,842, gives just four such Cubits.

I cannot admit of this Argument of the Bishop’s, at least of the inference which he draws from it. For a shorter Cubit will bring out the dimensions of the great Pyramid and its parts in round numbers, with better analogy than the Cubit of 21888 Inches.

He
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He finds the side of the Base to consist of 380 such Cubits, and that of a Tombstone of four, nearly. Mr. Greaves has given the dimensions of so many parts of the Pyramid, that any Cubit whatsoever would probably answer to one or two of them nearly in Integers. So the Strength of the Bishop's argument depends chiefly on 380 being a remarkable number, such as an Architect would choose for the dimension of the Principal part of his Fabrick. But why it should be thought so remarkable for its Square 144400, does not appear, or even so fit for the Side of the Pyramid, is not so obvious, since it consists of 300 and 80 over. I will suppose rather that the Architect choose 400 Cubits for the Side of the Base; this is properly a round number, and the Cubit from thence deduced will be found to agree better with the other Dimensions than the present Cairo Cubit.

Divide 693 the number of feet by 400, the quotient will give the ancient Egyptian Cubit equal to 1.7325 Feet: which is shorter than the Bishop's: and is compared as follows with some of the most remarkable dimensions. Mr. Greaves mentions three Square holes, each in breadth exactly 3.463 Feet: this number divided by the Cubit 1.7325 quotes 1.9988, this differs only 1.2 ten thousandth parts from 2, which therefore I suppose was the number of Cubits' design'd. Now dividing that number 3.463 by the Bishop's Cubit 1.824, the quotient 1.898 differs above 1 tenth from 2.

The Breadth of a Gallery in the Pyramid is 6.87 Feet, which divided by 1.7325 gives 3.96, which differs from 2 but by 4 hundredth parts: but being divided by 1.824 gives 3.76, which differs 2.4 hundredth parts from 4 Cubits.

The Breadth of two Banks of polish'd stone is 1.717 Feet. The difference of this from 1.7325 is about 1.5 thousandth parts, but difference from 1.824 is one tenth of a Foot.

The Breadth of a Way between those banks is 3.436, which differs from the double of 1.7325, or 3.465 by 3 hundredth parts of...
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of a Foot; it's difference from the Cairo Cubit doubled is above six times as much.

Mr. Greaves tells us the length of a Marble Chamber is 34.38 Feet, and its breadth the half of that: which answer to 20 and 10 Cubits: supposing the Cubit 1.7325.

These Measures agree as well with this Cubit as our own Measures now-a-days in buildings agree with our Foot.

According to this supposition the old Egyptian Cubit is equal to 1.7325 Feet English, or 20.79 Inches. And that this was the Cubit then in use among the Egyptians when the great Pyramid was built, seems to be pretty plain from what has been said above. It is to the present Cairo Cubit as 19 to 20.

According to the Isagoge of Heron, the Royal Egyptian or the Philetaraen Foot was to the Roman Foot in the proportion of 6 to 5; and therefore the Cubit was in the same proportion to the Roman, or equal to 20.8872 Inches, which differs from that found by the Pyramid less than 1/8 of an Inch. This is a great confirmation of the measure of the Cubit drawn from the Pyramid as above. But Bishop Cumberland being an Author on this Subject of great Esteem, I have set down Tables calculated according to his Hypothetis. At the same time I chuse rather to recommend the other from the Egyptian Cubit of 20.79 Inches English, computed in Decimals.

The second Proposition, that the Jews used the Egyptian Measures, seems, if not evident, at least extremely probable for these reasons.

They had been in that Country in a state of Slavety for about 200 years, and consequently in all appearance had no Measures of their own. Moses when he speaks to them of Measures, to be sure talks in a Style that was intelligible. When he speaks for example of an Ephah, he presumes they knew what Measure he meant. That he himself was skilled in Weights and Measures, Arithmetick and Geometry, there is no reason to doubt: besides, those of the Egyptians were adjusted by the Authority of their first King Mizraim.
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Mizraim, who receiv'd them from his Predecessors Ham and Noah, from whom Abraham's family had them likewise. From Noah to Joseph's promotion, there were but 283 years: and Joseph in his Regency is supposed to have set up the Nilometer, which is divided into Cubits of Measure abovementioned.

It is probable the Measures as well as the Weights continued the same. But the word Shekel is used in this Period indifferently, which if it had signified different Weights, must have been equivocal.

The Division of the Jewish Cubit into 6 Palms after the manner of the Egyptians, is another probable argument of the identity of those Measures. And as for different Cubits, the Bishop thinks there seems to be no foundation for them in Scripture; where there is a different Cubit mention'd, it is specified, as the bed of Og is measure'd by the Cubit of a Man, not the Standard Cubit.

The other two places that intimate some difference of Cubits, are in Ezek. xli. 5. and xliii. 13. "Now he writing while he he was a Captive in Babylon, must be thought to have observed that Measure differing from the Jewish Standard, was there often used, even by the Jews also, who must use the Measures allowed in the Kingdom where they live; and therefore being to give them the Measures of the future Temple, he was obliged to intimate that the Cubits whereby they were expressed, were not such as in this foreign Kingdom they often used, but longer by one hand's breadth.

Another Argument is, that the Eastern people determin'd their Digit, and consequently their Hand-breath, by the Breadth of Barley Corns, 6 making 1 Digit, and 24 a Hand-breath: six such Grains will make 912, of an Inch at a middle rate, a small matter over or under, which according to the stated proportion will produce the Cubit above-mentioned 21.888 Inches. The Greeks and Romans fall short of this Measure, by fixing that of their Cubit and Foot first, and then subdividing it.

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In Ezek. xliii. 13. parallel to xl. 5. the dimensions of an Altar are described by a Cubit an Hand-breath longer than that of the Babylonians, where they were Captives, from whence it follows that a Hand-breath was a known Measure. Secondly, this was to lead them to their own Measure, which was bigger than the Babylonian, consisting of 5 Palms, whereas the Jewish consisted of 6.

To prove this, the Bishop quotes a passage from Mijne Chilaim cap. 17. cited by Arias Montanus, who says that there were two Standard Cubits kept at Susa, one of 5 Cubits, the other of 6. Herodotus in his Clio, desiring the height of the walls of Babylon, makes the same distinction between two sorts of Cubits, he faith they were 200 Cubits high, Royal Cubits were 3 Finger’s Breadth (\(\delta\alpha\iota\nu\iota\iota\iota\nu\iota\iota\iota\) perhaps Inches) longer than the common Cubit.

By comparing the Measure of the outward Wall of the Temple in Josephus with the Jewish Stadium of 400 Cubits, and that of the Talmudists by the Roman Measure of 500 Cubits; Jacobus Capitolus infers, that the Jewish Cubit was to the Roman as 5 to 4.

On the other hand, it is own’d that Josephus supposes the Jewish Cubit equal to the Attick, and differs from the Rabbins in this particular as in the value of their Coins. Abulfed an Eastern Prince, King of Hamath, a City and Territory near Judea, and exceeding curious in Weights and Measures, affirms (as quoted by Kircher) that the Jewish legal Cubit was equal to the Egyptian of 24 Digits.

Rabbi Gedaliah compares the Jewish Cubit with the Bolognian Ell, from whose very unaccurate calculation the Bishop makes the length of the Jewish Cubit to be 21.735 Inches, differing from his not much above 1/ of an Inch.

Another argument is drawn from Conveniency. According to this Measure the height of the Table of Shew-bread, viz. 1 1/4 Cubit, will be 32.832 Inches. According to the old Roman Cubit, it’s height will be only 26.109 Inches; too low for a Table.

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The capacity of the Ark according to a Cubit of 18 Inches will be little more than half of what it is by this Cubit of 21,888 Inches.

These Arguments of Bishop Cumberland, for the Jews having had only one Cubit, and that of 21,888 Inches I submit to the Reader; but to me it seems plain, that they used two sorts of Cubits, the sacred one, and the profane or common one. For (Deut. iii. 11.) the Bed of Og is said to have been 9 Cubits long and 4 Cubits broad, after the Cubit of a Man. And (Ezek. xl. 5.) Ezekiel’s Reed is said to be 6 Cubits long, by the Cubit and Hand breadth. From whence it appears that the larger Cubit by which the Reed was measured, was longer than the common one, by a Hand-breath or 3 Inches. Agreeably to this, Herodotus, speaking of the walls of Babylon, saith they were 50 Royal Cubits broad, and 200 high; and then he adds that the Royal Cubit was longer than the ordinary one, by 3 δακτύλιοι, which being understood of Inches, this account of the Royal Babylonian Cubit agrees with that of the sacred one in Ezekiel.

It’s agreed by all Authors that the common Cubit was 6 Hand-breaths or 18 Inches, consequently the sacred one was 7 Hand-breaths or 21 Inches. Accordingly we find the great Cubit deduced from the Pyramid, differing from 21 English Inches only by 21 Hundred parts of an Inch. And if it’s 7th part be subtracted from it, that is, 2.97 from 20.79, there will remain 17.82 Inches equal to the profane Cubit; and differing from ours of 18 Inches by 12 hundred parts of an Inch. And it is undoubtedly this shorter Cubit of the Jews which Josephus makes equal to the Grecian, the difference being but ¼ of an Inch. In the Decimal Table the subdivisions of the Cubit, viz. the Span, the Palm and Digit are deduced according to the known proportions from the shorter Cubit 17.82 Inches, and the greater Measures are reckon’d according to the sacred one: altho’ it is uncertain whether the sacred or the profane were most commonly us’d among the Jews. Besides the Amman or Cubit, the Hebrews had two other Measures taken from

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the parts of a human body. Topbath, the 6th of a Cubit:
which is interpreted by the LXX always a Palm.

b Zereth, half a Cubit, which the LXX render αὐθαμία: a Span.
Josephus puts 2 αὐθαμίας or Spans for one Cubit.

The Stature of Goliath was 6 Éemoth and a Zereth, the LXX render it εἴς πύχεων καὶ αὐθαμίας, that is 6 Cubits and a Span, according to English Measure 11 Feet 10 Inches.

c There is likewise another word ֶוֹאְחָדַד, which the LXX render αὐθαμίας.

d Kaneh, from whence perhaps the Latin word Canna, is translated by the LXX καγκάριος, a measuring Rod, supposed to be of 6 Cubits long.

e Pathil and Chebel, it is translated by the LXX γεωνίον γεωνεξον, Scheremus, a measuring line, supposed to be of 80 Cubits.

f Their Mile they had from the Romans. Berath is commonly interpreted a Mile.

The Parasang is a Persian Measure consisting of 30 Stadia.

Their Sabbath Day’s journey, supposed to be equal to the Space between the Ark of the Covenant and the camp of the Israelites, 2000 Cubits; so long a journey was allowed to those that went to worship. Origin makes it amount to 3000 Cubits.

A day’s journey is an uncertain Measure among all the Ancients, sometimes of 20 Italian Miles, as in the Civil Law de excusatione tutela. It is reckon’d by Herodotus 200 Stadia, or near 19 Miles.

The same Author speaking of the mansions of the Persian Monarchs, faith they travell’d 150 Stadia a day, that is about 17 Miles. There are 8 instances of very long days journeys. Julius Caesar used to travel commonly 100 Roman Miles in a day.

Curio travell’d with Caesar’s letters 3300 Stadia in three Days, that is 377 Miles English.

There

a Psalm. 39. 1 Kings 7. Ezek. 40, 43.
b Exod. 28, 39. 1 Sam. 17. Ezek. 43. Matthew 40.
c Judges 3. d Ezek. 40. e Zachar. 2.
d Genesis 35, 47. & 48. e Herodot. lib. 6. f Suet. in Cæsare. Centena passuum millia in singulos dies. Rheda nescit hominem expedite consulere solitus est. g Appianus. lib. 2. h Bellor. Civil.
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There are several long Days Journeys mention'd by Pliny, as prodigies of quick travelling. As of Anistis a Lacedemonian Runner, and Philonides one of Alexander's, who ran 1200 Stadia from Sicyon to Elis in one day, that is 137 Miles.

Tiberius Nero travelled with 3 Chaise in one day and one night a journey of 200 Miles, to see his brother when he was sick.

The Ancients us'd Calches, the figures of several of them are to be seen on ancient monuments. They are very simple, light, and drove by the Traveller himself.

The day's sailing of a Ship assign'd by Herodotus is 700 Stadia, i.e. 84½ English Miles. And for the Night 500, or 70½ Miles making in 24 hours 155 English Miles; seems too long.

The voyage of Solomon's Fleet, which was sent to Tharsis for Gold, was Triennial, from which instances it seems their Merchant Ships were slow Sailors; and indeed they were of a most inconvenient figure for it, being round or oval.

Now we are upon the subject of travelling, it may not be improper to say something of their Highways and Bridges; and to apply the Tables in some particulars of that kind.

Their Highways, for their extent, solidity or expensiveness, are some of the greatest monuments of the grandeur of their Empire. Their Center was the first stone or the Miliare Aureum in the middle of Rome, from whence they branch'd themselves out to the utmost limits of the Empire. The Appian way about 2000 years old continues in many places entire for several miles near Fonde; which is not to be wonder'd at, considering the manner of the workmanship. Montfaucon tells you that he observ'd part of it where the stones above were removed between Velletri and Sermonetta; which gave him an opportunity to consider the manner of the structure; the foundation was made of rough stone join'd together with a most firm Cement: upon this there was laid another layer,

L 2

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1. Tiberius Neronem nocte ac die longissimum iter tribus vehiculis emensum, fistinanatem ad Drutum fratrem agrotantem in Germania.
2. Vide Montfaucon Tom. 4.
3. Lib. 4.
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consisting of small stones and Cement, to plane as it were the inequalities of the lower Stratum or rough stone, in which the stones of the upper pavement were fixt. This was an excellent contrivance, for there can be no very durable pavement but a double one. The thickness of the whole structure was about 3 Parisian Feet, or 3 Feet 2¼ Inches English.

In some places their highways had borders for foot passengers about 2 Foot wide, and 1 Foot high. They were so rais'd, perhaps for the conveniency of people dismounted to get on horseback, which was sometimes necessary before the use of stirrups. The breadth of such a way was between the borders about 14 Feet, a space sufficient to let two Chariots pass; the concourse of many of them at a time not being so common in these Days. Such was the structure of the ways of Italy. In other Countries, as particularly in that part of Gallia called Belgica, they were larger, and made after the following manner. There was a Ditch drawn between two parallel Furrows, which was filled with some sound materials, and ramm'd to make the foundation solid, and rais'd so high in marshy places that the waters could never cover them, sometimes to the height of 20 Feet. The ways were made of several layers of flat stones and flint cemented so strongly, that Ages have not been able to break or disjoint them. The construction was a little various, according to the nature of the Soil or the Materials which they found.

There were likewise Inns built at proper distances to receive Travellers. I could not forbear mentioning these particulars, tho' not directly relating to the subject. It is one of the greatest concerns of Government to make their people easy and secure upon the roads, and this is still more necessary in a trading Nation. And the expence that is laid out in strength and solidity is frugality.

The Roman Bridges were no less wonderful than their highways. Some of them have been repair'd and are yet standing; and the remains of the others shew the magnificence of their structure: for example,
example, that of Narni between Loretto and Rome, supposed to be built by Augustus. It joins two mountains, between which the Narni runs. The Bridge consisting of four arches, is of the length of 636 modern Roman Feet, or 583 Parisian, that is 622½ English: The dimensions of the arches are as follows, in English Measure: The height of the first Arch 109 Feet, the distance between the Piers 72½ Feet. In the second Arch the distance of the Piers is 130 Feet. In the third their distance is 109 Feet. In the fourth the distance is 138 Feet.

The description of Trajan's Bridge over the Danube does not answer the figure of it upon his Pillar, if it be the same. According to Dio this Bridge had 20 Piers of square stone, 150 Feet high above the foundation, and 60 Feet broad, distant and joined with Arches of 170 Feet; and what makes the work the more wonderful, is the owzy bottom, and the impetuous stream of the River, because of the comparative narrowness of it in that place; besides there was no other channel could be cut to divert the River till the Bridge was built.

A description of a very wonderful Bridge of Julius Caesar's over the Rhine is to be seen in his own Commentaries, but Architects differ widely in the figures which they have given from that description.

Pons Vardi, commonly called Pont du Gard, three Leagues from Nismes, is another instance of the Roman elegance and magnificence; it consists of three orders of Arches: the inferior Piers are continued upward, and support the others, leaving a free passage for Travellers. The inferior Arches are six, the second Row eleven, the highest being but small, are 35. This height was necessary, because the Bridge serves likewise for an Aqueduct. The lower Row of Arches takes up the space of 438 feet, the second of 746, and the third 805. The whole height of the Bridge is 182 Feet. It is built of stones compacted together with Iron.

The Bridge of the old Brioud in Auvergne, mention'd by Montfaucon, consists only of one Arch, which from one Piere to the other
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other is 195 Feet: from the top of the Bridge to the water are 84 Feet.

The Bridge of Alcantara in Spain upon the Tagus, built in the reign of the Emperor Trajan, is in length 670 Feet, consisting of 6 Arches of the breadth of 84 Feet. The Piers are square, about 28 Feet wide. The Bridge is 28 Feet broad, and 200 Feet high.

They had likewise the art of making Bridges of Boats. But this by the way.

But to return to our Subject, viz. Measures of distances or lines, of which Time may be reckon'd one. Amongst the Romans when the hora was called the integer, it was divided into 12 parts like the As. A Reader not attending to this, would find it very hard to explain the following passages in Pliny lib. 2. cap. 14. Lunnam semper aversis a sole cornibus, si crescat, ortus spectare: si minuat, occasus, haud dubium est. Lucere dobro antes semnuncias horarum ab secunda adjacentem usque ad plenum orbem, detractentemque in diminutionem. Intra quatuordecem autem partes semper occultant esse.

Drodans is of an hour, Seminuncia is part, both together make of an hour: and the sense is, that the Moon when she begins to appear after the Novilunium, shines of an hour, and proceeds adding still every night the same quantity of time for the duration of her shining to the full Moon, and then the time of her light decreases in the same proportion.

Plin. lib. 8. cap. 32. Speaking of the Moon, In coitu vero quod Interlunium vocant, cum apparere desiderit, supra Terram autem erit quam diu & Sol; interlunio & prima tota die, secunda bore noctis unus dextante Sicilico: ac deinde tertia usque ad quintam decimam, multiplicatis horarum iisdem portionibus: quintadecim tota supra Terras noctu erit, cedentem sub terris tota die; decima sexta ad primae bore nocturnae sextantem Sicilicum sub terra agit, ejusdemque portiones horarum per singulos dies adjicit usque ad interlunium, & quantum primis partibus noctis detraxerit quod sub terris agat, tantundem novilunis ex die adjicet super terram.

Which
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Which passage is easily understood, when the Reader remembers that the dextans bora is 10 Ounces, or 1 of an hour: and that a Siculus 1/3 of an Ounce or 1/4 of an Hour. So that the whole time makes 1/2 of an Hour. This is the sense of these passages, without entering into the Astronomy of them.

The Romans divided their natural day into the following parts.

The first they called Media noctis inclinatio.
Second, Gallicinium, or Cock-crow.
Third, Conticinium, or when the Cocks left off crowing.
Fourth, Diluculum, or Day-break.
Fifth, Mane, when it grew clear,
Sixth, From the Morning to Noon.
Seventh, Tempus occiduum, or Afternoon, which is sometimes called suprema tempestas, which ended at Sun-setting.
Eighth, Vespera, so called from Hesperus the Evening-star.
Ninth, prima fax,
Tenth, Concubia.
Eleventh, Intempesta, because it was a time unfit for business.

The Ancients likewise divided their night into four parts, called φυλακοε, vigilie, Watches, often mention’d in the New Testament. In the Roman Camps they were called Vigiliae Castrenses; they must have been unequal, according to the inequality of the Nights.

C H A P.
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CHAP. IX.

Of Measures of Capacity.

ROMAN.

The Romans have given the proportions of their Measures of Length, Measures of Capacity, and Weights, so exactly, that one being given it is easy to determine the other two. Thus from the Pes being known, the Congius is determin'd, because the Amphora, which contain'd 8 Congii, was the Cube of a Pes or Foot. The Congius it self the Cube of half a Foot. So that it is plain the quantity of the Amphora or Congius being given, that of the Root or Side must be so likewise. The weight of Rain-water contain'd in a Congius was 10 Roman pounds, and that of the Amphora 80: so that from the Measure of the Congius or Amphora, the quantity of their Pound, Ounce or Denarius is likewise known. But it happens from the want of accurateness in experiments, or perhaps even in the first original framer of these models, that in comparing the Measures of Lengths and Capacity and Weights together, and assuming one as the Standard, the others will come out with some small difference.

The Pes already settled is equal to 11,604 Inches, its Cube 15625112 gives the content of the Amphora in solid Inches; and divided by 8 gives 1593139 Inches for that of the Congius.

According to the Experiment of Villapandus, the Congius of Vespasian weighs in water 52560 Grains Troy. In order to reduce this to solid Inches, it's known by experiment that a Cubical English Foot of Rain-water weighs exactly 76 pounds Troy: or reducing the foot to Inches, and the Pound to Grains, 1728 solid Inches weigh

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76,5760 Grains, which numbers being divided by their common Divisor 576, it appears that 3 solid Inches of Rain water weigh 760 Grains Troy. Hence the weight of the Congius being 52560 Grains, its content is found by the following proportion; As 760 Grains are to 52560 Grains, so are 3 solid Inches to 2074737 the content of the Congius in solid Inches; which exceeds that deduced from the Pes by 12,1598; and would make the Foot 11.84 Inches, differing from that in the Tables near one fifth of an Inch, which makes a great difference in the Cubes. But as the learned Bishop, so often quoted, observes, the Romans in all appearance began their concave Measure not from any length before established, but rather from the Weight of the contain'd liquor, by which those vessels are also describ'd. For had they primarily erected the Cube of a Foot for their principal Conclave, and then Geometrically taken its Suboctave the Congius; from the Cube of half a Foot, they would not have fail'd to proceed lower in like manner, and to divide the Congius into 8 parts instead of Six, each of which lesser Measures, would have been regularly the Cube of a quarter Foot, their well known Palm. This is the course that has been taken for our Gallon, which comes in the place of a Congius, and has the Pint for its Suboctave. This consideration may well serve to prove that the Cubical relation of the Amphora to a Foot, and of a Congius to half a Foot was incidental only, and not primarily designed, tho' afterwards the Amphora was describ'd by their Authors by the length of the side of the Cube. As by Rhenius Fannius thus;

PES lango, spatio latoque subtur in anglo,

Angulis ut, par sit, quem Claudius linae triplex,

Quatuor ex quodis medium cingatur imane,

Amphora sit Cubus.

which is thus to be interpreted, Amphora sic formatur, ut ejus capacitas lineas quatuor habeat rectas aquales, pedem longas, quatuor angulis.
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lo, velis, in quarto, quonque in eis, lineas longas, latae et aliae conveniunt. Efficacem qua figura quadraturae, quam scripsi, illa brevi, et eis Cabum non suae.

Therefore, preserving the Antiquity of the Congius, with the weight of the Roman Pound already settled, at 3,416, a Grains Troy, which multiplied by 3, produces 52,447; Grains, the weight of the Congius; this multiplied by 9, and divided by 760, gives 207,0676 solid Inches, which is the content of the Congius in the Tables; and differs from the capacity arising from Villalpandus's experiment by less than half a solid Inch. Experiments of weighing water are very nice; the same quantity of water in the Winter weighed 474 Grains, in the Summer only 470, according to a Tryal of Mr. Howbrig's.

A vessel holding the 6th part of a Congius, or third of a Roman Pound, i.e. 40 Ounces, was the Sextarius; the half of that a Hexima; the quarter of 5 Ounces, a quartarius; and the 12th a Cytthus; according to the distribution of Volumnus Metianus a celebrated Lawyer, with whom the more ancient Authors likewise agree. I must not here omit the proof of the proportions above-mentioned, which is plain from the following plebiscitum of the two Silius printed in Graecæs, and to be seen in the best editions of Sentus Pompeius de fig. verb.

VII. QUADRANTAL VINI. OCTOGINTA. PONDO SIET.
CONGIVS. VINI. DECEM. IS. SIET.
SEX. SEXTARIUS. CONGIVS. SIET. VINI.DVO. DE. QVINQAGINTA. SEXTARIUS.
QUADRANTAL. SIET. VINI.
SEXTARIUS. AQVVS. AEO. VO. CVM LIBRARIO. SIET.

The Congius of Vespasian still extant, is marked with the following letters P. X., which denote Pondo Decem.
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The greatest Measure among the Romans of liquid things was the Culeus, or Culeus containing 10 Amphora. When, saith he, oftentimes each Acre will yield seven Culei of wine, that is 140 Amphora. A Culeus likewise contains 40 Roman Urns, an Urn being the half of the Amphora.

Columella lib. 3. cap. 3. reckons the Culeus of Wine at the Vineyard worth 300 Nummi or 75 Denarii, that is according to English rate 143 Gallons, 3½ Pints, for 2½ August, which is about a half Penny the Pint.

The Culeus likewise contain'd 160 Congii, or 960 Sexarii. We read of Dolia Culearia and Sesquiculaeria. Dolia Sesquiculaeria must have been very large, being about 3½ Hogsheads, and so therefore larger than our Pipes. ¹Culeus signifies sometimes a Leather Sack.

Amphora is a Greek word ἀμφορά, Iliad. 23. Odyss. 9. by a Syncope ἀμφόρα, it is so called from the two Anse or handles for carriage. It is the 19th part of the Culeus, as we said before.

Quadrans signifies the same thing as Amphora, so called, as Festus Pompeius saith, from the content of it; being the Square, as he calls it, or rather the Cube of a Foot. Quadrans vocabant antiquissimum ex Græco Amphora basin dicunt, quod erat pedis quadrati, quadrangula ad sextarias capit.

Ceramium, κεραμιον, signified also an Amphora, so called as being a Vessel of common ware. Digest. lib. 5.

Cudus was another word for Amphora, used by Columella. It was sometimes likewise called μεστερια ἱταλικας, to distinguish it from M a.

¹ Quando & postes sepe numero septenos culeos singula jugera, hoc est, amphoras centenas quadragesimas multi dedere. ² l. 43. de Pignor. lit. Titus pecuniam mutam accepit a C. Seio (sub Pignore Culleosum: illos) Culeos cum Seius in horrore taberet, missus ex officio sanocet, donaturio culeos ad Annonam transtulit. ³ Si in vetustatem servare volueris, cado duarum urinarum quam optimi vini Sex- tariam addito.
Table of Ancient Coins,

the Atticus. Dioscor. lib. 5. cap. de vino Scillisticum. There was a Model of the Amphora kept in the Capitol dedicated to Jupiter, called the Amphora Capitolina. Rhem. Fannius,

———Quam ne violare liceret ;
Saeravere Jovi Tarpeio in monte Quirites.

Cato de re rustica cap. 57. speaking of the allowance of wine for a family, makes it 10 Quadransalia or Amphora per man 2. year, that is about 71 Gallons, 8 Pints ; which is above a Pint and a half a day.

Urna, ab urinando, according to Varro, quod in aqua lavrienda urinas, hoc est mergetur ut urin migration. It is the 40th part of the Calesus, and the half of the Amphora; Columella lib. 3. cap. 3. Volusius Marianus. Columella ibid. speaks of Vineyards that yielded 600 Urnae the Jugerum : this is at the rate of above 544 Hogsheads to one of our Acres.

Congius was the 8th part of the Amphora, and 4th of the Urna; it held 6 Sextaria ; which were therefore so called according to Cato and Galen. The Congius in English Measure contains 207,0676 solid Inches, that is 7 Pinters, 4942 solid Inches.

Pliny lib. 14. cap. 22. relates how Tergilla objected to Cicero’s son, that he was used to drink two Congii of Wine at a draught, for which he was called Bicongius: two Congii make above seven Quarts. The same Author tells you that Novellius Torquatus a Milanese in presence of the Emperor Tiberius drank off at once three Congii, or 2 Gallons, 6 Pints, from whence he was called Tricongius: which are incredible stories.

* Cato during the time of the Saturnalia and Compitalia allowed each of his Servants per day a Congius of Wine, or 7 Pints, 4942 Inches.

Narratur & prisci Catonis
Saepn metu calcuisse virtus.

Hor.

From

*Cato de re rustica cap. 57. Saturnalibus & Compitalibus in angulos homines Congios.
Weights and Measures, &c.

From Congius comes Congiarium, which signifies a gift that the Emperors and Magistrates of Rome used to give to their friends, or to the people on certain occasions: it was so called because at first a Congius of Wine or Oyl was given to every one: the same name remain'd after, when those gifts were given in money: whereof there are several instances in this Book. Ancus Martius gave 6000 Modia of Salt, or 188 Quarters, 5 Pecks, as a Congiarium to the people.

Pliny lib. 14. c. 14. writes that when Lucullus return'd from Asia, millia caudorum congiarium divisi amplius centum, Budes teads congiariorum for congiarium, and thinks that caudorum congiariorum signifies Cadi of the capacity of a Congius, or six Sextarii. But G. Agricola understands Congiarium Cadorum; a Congiary of so many Cadi, which Lucullus distributed among the people, taking Cadus for a certain Measure of it self.

Quintilian tells that Augustus's Congiaria, for their smallness were called Heminaria, alluding to the measure Hemia, which is one twelfth of the Congius; but this cannot be understood of all of them.

The gifts of the Emperors to the Soldiers were called Donativa. Suetonius talking of Nero, saith, Populo congiarium, militi donativa propofuit. At the Triumph of Metellus, Wine was sold for an As the Congius, which comes to little more than 3. farthings the Gallon.

From Congius comes congialis, used by Plautus: as Fidelia Congialis: it signifies a vessel holding a Congius.

Sextarius was a Measure not only of liquid, but of dry things. There was a Sextarius Castrénis, as well as Urbicus, of a different Measure.

The Sextarius Urbicus for Liquids was the 48th part of the Amphora, the 24th of the Urna, the 6th part of the Congius, from
Tables of Ancient Coins,

from whence it had its name. This Sextarius is divided into two Hemiae or Cotyle, according to the verbs of Rhemnae Fnniue.

As Cotylas, quas fsi placeat dicisse licabit
Hemiae, recipit geminam Sextarius sраниц.

It is likewise divided into four Quartarii, which are the half of a Hemia, as appears from Volusius Matianus. It is called Quartaarius with respect to the Sextarius, whose 4th part it is. A Sextarius is also divided into 8 Asse abolula, according to Pliny lib. 21. cap. ultimo.

The parts of the Sextarius were like those of the As; Uncia, Sextans, Quadran, Triens, Quinconx, Semis, Septunx, Bes, Didranx, Decans, Doux; by which words a certain number of Cyathi is meant, a Cyathus being one 12th of the Sextarius.

It was a custom among the Ancients at their entertainments, to drink as many Cyathi to the health of their friend or mistress, as there were letters in their name. Mart. lib. i.

Novea sexto Cyathis septem Jutina bibatur;
Quinque Lycas Lyde quatuor Idæ tribus;
Omnis ab infuso numeretur amica Falerni.

And lib. 5. Mart.

Sextantes, Calliste, duos infused Falerni.

Two Sextantes were 3 of a Sextarius, or 4 Cyathi. According to Cornelius Nepos, Augustus Caesar's highest debauch in Wine was six Sextantes, that is a Sextarius, or a little above our Pint; which he was not able to exceed without vomiting.

The Sextarius Castrænsis was double of the Urbicus, which Agricola infers from a passage of St. Jerome upon Ezekiel. This Sextarius Castrænsis may have occasion'd the expression of a Soldier's Bottle.

Hemia
Weights and Measures, &c.

Hemia is the half of the Sextarius. (Aulus Gallius lib. 3. cap. 14.) It contains two Quartarii, 4 Asinabola, 6 Cyathys, 24 Ligula: as appears from Pollius Matius. The Greeks sometimes use Hemia, adding permutations or itaules.

Quartarius, the fourth part of the Sextarius, as was said before.

Asinabola, the half of the Quartarius, was first so called from Asinum, in imitation of the Greeks, by whom it is called ἀσιναβαλα and ἀσιναβαφον, because it was first us'd for holding Sauce for meat; and afterwards became a certain measure of liquids.

Cyathus, the 12th part of the Sextarius, is a Greek word coming from χαθε, funderet.

Ligula, likewise called Lingua, first signified a Spoon, but afterwards the Latin Physicians came to use it as a measure, containing one 48th of the Sextarius. Columella lib. 13. cap. 21. first it was the fourth part of the Cyathus.

Cochlear, Cochlearis and Cochlearium often denote a Spoon, and sometimes a Measure equal to the Ligula. They are us'd by Pliny and Columella.

There was also amongst the Romans 2 Libra mensuralis, which the Greeks called Xyreg metrēch, and distinguished from the xyreg salmich or the libra ponderalis. This contained of 12 Ounces, and was divided likewise as the As. It was made commonly of horn, and divided by 12 lines, marking the Ounces, from whence it was called by Galen, lycs usurate, curru mensurale. According to Galen lib. 6. de compos. Medicament. this Libra mensuralis weighed 10 Ounces of Oyl; and of Wine 11 Ounces, 2 Scruples, 1 Obolus, and 1 Siliqua; according to the ponderal Libra. The Ancients all along suppos'd the weight of Oyl to be to that of Wine, as 9 to 10, which tho' it differs from our proportion, might be true in a warmer Country, the warmth of the Air expanding Oyl more than Wine. This proportion of the specific gravity of those two liquors holds in this computation; for 11 Ounces, 2 Scruples, 1 Obolus, 1 Siliqua make 1600 Siliquae; and 18 Ounces make 1440 Siliquae; and dividing both by 160 makes it as 9 to 10. Ac-
Tables of Ancient Coins,
according to this weight of Wine assign’d by Galen, the Libra mensuralis contain’d 19,085 solid Inches, somewhat less than ½ of our Pint, Wine measure. But the Roman Measures varying in all appearance this originally was designed to contain 12 ponderal Ounces of water, according to which weight it would be equal to 20,612 solid Inches, the difference between the two being only 1,527 solid Inches.

Of Roman Measures of Capacity for things dry.

Modius, and sometimes in Pliny Modium, deriv’d from modus, was a Measure for things dry. It was the third part of the Amphora or Quadrantal, according to Volusius Matianus. As the Modius was the third part of the Amphora, so the Amphora was one half of the Medimnus. Rhennius Fannius speaking of the Amphora

Hujus dimidium est Urna, & ipsa Medimni
Amphora, terque capit Modium: Sextarius istum
Sexdecies baurit.

Pliny speaking of the value of several sorts of Wheat lib. 18. e. 7. says the Gallick Wheat and that from the Chersonesus was the lightest, not exceeding 20 Libra the Modius. The Sardum was a Selibra, or half a pound heavier; the Alexandrian and Sicilian Wheat added trientes, or four Ounces more, that is, weighed 20 Pounds and 10 Ounces. The Boetian an entire Pound, being in all 21 Pounds. The African added to that a Dodrans, or in all 21 Pounds, 9 Ounces. According to this Account of Pliny’s the Weights of the Wheat stood as follows,

<table>
<thead>
<tr>
<th>Modius</th>
<th>Gallican</th>
<th>240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sardum</td>
<td>246</td>
<td></td>
</tr>
<tr>
<td>Alexandrian</td>
<td>250</td>
<td>Roman Ounces</td>
</tr>
<tr>
<td>Boetian</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>261</td>
<td></td>
</tr>
</tbody>
</table>

In
Weights and Measures, &c.

In English Measure and Weight thus:

<table>
<thead>
<tr>
<th>Peck of Wheat</th>
<th>Ounces Troy</th>
<th>Pounds</th>
<th>Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallican</td>
<td>218.517</td>
<td>18</td>
<td>2½</td>
</tr>
<tr>
<td>Sardum</td>
<td>223.979</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Alexandrian</td>
<td>227.621</td>
<td>18</td>
<td>11½</td>
</tr>
<tr>
<td>Boetian</td>
<td>229.442</td>
<td>19</td>
<td>1½</td>
</tr>
<tr>
<td>African</td>
<td>237.637</td>
<td>19</td>
<td>9½</td>
</tr>
</tbody>
</table>

According to a Table of Sir Jonas Moor's, a Peck of English Wheat weighs 204.884 Ounces, or, 17 lb. 1 oz.

The lightest Grain in the former account weighs above one 18th part more than English Wheat. The Gallican Wheat was that of the southern parts of Gaul, and I believe the same proportion would answer observation at this day. All which is to be understood at a medium, for the weight of grain differs very much in different years.

I have been more particular in the account of this experiment of Pliny, because it shews that the Measure of the Roman Modius is calculated pretty true, tho' by some Writers it is reckon'd an uncertain Measure. There are Trimodia and Decemmodia, rustic Vessels. C. Colum. lib. 12. cap. 18. & 9.

Cato speaking of the allowance to Servants, gives it as follows. *Familia cibaria; qui opus facient per hyemem tristici modios quaternos, per aestatem quaternos semis: Villico, Villicæ, Epistæ, Opilioni modios Ternos: Compeditis per hyemem panis pondo quaterna: ubi vineam fodere caperint, panis pondo quina, utque adeo dum fusc esse caperint: deinde ad panes quaternos redito.*

This allowance of four or five *Modii* of Wheat which is somewhat more than so many of our Pecks, must be suppos'd monthly, for Donatus in *Phormionem Terentianum* informs us that the monthly Allowance of Servants was four *Modii*: from whence it was called *Demenium* either from *Mensis* or *demetiendo*: which is a word used by Terence, as follows, *Quod ille unciatim vix de Demensio suo, suum defraudans genium comparfit miser, id illa universum abripiet, haud N exstimientos*
Tables of Ancient Coins.

exsimians quanto labore sit partum. It is to be observed that the Bayliff, Reive and Shepherd, had less allowance of Wheat than the rest, but i t is to be premum’d they had besides their Wheat other provisions given them which the inferior servants had not. As for the four or five Pondo of Bread which the Compedites had, it’s not certain what time it was to serve them.

It will afford some light in the analogy of their Measures superficial and of Capacity, as well as in their Husbandry, if we take notice what quantity of seed of several grains they us’d to sow in a given quantity of ground; which according to * Pliny was

5 Modii of Wheat
6 Modii of Barley \{ to the Jugerum.
6 Modii of Beans
3 Modii of Pease

Which in English Measure is

<table>
<thead>
<tr>
<th>Burs.</th>
<th>Pecks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0 ½</td>
</tr>
<tr>
<td>2</td>
<td>1 ½</td>
</tr>
<tr>
<td>2</td>
<td>1 ½</td>
</tr>
<tr>
<td>1</td>
<td>0 ½</td>
</tr>
</tbody>
</table>

There are several other Grains mention’d in that Chapter, but this is sufficient for a proof.

Semimodius, or the half Modius containing 3 Sextarii, is mention’d by Cicero, Varro and others.

Sextarius was likewise us’d as a Measure of dry things: as in Palladius: Triginta columbis volantibus diurni tres Sextarii tritici sufficent.

Hemina is a measure of things dry in Cato, Columella and Palladius.

Quartarius,

Weights and Measures, &c.

Quartarius, Pliny uses as a Measure of things dry. lib. 18. c. 43.
And so were Aestabulum, Cyathus and Ligula, whose capacities and proportions to one another, are already given in the chapter of liquid Measures.

Varro and Pliny mention Concha as a Measure for things Dry. Cleopatra saith it was of two sorts, the lesser was equal to one half oxybathum; and the greater to an oxybathum and a half.

GREEK Measures of Capacity.

In reducing the Greek solid Measures to the English I shall make use of the χενί, which made in Weight 720 Drachms according to all Authors, suppose of Rain-water, the Ancients making no difference betwixt the weight of that and Wine. Taking the heaviest Attick Drachm, which is the hundredth part of the old Attick Mina or our Averdupois Pound, and neglecting the small difference in the Tables, I shall state it at 70 Grains Troy. According to this Drachm, the weight of the Attick χενί must be 50400 Grains. There are in a solid Foot 17-28 solid Inches, weighing 76 Pound of Rain-water: by this Experiment, 760 Grains make 3 solid Inches, therefore 50400 make 19393737 solid Inches, the number of solid Inches in the χενί; which is 6 Pints, 25.628 solid Inches, somewhat less than the Roman Congius; tho' the Greek χενί and the Roman Congius are used indifferently as the same Measure by ancient Authors; as likewise are the 6th part of them, the χενίου and Sextarius; and the 12th, the χενίουη and the Hemina. There is great probability that the Greeks measured the capacity of their vessels by the weight of Oyl, the product of their Country. For the Physicians speaking of those Measures always mention their weight in Oyl; and Galen speaking of the Cotyla, saith that Heras understood the Cotyla to be of 60 Drachms, reducing the weight to Oyl. Galen lib. 5. de compos. Medicam. I find likewise that it is a general Supposition among the Ancients, that the weight of Oyl
Tables of Ancient Coins,

Oyl was to that of Wine as 9 to 10; so in the fragment printed after Galen of the Composition of Medicines, 72 Pounds of Oyl is made equal in bulk to 80 Pounds of Wine, 9 Pounds of Oyl to 10 Pounds of Wine, and so every where. According to our experiments the weight of Oyl is to that of Wine or fresh water as 476 to 527, which is very near as 9 to 9.96. So small a difference, as we observ'd before, may be accounted for, by the Oyl weighing less in a warm country than in ours: for warm Air expands Oyl more than water. If we were to make a χός from holding 720 Drachms or 70 Troy Grains of Oyl, upon this supposition of the specific weight of Oyl being to that of water, as 9 to 10, it would be much larger than the Roman Congius, the contrary of which is known. But if they settled their χός by the weight of Oyl, it must have been by a Drachma of 63 Grains, very near such as that of the Tables.

The largest Greek Measure for things liquid was the Attick μετρητής of the masculine gender, (tho' Cato and Columella use Metretæ feminine) μετρητής ἡ χός ἐς ἵππος, that is, the Metretæ is 72 ἵππος, apud Nicandri interpretam. Dioscorides de vino veratro, saith ἀνά μετρητής χός ἰζ, that is to say, it contains 10 χός. Some approve of this reading: But Alciatus and G. Agricola, instead of χός ἰζ, read χός ἰζ. So that it contain'd 12, which is confirmed by Epiphanius, Cleopatra and Galen. Rheimnus Fannius makes the Metretæ; of the Amphora, in these verses,

Attica praeterea dicenda est Amphora nobis,
Seu Cadus; hunc facies, nostra si addideris Uram.

But this is true only on supposition that χός and Congius were precisely equal, whereas they were but nearly so. Metretæ is called αμφοτερος in Pollux, but ασλυος is to be understood, to distinguish it from the Roman. Dioscorides lib. 5. ues μετρητής ἱταλυος for the Roman Amphora.

Kadoc
Weights and Measures, &c.

Kados comes perhaps from χαδῖν, which signifies to contain, or from the Hebrew Cadd, a Measure mention'd in the Bible, and translated ὑδεῖα by the LXX. It was a Measure equal to the Metretes. For what Dioscorides lib. 5. calls μετρητὴν γλυκύνας, Pliny lib. 14. cap. 16. renders Cadum musti. It is sometimes writ with a double ς; as in Pollux lib. 9. where he tells that ἀμφόευς was called κάδος by the Ancients. And the same Author relates from Philochorus that ἱμαμφόευς εἶναι ἤμικάδδιον. From κάδος comes κάδυχος and κάδυχος, as Congialis from Congius.

Julius Cæsar at his Triumphal Supper, according to Pliny, lib. 14. cap. 15. gave 100 Cadi of Chios Wine, that is 4 Tuns, 25½ Gallons.

The same Author saith lib. 14. cap. 15. that Hortensius left to his heir 10000 Cadi of Wine; that is 410 Tuns, and 28 Gallons.

L. Lucullus gave a Congiary of 100000 Cadi, or 4101 Tuns, 44 Gallons.

Cadus was called κεφίμων. Hesychius saith κάδος ἐστὶ κεφίμων. In several printed books Ceraunium is put erroneously for Ceranium.

Hesychius saith κεφίμων τῷ οἴνῳ ὑδατός ταμνίαν. So Cadus and Stamnium are the same.

Suidas makes a difference betwixt χους and χους, when he faith χους διὸ ξίφων, χους ἢ ἔξ. But all other Authors make them the same. The Greek Physicians sometimes use χους for the Roman Congius, the difference being but small.

Athenæus relates that Milo a Crotoniate drank at once 3 Choes of Wine, which is about 2 Gallons, five Pints.

The same Author saith that Alexander after he had drank up a Cup of 2 Choæ (or 14 Pints) and was going to take another, he fell ill and dyed.

Choæ were certain Festivals at Athens, so called because every one had a Chus of Wine given him, according to Suidas. And Athenæus says that Demophoon King of Athens promised the reward of a sweet Cake, and Dionysius the Tyrant a Crown of Gold, to the
Tables of Ancient Coins.

The first man who drank a γές (or 7 pins) in those holidays: which was a very barbarous thing among such polite people as the Athenians.

The γές contain'd 12 Cotyle according to Cleopatra, α γές ἔχει μέτρη μεν κοτύλαις αὐτίκας δώδεκα. The same is confirmed by others. And Athenaeus lib. 11. saith that λαγύναω contain'd the same number of Cotyle. So it was equal to the γές. It is sometimes us'd in the neutral gender as λαγύναω, and sometimes it is called λαγύναω: which some translate lagena.

As the Romans borrowed the name of the γές from the Greek γές, so did the Grecians in later times borrow the γές from the Roman Sextarius. It was the 6th part of the γές; as appears from Galen and others.

Κατυλή, so called from its Cavity. Athenaeus lib. 19. pri το κοτύλιν κοτύλων ἐκάθεν ॐ παλαμόν, i.e. the Ancients called every concave thing κοτύλη. The same Author saith likewise κοτύλης ἵ καλεῖται μα μα τῆς ἱγίως κοιλών, that is, the Cavity of the Cylindrical is called Cotyle. There were, according to Galen, several Cotyle, such as the Alexandrian and Ephesian: but the Attic Cotyle was one half of the γές. Interprets Aristoph. in Pluton, εἰσὶν κατυλήματι ἵ εἰσίν εἴδως μέτρα, ὅ λέγουμεν ἡμεῖς ημὶς γείων: i.e. the Cotyle is a Measure which we call a half γές. Rhemmius Romanus.

At Cotylos, quas, si placet, dixisse licebit
Heminas: recipit gaminas Sextarius unus.

From κοτύλη comes τρικοτύλινος ὀίνος in Hesychius, which signifies as much wine as three κοτύλαι hold.

Τευθλίν was the same Measure as the κοτύλη, as appears by Cleopatra and Galen.

Οὐκαλος was a Measure answering to the Roman Acotakidum. Plin. lib. 15. cap. ult. saith it was the fourth part of the Hemina. Hesychius saith it was called κυός, κύς, Κατικλέως, and κυκετος.

Κύκλως
Weights and Measures, &c.

Κύανος was the 12th part of the χρύσος, according to Epiphanius and others: from thence comes κυάνια, κυάνια, which Plautus uses in Menæchmus; it signifies to fill drink to one, or serve one at drinking. Suetonius likewise uses this word Cyathifare.

Κόχυς, or Concha, has its name from a Shell: there were a greater and a less; according to Cato cap. 13. de re Rust. But it appears from these words of Pliny lib. 12. cap. 29. Alexandro M. res ibi gerente, toto die aestivo, unam concham implevi, iustum erat; that it was a certain Measure. Cleopatra says that the greater Concha was equal to the Oxybaphum, and the lesser to one half of the Cyathus.

Μύριον, and sometimes μύρια, is so called from μύς, a Moule. Aristotle saith the sea-moule was a shell-fish; and from it probably this Measure is so called. Cleopatra relates that of this Measure there were two kinds, the greater which was the 16th part of the Cotyla; and the lesser the 4th part of the Cyathus. οἱ κύανος ἑξή μεγάλοι μύρια τέσσαρα. The greater Μύριον was called Georgicum: as being only a Rustick Measure. Μύριον is called τριγύνος by Hesychius.

Χύμη was a Measure, having also its name from a Shell-fish. There was the greater or Rustick Cheene, the 20th part of the Cotyla; but the lesser, which the Physicians used, was the 30th part of the Cotyla. This appears from Cleopatra.

Κοχλιαίου, in Latin Cochlear, was the smallest Measure for liquids, it is equal to one half of the Cheene. Rhemnius Fannius,

--- At tertia Mystri
Quam vociant Chemen, capiit haec Cochlearia bina.
Greek Measures of things dry.

Медимнос, or μεδιμνον in the neuter gender, the Greeks commonly used it with the acute Accent on the antepenultima: but the Athenians wrote it μεδιμνος, with the accent on the penultima. It was a Measure for dry things, such as Wheat, Barley, Flower, &c. and contain'd 48 Chœnices according to Pollux, Harpocratin, and Galen de mensuris. But this here is meant of the Attick Medimnos: for there was likewise the Georgicus, Macedonicus, Siculus, Cyprius, &c.

Suidas mentions the following proverb: μεδιμνον απομετεαω
αξιο τη πατερας αγιοριων, b. e. I measure the money my Father leaves me by a Medimnus: (with a Bushel.) Which is the same as one should say, that he had a great fortune left him.

Χοινις or Chœnix is a dry Measure containing 3 Cotyla according to Cleopatra: and so was 1/4 of the Ξεσης; which already is shewn to be 33,158 solid Inches: this number multiplied by 4 gives 49,737 solid Inches equal to the Chœnix; which again multiplied by 48, gives the Medimnus 2387,376 Inches, that is 4 Pecks, 6 Pints, 3,501 Cubick Inches.

The Ξεσης, κοτύλη, οξύβαφον, κιόθος, and κοχλιάριον, were also used as Measures for things dry; their capacity and proportion to one another is the same as when they are Measures for liquids, which have been shewn already.

The Jewish Measures of Capacity.

In determining the capacity of the Jewish solid Measures I have followed Dr. Cumberland in the Tables formerly published. There is a greater difference between the Rabbins and Josephus in the account of the Jewish Measures of Capacity, than in that of their Weights and Coins. However we shall not so positively adhere to
to the one or the other, as to omit giving the Objections and Arguments on both sides. Dr. Cumberland takes the Ephah to be the 6th part of the Cube of the Jewish or Egyptian Cubit, which Cube is called Ardub. The Egyptian Cubit is according to him 21,888 Inches, and its Cube 10486,2, whose sixth part is 1747.7 solid Inches equal to the Ephah. That the Ephah was the 6th part of the Cube of the Egyptian Cubit, the Bishop proves from the accounts of the Arabian Mathematicians, in which by an usual commutation of the quietest letters it is called Oeba or Waiba, which last word is us'd in the Arabian translation to express Ephah.

According to Golius, at Babylon the Ardub was equal to six Ephahs, and this proportion was generally acknowledg'd in the Eastern Countries. He observes that 1747.7 solid Inches differ very little from 1728, the Cubick Inches of an English Foot. The neglect of a few centesimals in the side of the Cube would bring it to an equality with the Cube of a Foot.

The Bishop observes likewise that his Ephah or 1747.7 Cubick Inches contains 1000 Ounces of pure Rain-water; this is not true, supposing the nicest proportion that the Averduois Pound has to the Troy is that of 175 to 144; tho' that in the Tables be only as 17 to 14, neglecting the last figures. According to which the Averduois Ounce (whereof there are 16 in the Pound) is to the Troy Ounce as 175 is to 192; and 100 Ounces Averduois are equal to 43750 Grains Troy, which allowing 760 Grains to a Cubick Inch of Rain-water, make 1726.97 solid Inches: which is exceeded by the Bishop's Ephah or 1747.7 by 20.73 solid Inches, above 1 of a Wine-pint. The Ephah or 1747.7 solid Inches make of Wine-measure 7 Gallons, 4 Pints, 15.2 solid Inches: and of Corn-measure 9 Pecks, 2 Pints, 32.075 solid Inches.

Josephus lib. 15. cap. 11. saith ὅ κόρος δύναται μεδίμνης αἱτιαίς ἐκ: whereby it is infer'd that the Ephah, the tenth part of the Corus, was equal to the Medimnus Atticus: which according to the Tables contains 2354.751 solid Inches: and exceeds the Bishop's Ephah by 607.051 solid Inches, which make above a 0 quarter
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quarter of the whole Measure: and seems to be too great a difference to happen by any neglect in the mensuration.

The Bishop proposes an Argument drawn from his emendation of the following corrupted passage of Hesychius ὀἱ τετραγάνων ἰγκύλων τεσσάρων εἰκόνων, b. e. the Ephah an Egyptian Measure equal to four Chonices: which is certainly very far from the truth. The Bishop for τεσσάρων puts ΔΔΔΙΙΙΙ, which signify 34, and so makes the Ephah to be 34 Chonices, which coincides nearly with his determination of it. But this seems to be a very weak argument.

Salmasius in his Epistle to Waleus, cites an ancient Anonymous Latin Author, who affirms that duo Cori Culleum reddunt, b. e. that two Cori are equal to a Culleus. A Culleus contain’d 20 Amphora, and a Corus 10 Ephahs. Therefore according to this passage the Ephah was equal to the Roman Amphora, which, according to the Tables, is 7 Gallons, one Pint, and 10,66 solid Inches, or 1656,535 solid Inches, which is less than 1747,7 Inches by 911,65 solid Inches, or above 3 Wine Pints.

Another argument of the Bishop is, that "Suidas in σάτον, which is the Hebrew Seab, affirms it to be the Roman Modius filled so as to run over its brinks, and that it holds in liquids 15 Sextaries or 25 Pounds." But this is a false Measure of the Roman Modius given by Suidas, for it contains 16 Sextaries, or 16 Pounds 8 Ounces. The Bishop adds that "15 Roman Sextaries are equal to 2 Congii, which in solid Inches measure of water makes 517,66, being 300 Ounces of Weight, but this is less than the 3d part of our Ephah, that being 582: so there wants above a Quart of our Wine measure. And Suidas implicitly confesseth: his Measure too little, by saying it must be ὑπερτεπτελομείνον, heaped up so as to run over. But if instead of 15 Sextaries there be taken a Modius, which is 16 Sextaries: that heaped up so as to run over will come very near the Bishop’s Seab, or third part of the Ephah.

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The Bishop proceeds to inform us "that the Modius was less
than the Seah; Epiphanius affirmeth, that it was equal to a Modius
"and §, and Josephus lib. 9. c. 2. and Hierom, on Matth. xiii.
"33. say, it was an Italian Modius and an half.

After giving the mensuration and argumentation of Dr. Cumberland, Bishop of Peterborough, I think it would not have been
fair to have suppress'd thofe of another Reverend Prelate, who
seems to be much better qualify'd than the former to write upon
this Subject. There are Tables computed upon both Systems,
and the Reader may use which he pleaseth.

Jewish Measures for things liquid.

Bath, so called from Cavity or Capacity, the LXX write it
Bath. δύσων χυλάδας Bath ελαιον. 1 Kings, cap. 5.

According to Josephus lib. 8. cap. 2. it contain'd 7 Attick
Sextarii, which is different from Bishop Cumberland's Measure in the
Tables. The LXX render it sometimes by the word itself, as
before; sometimes by μεσωτῆς, Z. Chron. cap. 4. sometimes by
κεραμον Isaiah cap. 5. The ancient Latin version translates it
Lagenæ. It was the 10th part of the Chomer in liquid things, as
the Ephah was in dry. Ezekiel xlv. 11. The Ephah and the Bath
shall be of one Measure, that the Bath may contain the tenth part
of an Homer, and the Ephah the tenth part of an Homer.

Him likewise a liquid Measure, as of Oyl. Exod. 30. Ezek. xlv.
46. Of Wine Exodus 29. Levit. 23. According to Josephus, it
contain'd two Attick Congii, lib. 3. cap. 9 & 10. Therefore it was
the 6th part of the Ephah. Josephus writes, lib. 3. αγχαμον.
that they offered with an Ox the half of a Him of Oyl; or in Eng-
lish Measure according to Josephus 6 Pints, 25.698 solid Inches,
according to the Tables, 5 Pints 1,267 solid Inches. With a
Ram they offer'd the third part of a Him or 3, Pints, 10,469 solid
Inches. And with a Lamb the 4th part, or 2, Pints, 15,071 solid Inches.

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The Prophet Ezekiel was commanded to drink water to the quantity of the 6th part of a Hin, that is 1 Pint, 19.672 solid Inches.

The LXX render Hin falsely χῦν or one Congius, Levit. 19; and with a much greater difference from the truth, the Latin Version renders it Sextarius. Epiphanius makes a twofold Hin, the greater of 18 Sextarii, the lesser of 9.

Log, a Measure of liquids, Levit. 14. It was the 72d part of the Bath or Ephah, and the 12th part of the Hin, according to all the accounts of the Jewish Writers. Benedictus Arias upon Ezekiel derives Lagena from Log. The ancient Latin version translates it Sextarius. And the Greek version falsely, Cotyla, Levit. 14.

The Cor or Chomer, and with a Greek termination Coros, it was most commonly a Measure for things dry, and the greatest that was us'd among the Jews. As of Barley, Levit. 27. of Wheats Kings iii. 2. 2 Chron. ii. 1. It contain'd according to the Rabbins 10 Ephahs, and 30 Sata or Seals. Coros is the more usual term in the historical Writers, and Chomer amongst the Prophets.

Josephus lib. 15. cap. 11. αγχαιαν. makes the Coros equal to 10 Medimmi Attici, because he makes the Ephah equal to one Medimmus. The Jews were commanded to give the 6th part of an Ephah out of the Homer of Wheat, Ezek. xlv. Chap. 13. that is one part out of sixty.

Epiphanius makes the Coros equal to 30 Roman Modii, and the ancient version renders it the same. Isaiah 5. Levit. 27. According to which proportion the Seab and the Modius must be equal. Benedictus Arias in Sata faith that a piece of ground sowed with a Coros of Barley, could not be less than 730,000 square Cubits: That is, a piece of Ground sowed with a Quarter of Barley could not be less than 55.4 Acres, which cannot be true.

The Comer contain'd two Letechs, Hosea 3. The 100 Cori of Barley, 1 Esdras vii. 3. Or a Letech was the half of the Comer, and fo the ancient Version has it. St. Ambrose lib. 9. Epist. calls it Semigomer.
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Ephah was a Measure of things dry, as of Barley, Ruth 2. and Meal, Judges 6. and Numbers 5. and was of the same capacity with the Bath in liquids. It contain'd 3 Sata or Seabs. The Chaldaic Paraphrase renders the Ephah 3 Seabs, the ancient version 3 Modii. Ruth 2. Josephus lib. 9. cap. 2. makes the Seab equal to 1, Italic Modius, the Sesquimodius containing 2.4 Sextarii, which multiplied by 3, makes 72, the Measure of the Ephah assign'd by him. The LXX render Ephah variously, sometimes by the word itself, 1, or 1. Levit. 5. Numbers 13 and 18. Judges 6. Ruth 2. 1 Samuel 1. and 25. Sometimes by the word πέμφα. Ezek. 4. So the Latin Version has Ephah variously translated: as by Ephi, a corruption of Ephah; and by Modius, Levit. 13. and sometimes it's render'd 3 Modii, Esai. 5. Ruth 2. Sometimes it is confounded with Sata or Seab: It's render'd Amphora by the old version, Zucbar. 5.

Sata or Seab is one of the oldest Measures for dry things, as of Meal, Gen. 18. 1 Kings 18. 2 Kings 7. It was the third part of the Ephah.

The LXX render it variously; sometimes by μετρον in general. Gen. 18. sometimes very improperly by μετεμφεσ, which is a Measure for liquids, and much larger than a Seab; sometimes they render it 1. Sam. 25. which contains 3 Seabs. And Hagg. 2. the LXX has σάτα, whereas in the original there is no particular Measure mention'd.

The old Latin Version has Seab differently render'd, as by Sata, 1 Sam. 25. by Modius, Ruth 3. 1 Kings 18. it's translated 2. aratiumcula.

Omer or Gomor is a Measure for things dry. Exod. 16. Levit. 5. and 6. it was the 10th part of the Ephah.

The LXX and Epiphanius confound this Measure with Chomer or Coron, (which is a much greater one:) and render them both by γόμορ. Assarim and to δέκατον, signify the same as Gomor. Josephus lib. 8. calls it ισογεων. In the Hebrew instead of Gomor, Assarim is often us'd, it signifies the 10th part, viz. of the Ephah. Josephus
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Sphyrus lib. 3. says that in the time of Claudius an Assaron or Omer of Meal was sold for four Drachmae, that is at the rate of 8 Shillings the Peck: but it was in the time of a dearth.

Cab or Kab, and κάμος in Epiphanius, in Latin Cabus, was the 6th of the Seab. Benedictus Arias faith that a Cab of Wheat sowed 10 square Cubits of Ground, which is at the Rate of 6 Quarters, 7 Bushels and 1 Peck to the English Acre.

In the Scriptures are also found Nebel, Afsa, Nod, Cad, Aboth, Purah, Bachuc, which some Authors take for certain Measures; but they rather seem to have been the names of Vessels of no determinate bigness.

The Account of the Hebrew Vessels according to Josephus, taken from Bishop Hooper.

"The Quantity of the Jewish concave Measures, as it is deliver'd by the Rabbins, is uncertain. Josephus the Historian of that Nation gives a plainer account of them; and very consistent with that he has made of the Jewish Weights; making them also equal to the Attick. He manifestly speaks the Log equal to the Attick Xestes, when he expresses the quarter of a Cab (in the second Book of Kings, Chap. 6. ver. 25.) by it: And likewise when he says a Him of 12 Logs, at a par with an Attick double Chous of 12 Xestes: and also a Bath the same Measure for liquids (as appears from Ezekiel xlv. 11.) as an Ephah is for dry, and consequently of 72 Logi, or 72 such Xestes; not to add that he puts 10 of these Ephahs in a Corus, as equal to 10 Medimni: those testimonies of equality in these Measures, are sufficient to let us know, that the Jewish Vessels of any certain number of Logs, were equal to the Attick of the same number of Xestes, and that if there be an Expression of one or two of them, that seems to import a difference; it must either be wrong read, or not right understood.

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"An Omer or Gomer, for Example, which is declared to be the
tenth of an Ephah in Exodus, and by the name of a Tenth-deal,
or Assaron, in Numbers; and can be nothing else but the tenth of
7½ Xестes; or 7½ Xевtes; is yet under that very name expressed
in Josephus, as he is now read, by 7 not Xестe but Cotyla. And
this Difference must, in all probability, have risen by some error
of his Transcribers. Epiphanius giving an account of that Assa-
ron, makes it consist of 7 Xестes and a fifth, which is exactly
its due quantity; and leaves us to suspect, that in Josephus, Xес-
est at least should be read in the place of Cotyla; and with or
without a fraction, as the Author may be supposed to have de-
signed Exactness, or been content with a near ordinary Approach:
"Ordinary, I say, because tho' the fifth part of a Xестes being a
simple fraction, and Arithmetically regular; it is yet no proper
part of that Measure, nor can it be expressed by the lower Mea-
sures. But Theodoret, on the other side, seems in his Copy to
have read Cotyla, as it stands now in ours. And if we therefore
choose to make no change, and take in the τεις ἡμείναν κοτύλας:
ἀριθμόν, which he cites as from Josephus; we may then conjecture,
that the τεις now in Theodoret, was an abbreviated τεισαραγες in
in a better Copy; and that πίνα before τεισαραγες had been once
read, and by this reckoning we then have 1 ¼ Cotyla and a half,
or 14½; which exceed the due quantity, 7½ Xестes or 14½ Co-
tyle but by the tenth of a Cotyla.

Such various conjectures there may be about the expression,
of Assaron by Josephus; and yet no Doubt remain concerning his
Intention to express, in some manner, the same 7½ Logi.
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Of the Measures of Capacity of the most noted Eastern Nations.

Besides the Measures of the Romans, Greeks and Jews already mention'd, there are those of the Persians, Egyptians, Syrians, and Arabians, which I shall give some account of, since they frequently occur in the ancient Authors, as well sacred as profane.

Of the Persian Measures.

\(\text{Αχαίν}^{a}\) is a Persian Corn Measure, containing 45 Attick Medimnæ.
\(\text{Αρταῖον}^{b}\) contained an Attick Medimnus and 3 Chorices.
\(\text{Καπιθή}^{c}\) was equal to 2 Attick Chorices.

Of the Egyptian Measures.

\(\text{Αρταῖον}^{d}\), among the Egyptians, was equal to 3 \(\text{i Modii.}\)
\(\text{Απόρρυμα}^{e}\), a Measure used only at Thebes in Egypt, was equal to 11 \(\text{ζέτης.}\)
\(\text{Σαῦης}^{f}\) was equal to 22 \(\text{ζέτης.}\)
\(\text{Οἰφυν}^{g}\) was equal to 4 Chorices.
\(\text{Ἰνόβα}^{h}\), an Alexandrian Measure contained 2 Pounds of Oil.
\(\text{Σευδή}^{i}\) was equal to the Cotyla.
\(\text{The Egyptian Modius was equal to 8 Chorices.}\)

Of the Syrian Measures.

\(\text{Μετεπής}^{j}\) was equal to 120 Sextarii.
\(\text{Κόλλαθων}^{k}\) was equal to 25 Xesta.

\(\text{Σάδηλα}\)

\(a\) Interp. Aristoph. in Acharnensibus. \(b\) Hesychius. \(c\) Xenoph. lib. 1. Anab. Cyri. \(d\) Rhemnus Fannius. \(e\) Epiphanius. \(f\) Idem. \(g\) Epiphanius. \(h\) Galenus seu Grecus ignotus. \(i\) Cleopatra. \(i\) Cleopatra.
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*Σαλβαδω* was equal to 22 Xestae.
Xoïng a Syrian Measure mention'd by Palladius, the capacity not mention'd.

Of the Arabian Measures.

The knowledge of the Arabian Measures is necessary for those who read the Arabian Physicians, such as Avicenna, Razes, Serapts, Mesue, Halyabbas, &c.

° Dorach equal to the Roman Amphora.
& Aldorach equal to 2 Xesta.
=S Jobem equal to the Congius of the Romans.
= Kist equal to the Roman Sextarius.
, Korboni equal to the Hemina.
= Kiliathi equal to one half of the Cotyla.
= Kestuf equal to the Acetabulum.
* Cuathum equal to the Cyathus.
= Falgerin equal to the Cochlear parvum.
Brial, a Measure of uncertain capacity, mention'd by Avicenna.

Mustarum, the greater equal to Ἄεμινα.
The Lesser equal to Ὅυθυθυς. A corruption of the Greek μύσεων.

Some other Measures not common, which are found in particular Authors.

*Addex and addex, equal to 4 Chonices. Aristophanes. Interpres Homeri.
Aig, the same with Oxybaphum. Hesychius.
Aldeaseow, equal to half the Xestes. Epiphanius*

= Idem. o Serapio lib. 7. compendii. Agricola ex Dioscoride & Serapione. x Galen.
= Serapio. f Avicenna. = Idem. g Geo. Agricola ex Dioscoride & Serapione.
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'Ανίς, the same as Oxybaphum. Hesychius.
'Αγωγή, equal to the Cotyla. Hesychius.
'Αγωγή, supposed equal to the former. Dioscorides.
'Αγώνικος, equal to the Cotyla. Eustathius.
'Ακύσταυρα, a brazen Vessel for holding Oyl. Interprets Aristophanes.

Βατάν, an Alexandrian Measure. Hesychius.
Βαρδίων, a Measure mentioned by Hesychius.
Βαραφιών, a Tarentine Measure, equal to the Acetabulum. Hesychius.

Βαζέος, the same with Mystum in Hesychius.
Βίκος, a Wine Measure, the same with σάμος. Hesychius.

Αθηναίος.
Γαλαχος, equal to the Tryblion. Hesychius.
Γαλαχων, the same with the former. Hesychius.
Γαλαμακος, the same also as Tryblion. Hesychius.
Γνωμα, the tenth of an Araba. Epiphanius.
Δαδις, equal to six Chonices. Pindar lib. 4.
Δεινος, equal to a Mteres. Athenaeus lib. 11.
Διηθία, half a Medimmus. Hesychius.
Διπτόον of uncertain capacity. Hesychius.
Διειζα, a quarter of a Xestes. Hesychius.
Διενίος, equal to the former. Hesychius.
'Ελεφας, equal to three Choes. Hesychius. Athenaeus.
'Ελευθεριος, equal to ten Cotyla. Hesychius.
'Ελευθηριος, Hesychius.

Εμμαχαίος, equal to an Oxybaphum. Hesychius.
Εμμαχαίος, a Cnidian Measure. Hesychius.
'Ημελος, equal to four Chonices. Hesychius.
'Ημόγιοος, equal to two Choes. Hesychius.
'Ημωθεκατος, equal to half a Choes. Hesychius.
'Ημωκόλιον, a Wine Measure. Hesychius.
'Ημωκόλιον, half a Medimmus. Hesychius. Epiphanius.
'Ημωκολίον, equal to four Choes. Hesychius.
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'Ina, an Egyptian Measure, equal to two Cattyla. Chorapme.
Kamaghis, a Corn Measure equal to half a Medimns. Hesychius.
Kamudns, an uncertain Measure. Hesychius.
Kanasey, mention'd by Hesychius.
Kanetis, mention'd by the same.
Kamuslaik, a Measure or rather a Vessel of uncertain bigness.
Epiphanius.
Kophinos, a Measure both of Liquids and Dry things. Pollux.
Hesychius.
Kyneg, mention'd by Hesychius.
Kyneghs, a Corn Measure, equal to half a Medimns. Hesychius.
Kynepos, a Vessel of a Measure of 10 Sextarii according to Epiphanius.
Kotila, supposed equal to a Cymex. Hesychius.
Kotyla, an Ephesian Measure of uncertain bigness. Galenus.
Kordu, an Athenian Measure equal to ten Cattyla. Athenaeus. Hesychius.
Kordlia, a Vessel equal to the Cattyla. Athenaeus.
Kouros, equal to 12 Cattyla. Athenaeus.
Kouros, equal to a Tryblion. Hesychius.
Kouros, a Meal Measure. Hesychius.
Kouros, a Milk Measure. Hesychius.
Methalides, a sort of Cup, supposed equal to a Cystus. Hesychius.
Mains, an earthen Vessel, holding 5 Cattyla. Athenaeus.
Makeis, equal to six Cattyla. Hesychius.
Maexios, equal to two Medimns.
Maios, a Corn Measure among the Cyprians, equal to 10 Modii. Epiphanius.

Zize, that of Alexandria held two Pounds of Oyl. Epiphanius.
Oydoa, equal to a Semicenmin. Hesychius.
Oinouius, a small Wine vessel. Hesychius.
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Oluatium, a kind of Measure, mention'd by Festus Pompeius. 
Orca, a large Vessel for holding new Wine. M. Varro, lib. 3.
cap. 13.

Oudoxia, equal to half the Metretes. Hesychius. 
Paulava, the same as Tryblium. Hesychius. 
Pedaxhm, the same. Hesychius. 
Phege, a Corn Measure. Hesychius. 
Potyp, a certain Measure. Hesychius. 
Phoxoes, equal to a Xestes. Hesychius. 
Puron, equal to three Cubes. Athenaeus. 
Sumpeus, a Measure for Wine; among the Libyans. Hesychius. 
Trochion, of different bigness. Hesychius, Cleopatra; Athenaeus. 
Toxos, equal to 10 Chonices. Hesychius. 
Teyodrion; a Tarentine Measure. Hesychius. 
Xytagdrion, a Measure mention'd by Hesychius.

Besides the Tables formerly printed, I have given decimal ones of the Measures of Length and Capacity, for conveniency in computation. But in the Jewish Measures I have not follow'd Dr. Cumberland, but chose rather to deduce their Measures of Length from the Cubit drawn from the Pyramid, and to deliver their Measures of Capacity according to the account of them given by Josephus, which I prefer to that of the Rabbins. I have also given a Table of the ancient Arabian Weights which were used by their Physicians, which is necessary for any that reads them with accuracy: and from their writings are taken the Authorities on which that Table is founded.

There is likewise a Table of the French Weights; and one of those of Cologne, which are us'd through all Germany in weighing Gold and Silver.

I have also given Tables (tho' not at large) of the Weights of the most noted Cities and Countries of Europe: and Tables of their Measures of Length, all from the best hands; and I chose rather to omit those of Places of less note, than to give such as I could
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could not recommend for their accuracy. There needs no further explication, the title of the Tables themselves sufficiently shewing what they are.

The Tables of the modern Coins were communicated by Sir Isaac Newton, who has been always as industrious in promoting the publick good, as gloriously successful in the Discoveries of Nature. They were calculated by that accurate person from actual Essays made in the Royal Mint, about the beginning of this Century, when Guineas went at 21 s. 6 d. So that the Value of Gold Coins must be now diminished by one 43d part. In order to understand the Tables, the Reader must be inform'd, that one Pound Weight of Sterling Money contains 11 Ounces, 2 Pennyweight of fine Silver, and 18 Pennyweight of Alloy. The Gold Coin of England contains one 12th part of Alloy.

The first Column of the Table expresseth the Fineness of the essayed piece, the letter B signifying better, and W worse than the English Standard. The second Column contains the absolute Weight of the piece, the third Column the Standard Weight, or its Quantity of Standard Metal. The fourth Column expresseth its value in English Money. For example in the second article of Silver Coin, the Sevil piece of Eight, is 14 Pennyweight in the Pound worse than the English Standard, weighs 14 Pennyweight, contains 13 Pennyweight 21 Grains and 15 Mites (of which there are 20 in the Grain) of Sterling Silver; and is in value 43 English Pence and 11 hundredths of a Penny.
A DISSERTATION

Of Roman Money Affairs.

LTHO' Examples proper for the application of the Tables occur frequently in all ancient Authors, yet to comply with the custom of Publishers of Tables, and to show the use of them to those who are not daily perusing such Authors; it seemed necessary to add a Collection of Examples, which might accustom the Reader to such Computations. I then considered that by the classing and methodizing such passages, I might instruct the Reader in the Subject, as well as in the practice of the Numbers; which reflection was the occasion of the following Dissertation, if that be not too assuming a Title.

The Curious have thought the most minute affairs of Rome worth their notice; and surely the consideration of their wealth and expences is at least of as great importance as Grammatical Criticisms, Rites, Ceremonies, Figures of Vases, Instruments, various Shapes of habits, &c. upon which the Learned have perhaps taken too much pains, which might have been better bestowed upon the more manly enquiries into their Business, Arts, Professions, Oeconomical and Political Management.

For ought I know, the following way of considering the Affairs of Rome, may be new. For those who have wrote of their Luxury, have considered their Riches, Expences and Prices of Commodities only accidentally.

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I do most sincerely and without any affectation acknowledge my own incapacity to produce any thing perfect on the Subject, for want of knowledge as well as leisure. I only beg those worthy persons who are better qualify'd for the undertaking by a sufficient stock both of Learning and Time, not to be angry with me for having pointed out a new Subject, in which they may signalize themselves.

The following Treatise is a Collection of some Articles, which may enable us to judge of the Wealth of Rome both private and publick, in regard to the quantity of current Species of Gold and Silver. In considering of which, these things naturally occur.

First, The small quantity of the Treasure of Rome in its Infancy.

Secondly, What proportion of Treasure Rome in its Grandeur contain'd, in respect of the richest trading Cities at this time in Europe, which one may call its absolute Riches.

Thirdly, What proportion their circulating Species bore to the price of commodities, or number of Inhabitants, which one may call the relative Riches of Rome. In which sense it has been doubted if Rome could properly be said to be richer than some trading Cities now in Europe. But I believe the Reader will judge that it had the advantage in both Sense.

Fourthly, There is still another Consideration: That as, I believe, there was in the time of the greatest splendour of the Roman Empire, a less quantity of Current Species in Europe, than there is now, since the Discovery of the West-Indies; Rome possessed a much greater proportion of the circulating Species of its time, than any European City ever did, and so may be said likewise to be Richer in that third Sense.

The Reader will observe in the following Examples, that the quantity of wealth was very different in Rome in different ages: to shew which, I have in some places mark'd the Chronology upon the Margin. He will likewise observe the same precise Sums in different Articles; for example, some great Estates equal to a Farthing,
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Farthing, which proceeds from two Causes: First, The Romans reckoning as we do in round sums; such a one is worth a hundred or two hundred thousand Pounds: and secondly my being obliged to compute precisely according to the Tables.

I hope the Reader will not imagine that I vouch for the truth of every matter of fact. I only set them down as they are in the Authors, and compute the Sums as faithfully as I can. Calculation is the properest Method either to support Probability, or detect a Lye.

After all the care I have taken, it is possible there may be in such a multitude of passages, several misquoted, misinterpreted, and miscalculated, and a few I have taken from other Authors, who treated of the Subject. All I can say, the Reader will do himself a great deal of Service, and not in the least disoblige me, by setting any mistakes of this nature right.

I have in a few places, as the Subject gave me occasion, talked briefly of their Modes, Customs and Antiquities; about which I will likewise have no Dispute with the Learned, but submit most willingly to their Corrections.

I have been sparing in drawing Parallels or universal conclusions, my chief design being only to state matters of fact. Besides I think it more respectful to the Reader to leave him something to exercise his fancy and reflections upon, rather than pre-occupy his judgment. And indeed it is a Subject in which, matters of fact being stated, a man of business who is used to Calculation, is a better Judge than the best Classical Scholar in the world without these qualifications. I am afraid that in avoiding prolixity I may have fallen into the contrary extreme; the whole almost runs on short, like Articles in an Account: whereas if the Subject were fully explained, each of them might take up half a page. But mentioning the Sums without the Circumstances, was sufficient for my purpose.

The Collections I have made, and as I may say not only the Gleaning, but the plentiful Harvest that is left behind, will I hope one
Weights and Measures, &c.

one day furnish some able pen with Materials to treat the Subject in a more ample and accurate manner. I have done what the Extent of my Work, Health and Business would allow.

I was so tired out with Roman Affairs, that I could not go on so methodically with those of Greece; besides I doubt if there be so good Materials to work upon: so in these I have only collected a few detached Articles sufficient to exemplify the Tables.

I have produced likewise a few Examples out of the Scriptures, and any Reader who is curious may collect more. It is no Reflection on the Authority of the sacred Text that Errors in Numbers have crept into it.

CHAP. I.

Of Roman Estates.

The vast difference between the Riches of Roman Citizens in the Infancy and in the Grandeur of Rome, will appear by comparing the first Census or valuation of Estates that was made in the reign of Servius Tullius, with the prodigious Estates that they afterwards possessed.

*At the first foundation of Rome, 2 Jugera, or 1 English Acres was an Estate. Valerius Maximus tells us that Quintus Cincinnatus the Dictator (A. U. 292.) possessed 4 Jugera, 2½ Acres: and Atilius Regulus 7 Jugera or 4½ Acres (A. U. 498.)

Pliny (lib. 18. c. 3.) tells us that Manius Curius (A. U. 464.) said he took one to be a dangerous Citizen who was not contented with seven Jugera, which was the quantity of Land assigned the Plebeians after the Expulsion of the Kings.

And

* Plin. lib. 18. cap. 2. Bina tunc jugera populo Romano fatis erant, nullique majorem modum attribuit.
Tables of Ancient Coins,

And long afterwards M. Scarrus the first Senator had only six Slaves, and his Estate was reckoned 35 Millia nummum, or 282 l. 11 s. 0½ d.

At the first institution of the Census, the Valuation of Estates stood thus.

The 5th or lowest Class reckoned at Aëris Millia XI, 35 l. 10 s. 5 d.
The fourth at XXV Millia; 80 l. 14 s. 7 d.
The third at L Millia; 161 l. 9 s. 2 d.
The second at LXXV Millia; 242 l. 3 s. 9 d.
The First at C Millia; 322 l. 18 s. 4 d.

There was not a number amongst the ancient Romans beyond a hundred thousand. On the other hand, take but a view of the immense Estates of Roman Citizens in later times.

Apicius was worth millies Sesertium; 80729 l. 13 s. 4 d.
Crassus a Burgher of Vercelles, bis millies, 16145831. 6 s. 8 d.
Crassus the same; 1614583 l. 6 s. 8 d.
Demetrius, a Libertus of Pompej, 4000 talents; 775000 l.
Pallas, a Libertus of Claudius, ter millies; 2421875 l.
Seneca the Philosopher in four Years made ter millies; 2421875 l.
Lentulus the Augur was worth quater millies; 3229166 l. 13 s. 4 d.

Pliny relates that a private man, C. Cæcilius Isidorus, although he had lost much in the Civil war, left by will, 4116 Slaves, 3600 yoke of Oxen, of other Cattle 257000, and in ready money H.S. DC. that is sescenties Sesertium; 484375 l.

The Riches even of Exiles grew so extravagant, that Augustus, provided by a Law, that no Exile should possess above 20 Slaves and Liberti, nor in money above 12½ Myriads of Drachmae; 4036 l. 9 s. 2 d.

In.

Livius lib. 1.  f Plin. lib. 33. Non est quod antiquos numerus ultra centum miltia.
Seneca confolat. ad Helvium. e Verus Interpres Juvenalis.
Plin. lib. 33. cap. 10. g Plutarch. in Pompeio. h Tacitus lib. 12.
Ibidem. Qua Sapientia, quibus Philosphorum praecipit intra quadriennium regiae amicitiae termillies Sesertium paravit.
Seneca lib. 2. de Beneficiis.

Plin. lib. 33. cap. 10. C. Cæcilius Claudius Isidorus tettamentum suo editis, quamvis multa civilis bello perdissent, tamen relinquere servorum quiuomillias centum secederat; iuga bona tria millia sescenta, reliqui pecoris CC. quem qua quinginta septem millia: in numerato HS. DC.
Dion. lib. 56. μηδὲ νῦν ὃς αὐτοὶ ἧμεροι, τὰς ἐκκρούς χρήσεται, μὴ τῶν ὁμώνυμων ἡμῶν ἦσαν ὡς ἡμῶν μονοματίστα ἡμῶν.
Weights and Measures, &c.

In the time of C. Licinius the Consul, A. U. 376. the limitation of Estates was 500 jugera, or 330 English Acres.

And the old Law which allowed a man to possess no more in money than Sexaginta Sexsetnia, or 484 l. 7s. 6d. was changed by Julius Caesar, who allowed the Sum to be 51 Myriads of Drachms, or 16468 l. 15s.

The same gradual increase of Riches may be inferred from some accounts we have of Patrimonies and Women's Portions.

The Patrimony of Tacitus, reckon'd very great, was only X. M. æris; 32 l. 5s. 10d.

And even in the time of the second Carthaginian War, the Portions of Scipio's Daughters were paid in full by the Publick XI. M. æris; 35 l. 10s. 5d.

Megallia was styled the Fortune, because she had C. M. æris; 322 l. 18s. 4d.

In later times a common Fortune for a Lady was Decies Sexsetniurn; 8072 l. 18s. 4d.

Terentia, Cicero's wife, her Fortune was 12 Myriads of Drachms; 3875 l.

And Cicero's own Patrimony was 9 Myriads of Drachms; 2906 l. 5s.

Pomponius Atticus got from his Father vicies Sexsetniurn; 16145 l. 16 s. 8d.

Cato Minor his Patrimony was 100 Talents; 49375 l.

Servius in Virgil's life-saithe he was worth Centies H. S. 80729 l. 3s. 4d.

Tully's Estates must have been very considerable, as will appear by some things that will be said afterwards: "he owns that he had in Asia, bis & vicies, 17762 l. 9s. 4d.

Q 2

Great

Plutarch in Camillo. 0 Dion. lib. 41. εναρξάμενος ἐπιδέχατο τὸ πλῆθος τῆς Ὀλυμπίας-κρητίδος, ἦ μενοί ὁ ἐκχυμὸς ὁ ἀρέων, ἦ ἢ χρύ-σιος κοίλας. 1 Val. Max. Tacta. Ca-fonis filia, maximam dotem ad virum decem millia æris attulisse viva c. 2 Juvenal Satyr 10. Mart. lib. 2. Epigr. 65. Tacit. Annal. 2. 3 Plut. in Ciceron. 1 Cor-nelius Nepos. 1 Plutarch in Catone. 4 Ad H. S. bis & vicies Ego in Cifophoro in Asia habeo. Epist. ad Atticum lib. 11.
Tables of Ancient Coins.

Great debts, as they are the effect of great credit, are an indication too of great riches; some instances of which are as follow.

1. Curio is recorded for contracting a debt to the value of Sexcenties Sestertium; 483475 l.

2. Apicius, after having spent in his Kitchen millies H.S. 807291 l. 3s. 4d. and squander'd immense Grants and Pensions, being forced at last to look into his Accounts for the first time, found he had a small remain of Centies H.S. 80729 l. 3s. 4d. which thinking too little to afford the necessaries of life, he poisoned himself for fear of starving.

3. Tigellius a Singer could spend in five days Decies H.S. 80721 l. 18s. 4d.

4. One Mummius chastised by Martial for spending in less than a year his decies; 16145 l. 16s. 8d.

5. Macrobius speaks of a Roman Knight who could run in debt his decies; 16145 l. 16s. 8d.

According to a Latin Translation of Appian, Caesar's debt before he had been in any Office abroad, was 2018229 l. 3s. 4d.

But according to a various Reading in a Greek Manuscript of the same Author, it was 2500 Myriads; 807291 l. 3s. 4d.

Caesar himself owns, he wanted this Sum to be worth nothing; he had contracted this debt before he had any foreign Command.

Plutarch saith, that before he had been in any publick Office at home; he owed 1300 Talents; 251875 l.

6. Crassus was his Surety for 330 Talents; 160812 l. 10s.

7. Milo contracted debts to the sum of Septingentesies H.S. 565104 l. 3s. 4d.

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* decies centena dediiffes

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* Huic parco-pancis contento, quinque diebus Nil erat in loculis. Horat.

* Bisique tuum decies non totum tabuit anno, Dic mihi, non eft hoc Munnapere cito.

* Macrobius lib. 2. Saturn.

* Speriiior quia futuraesion me rende, substillegiturbus, Plutarct in Cæfare.

* Milonem sestertium septingentesies aëris alieni debuiffe, inter prodigia animi humani duco. Plin. 16. cap. 15.
Weights and Measures, &c.

*Antony at the Ides of March owed quadringentesies H. S. 322916 l. 13 s. 4 d. which he paid before the Kalends of April.

Plutarch tells us that Otho before he was Emperor, run in debt 5000 Myriads; 1602083 l. 6 s. 8 d.

I shall beg leave to make a few observations upon the Estates of some persons celebrated by Authors for their Wealth.

Tho' there has been much talk of the Riches of Crassus, they were inferior to those of Pallas the Libertus of Claudius. Crassus had left him by his Father 300 Talents, or 58125 l. which Plutarch faith he improv'd to 7100 Talents, or 1375625 l. and this Sum he had before he led his Army against the Parthians. He was reckon'd a covetous fellow, because he had a singular faculty of turning War and publick Calamities to his own profit. And yet he gave to the people at once a Tesseræ Annonaria trium mensium; a victualling Ticket for three Months.

He kept a great decorum in matters of Religion, for he consecrated the tenth of his Estate to Hercules, I suppose as Lewis the X1th did the Seigniory of Bologna to the Virgin Mary, that no body might touch it. He was likewise a great Encourager of Trade and Manufacture; for he educated, maintained and let out men of all Arts and Professions. He did not employ all his money in Usury, but purchas'd a very considerable Land Estate, according to Pliny. *In agris bis millies possedit, Quiricum post Sylvam ditissimus.*

So the valuation of his Land Estate by Pliny is 1614583 l. 6 s. 8 d.

I think as the World goes he was a good sort of man enough.

To compare his Estate with that of Pallas the Freeman of Claudius. The Reader must be inform'd that Claudius had two Freemen, Pallas and Narcissus. The first was a Rationibus, which I translate Privy-Purse: the second *ab Epistolis*, his private Secretary. Their Riches grew to a Proverb.

--- Ego

* Quadringentesies H. S. quod Idibus Martii desistit. Cicer. Phil. ada.  
  Plutarch in Antonius debet, ante Kalendas Aprilis debere | Craso.  
  Sueton. in Claudio.
Tables of Ancient Coins,

--- Ego possideo plus

Pallante & Licinis—Juvenal.
Nec Creni fortuna unquam nec Persica Regna
Sufficient animo, nec divitiae Narcissi
Indulgit Caesar cui Claudius omnia. Idem.

Pallas’s Estate, as the Reader may see before, amounted to £421875. And as a reward of his virtuous frugality, he received by a Senatus Consultum mention’d by Tacitus, and Pliny the Orator, Centes quinquages H. S. 121053 l. 15 s. which was razed out of the Records afterwards by Justinian. Sub Tit. de Senatus Consulto Claudiano. That Sum must be added to the former mention’d. There was another pretence besides his frugality for that gift, for he inform’d the Senate of the Slaves that lay with their Women, I suppose Wives and Mistresses. There is mention’d a third, one Calistus a Freeman of the same Emperor, perhaps he had got a Million.

It is an obvious Remark, from the particulars above mention’d, that the private Estates of Rome grew with their Dominions. The parts of a great thing are great, and there are proportionably large Estates in a large Country.

There were some of very low Rank and Professions, who acquir’d great Estates. Coblers, Dyers and Shoemakers gave publick Shows to the People.

Sutor Cerdo dedit tibi, culta Bononia, manus,

Vatinius a Shoemaker’s Apprentice gave to Nero himself a famous Spectacle of Gladiators at Beneventum, of whom Tacitus, faith Inter fædissima aula ejus ostenta fuit, satirae taberna alumnus, corpore detorto, facetiis scurrilibus, primo in contumelias asumptus, deinde op-

1 Tacit. lib. 12. Fixum est Ære publico millies possessor, antiquæ parsimoniae iussibus Senatus contultum, quo libertinus H. S. ter cumularetur.
Weights and Measures, &c.

Crispinus was an Egyptian Slave rais'd by Domitian, of whom Ju-venal Satyr 1.

Cum pars Niliaca plebis, cum verna Canopi
Crispinus, Tyrias hunero revocante lacernas
Ventilet, aftroon digitis sudantibus aurum.

Cynamus a Barber acquir'd a greater Estate than any Nobleman in Rome, and was at last condemn'd only to Equestrian Census, and banish'd into Sicily.

Qui tonsor fueras tota notissimus Urbe,
Et posthac domina munere factus Eques, &c.
Non Rhetor, non Grammaticus, Ludiue magister,
Nec Cynicus, non tu Stoicus esse potes:
Vendere nec vocem Siculis, plausumque Theatris,
Quod supersit iterum, Cynam, tonsor eris.

Licinius mention'd likewise by the Satyriff, as the old Scholiaf relates, was a young Slave, of so saving a Temper, that he let out the Offals of his meat to interest, and kept a Register of such Debtors in his Pocket-book; he was afterwards made a Collector in Gaul; where he acquir'd, as Persius expresses it, Agros, quantum Milvi volant, a Hawk's flight of Lands: for it should be read Agros instead of Nummos.

The riches and profusion of the Emperors are a Subject too large for the present Dissertatation. Claudius, as Eusebius relates in his Chronicle, employ'd 30000 Men for 11 years to drain the Fucin lake. The Reader will meet with several instances of the pro-
digality of the Roman Princes in the sequel of this discourse. The effect of which profusion was a proportional rapacity. Caligula had both qualities in extreme degrees; for, as Suetonius relates of him,
Tables of Ancient Coins,

him, he us'd to walk and roll himself on heaps of Money, nuidis pedibus spatiiatis, corpore volutatus. Nero gave one short instruction to his Tax-masters, Scis quid mihi opus est, hoc agamus ne quis quidquam habeat. What he had occasion for was, that no body should have any thing left. The Romans had a great many pretty words to express the pillaging of Provinces, *exsurgere, corraderere, deglubere, exoffare*, which we have hardly English significant enough to translate. Varro's Quibble I think was but an indifferent one. Cum sociis ita bellum geris, ut bella omnia donum auseras, alluding to their distraining the furniture of houses.

Thus in that great Empire Corruption begat Slavery, Slavery produc'd worthless and rapacious Favourites, those begat Oppression and Poverty; Poverty and Oppression Depopulation, and want of Zeal and Affection in those that remain'd, and from all these causes at last proceeded the final destruction of this mighty Empire. Corruption is a Cancer in the Body politick, scarcely admitting of any Cure, not even so much as Amputation.

CHAP. II.

Of the Prices of Bread-Corn.

THAT Rome in its Grandeur contained more Treasure and Wealth of all kinds, Citizens of greater Riches and Expenses than any European City ever did, perhaps will be readily granted; this, as I hinted before, may be called the absolute wealth of Rome.

As to the relative wealth of Rome, that is the proportion of circulating *Species* to the number of Inhabitants, or the quantity of Commodities, it hath been doubted whether Rome in that Sense were as rich as some trading Cities in Europe are at this time.

The
Weights and Measures, &c.

The middle or common prices of Commodities, which mankind have the same use for in all ages and times, seem to be the true Measure for ascertaining the quantity of circulating money in any time or place, and there is no other so proper as Bread-corn. I shall therefore give the Reader a short view of the price of Bread-corn as it was in Rome at several times.

Rome indeed by the care of the Magistrates was generally well provided with Corn, which was often given to the people for nothing, or at a very moderate price. * Minutius Augurinus the eleventh Tribune of the People, brought the price of Meal in three Markets, to an As for every Roman Modius, or 0 d. 3½ q.

Which, considering the difference betwixt our Peck and their Modius, will make per Quarter 2 s. 0 d. 1½ q.

Corn was given to the people at the same price by Manius Marcius, viz. per Quarter, at 2 s. 0 d. 1½ q.

But as I hinted before, this could not be reckoned a current price, because (as the quotation mentions) it was in a manner bestowed; besides it was in early days, when money was scarce.

* Clodius, when Tribune, made a Law, that Corn should be given to the people gratuit, which was before, sold the Modius for Semis æris ac triumibus, at which rate the Quarter comes to 16 s. 3 d. 2½ q.

* Cicero introduces Verres bragging that Wheat was at two Sesterces the Modius, which makes the Quarter 10 s. 2 d. 1½ q.

* He tells you, that there were two prices for the Corn bought up in Sicily, three Sesterces the Modius for the Decumanum or Tith-Corn, that is per Quarter 1 s. 5 d. 3 d. 1½ q.

And four Sesterces for the frumentum Imperatum, that is per Quarter 1 l. 0 s. 4 d. 2½ q.

R

The

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Tables of Ancient Coins.

The Tith-Corn, I suppose, was commonly raised at a certain rate, and the Imperium laid on by a certain distribution upon the several Cities, as occasion required.

1. *Verres* is accused for exacting *duodiums* *sextarii* in moenia singulos; this would bring the Peck to 1 s. 10 d. 3 ½ q. and the Quarter to 3 l. 1 s. 1 d. 2 ½ q.

2. Afterwards the same Author expresses the price of the Tith-Corn by the *Medimnus* *Georgicus* which contains six Roman *Modii*, which makes it per peck, 5 d. 2 ½ q. and per Quarter, 1 ½ s. 3 d. 1 ½ q.

He is so particular as to tell the Sum which was remitted to *Verres* for the *Frumentum imperatum*, viz. H.S. II. & trices, or 2583 l. 6 s. 8 d.

By the great acres of Riches and increase of money that happened afterwards, especially in the reign of *Augustus*, the prices of Corn as well as every thing else were raised at Rome.

*Tacitus* relates that after the burning of *Rome* by *Nero*, it was a great consolation to the people to have the price of the corn reduced to 3 *nummi*, viz. the Modius, or per English Peck, 5 d. 2 ½ q. This was the ancient price; and reckon'd very low at that time; for the prices of Flower and Bread mentioned by *Pliny* are much higher: he tells us that the Bread made of a *Modius* of coarse Flower cost 40 *Asses*; of that which was entirely purged from the Bran, or very fine Flower, 48 *Asses*; and what was made of the Flower of the *Silice*, or the finest of all, was double of the first. If we proceed according to our *English* manner, it will make the Peck of the cheapest or household Bread worth 2 s. 6 d. 2 ½ q.

That of the Wheaten Bread worth 3 s. 0 d. 2 ½ q.

And the finest 5 s. 1 d. 0 ½ q.

*Harduin* explains the words in the same passage of *Pliny*, *Panis vero e. modio Similaginis CXXII. e Floris modo CXVII. of so many*

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* Cicero in Verrina frumentaria. 8 H.S. frumenti minutum usque ad ternos nummos,*

* XVIII. Frumentum Sicilientce ex lege ultima* Tact. Annal. 15. * Pretium haec annona* *modia in modios farinae, XL asses: similaginis*

*Verri decretum in frumentum imperatum in annis singulos. Cicero ibid.* 1 Pretiumque *calitate octoginis* *affitus amplius, filigini castrata*

*pretium* *duplicem. Plinius lib. 18. cap. 10.*
many pound weight of Bread, but the passage must be either
erroneous in the numbers, or mean something else, for in the para-
graph before, Pliny speaking of the weight of Bread that could be
made of a Modius of French and Italian Flower, hath this Pas-
fage, Silaginea farina modius Gallica XXII. libras panis reddit, Ita-
lica duabus tribusve amillis in arsotricio pane. Therefore CXXII
pound of Bread of a Modius of Flower is an impossibility, the C
is either redundant, and it should be read XXII pound; or some-
thing else than Modius must be understood.

The English Bakers make of a Peck of our Flower 18 pound
of Bread at most. The weight of the Peck loaf by the Lord Ma-
yor's order is 17 lb. 5 oz. 1 dr. Arverdupois; supposing eighteen
pound Arverdupois made of our Pecks, according to the Roman
Measure and Weight, it will make of the Roman Modius, about
24 Roman Pounds, which agrees with Pliny's account.

The Aflizze of Wheaten Bread in London is pretty near as 3 to
5, that is, when Wheat is 15 pence the Peck, the Peck loaf is
sold for 25 pence. The price of the middle sort of Bread, which
answers to our wheaten, according to Pliny, is 3 s. 0 d. 2 1/4
which, reckoned according to the forementioned proportion, will
make Wheat per Quarter at 3 l. 3 s. 6 d. as the common or
middle price.

The great difference of the several prices of their Bread, much
exceeding the difference of the prices of ours, proceeded from their
great delicacy in Bread, and perhaps something in their manner
of baking. Pliny reckons four sorts of Bread, the Ostreacii, or
Loaves baked with Oysters; Artolagi, which answered to our
Cakes; Speustici, a coxewa, from their quick way of preparing; and
Artopticii such as were baked in Ovens, called so from the fur-
nace in which they were baked.

The passage above mentioned is to be understood of this last Bread.

By the last prices of Bread, it seems that about the time when
Pliny wrote, Corn was considerably dearer in Rome than commonly
at London; and it is evident that the prices of commodities were
Tables of Ancient Coins,
low in early Times, and rose gradually in Rome by the encrease of Money, as they have done in France, England, and other Countries of Europe.

C H A P. III.

Of the Price of Wine.

WINE seems to have been always cheap at Rome. There is in Pliny a remarkable passage concerning the price of Wine; he states in the Consulate of Opimius, A. U. 633, there being an excellent Vintage, Wine was laid in according to the rate of that time at 100 Nummi the Amphora, (which containing seven Gallons, and one Pint; 10.66 solid Inches) or, 16 s. 1. 3. this will make it per English Hogshead, 7 s. 10 d. which is a higher price than some that are mention'd in other Authors.

Pliny proceeds, and reckons when this Wine was drank 160 Years afterwards, by reason of the interest of money which was 6 per Cent. it came to two Nummi the Cyathus, or 3 d. 3. 9.

This passage is not only curious on the account of the price of Wine, but it is an instance of the Roman manner of computing interest at that time, which was neither simple nor compound interest reckon'd at every term of payment, but of a lower Rate; for after 101 Months they added six per Cent. to the Principal, besides the simple interest that was due upon the Sum, which they called Anatocismus; so it is named by Cicero. To examine whether Pliny reckoned right: in 160 Years there are

1 Opimio Consul, cum C. Gracchus Tribunus plebem seditionibus agitans interemptus: esse ieiuniques fulsit, quam coeñuram vocant, solis opera, natali Urbis 533. Durantque adhuc vita ducens fere annis, jam in speciem redactâ melius apert. etenim haec natura vinis in vetrâ fuscâ esse; nec potari per se queunt, si non pervincat aqua, ubi in amatitudinem caris indomita. Sed ceteris vinis commendandis minima aliqua mixtâ medica mensante: quod ut ejus temporis adfimatione in singulas Amphoras centen. nummi flatumur, ex his tanen, usus multiplicata semissibus, que cælitis ac modica est, in Caii Caesaris Germanici filiui principatu, anno 160. Singulas uncias binis (ita Budæus legit) consititisse, nobili exemplo docuimus.
Weights and Measures, &c.

192. Months, which if you divide by 101, it gives 19 Anatocismi, which makes the Sum due by the Anatocismi 114: 100 Nummi, principal and interest at 6 per Cent. after 160 years, make 1060, to which if you add 114, it makes 1174. There are 576 G drip in an Amphora, which at 2 Nummi the Gripps, make 1152 Nummi, which want only 22 Nummi of the Sum. And if you reckon that 6 per Cent. to bear Interest 18 times, it will add 17 Nummi to the Sum, which make it only 5 Nummi short of Pliny's account.

This would make the English quart of the vinum optimun amount to 13 s. But this proceeded from an accidental reason of the interest of the money first laid out.

The prices of Wines at the vineyard were much lower than that of the Opimium, * for Columella saith, that the very worst sort of Vineyards would produce per Jugurum, a Culeus of Wine; that is, about 1 of an English Acre produced 143 Gallons and 3 Pints; which was sold for 300 Nummi, that is 2 l. 8 s. 5 d. at this rate the Hogshead comes to 1 l. 10 s. 11 d.

But it must be considered that this is at the Vineyard, the worst Ground and the worst Wine. It will be fair to reckon double that price for the common Wine, or about 8 l. per Ton.

* Cicero states the Custom exacted for Wine at Toulouse, 4 Nummi the Amphora, which per Hogshead comes to be 1 l. 2 s. 8 d.

There are very low prices mentioned by Authors, as that by * Martial, making it per Gallon about 2 d. and Corn a Peck at 3 1 d.

But those are mentioned as extravagantly cheap, and poetically.

There are likewise recorded times of prodigious plenty, which cannot be drawn into any Rule, as that specify'd by * Pliny, when 12 Pounds of Oyl was sold for an As; and likewise at the Triumph A. U. 600, ofMetellus, when near an English Gallon of Wine, 30 Roman Pounds

* Quippe ut determi generis sunt vindex, ta

* Quaterni

* Denarii in singulas Amphoras portorii nomine exadi Toloiffe. Cic. pro M. Fontio.

* Amphora vigesim Modius darur Oere quaterno. Mart.

* Plin. lib. 15. cap. 3.
Tables of Ancient Coins.

Pounds of dried Figs, ten pound of Oyl, 12 Pounds of Flesh, and, a Peck of Meal, were sold each at an As, or 3 1/2. A

Anno Urbis 675, Greek and Aminium Wines were forbid to be sold for 8 Asses the Quadrantal, or Amphora, that is for less than one penny the Gallon; but this was for a particular reason.

CHAP. IV.

Of the Price of Cattle.

I can discover very little of the price of Cattle amongst the ancient Romans. In early times the price of a good Calf, was 25 Asses, 1 s. 7 1/2 d.

The price of a Sheep, a Denarius, or 7 1/2 d.

The price of an Ox ten times as much, that is 6 s. 5 1/2 d.

But these prices must have been afterwards very much increased for Varro speaking of the price of a Peacock, faith that it was above the price of a Sheep, which at least is an argument that a Sheep was not much short of the price of a Peacock, and this was 50 Denarii, or 1 l. 12 s. 3 1/2 d.

The Roman Fines or Penalties exacted by Law had still a Relation to those original prices of Cattle, and were very gentle at first, and continued still to be so from the nature of their Government. Their effects at first consisted chiefly in Cattle, publick plunder retained the name of Peculatus.

The lowest fine of all was a Sheep, or 7 1/2 d.

The Fine for a private injury, a Calf, or 1 s. 7 1/2 d.

The


Epicharmus apud Pollucom, Fellus Pompeius.  

† Esque cum creverunt (pullos nempe pavonum) quinquagenis denaris vendit, ita ut nulla ovis hunc aequali frubcm.

Weights and Measures, &c.

The rate of the highest fine was to Oxen, and two Sheep, or 3020 Asses, that is 9l. 15s. 0½d. from which Gellius observes, that Oxen were more numerous than Sheep, and I am told it is so at this time in Italy.

The regard had to that rate of fixing, was consider'd even in the time of Justinian; for the Judges under Proconsular Authority were forbid to fine above a Quadrans of a pound of Gold, which according to the value at that time was 9l. 15s. 0½d.

Those who had Proconsular authority, could fine aurum semissen, or double the former Sum. It was allowed to the Prefectus Praetorii to fine as far as 50 pounds of Gold; not so much with regard to the Dignity of his office as the Atrocity of the fact.

Gellius tells us, there was an exception from the usual gentle rate of fixing in the case of a Lady, who for the incivility of her Speech was fined XXV. M. æris X millia 80l. 14s. 7d.

Sestertiorum X millia was likewise the Fine for laying one's Tail in the Fountain of an Aqueduct, making 80l. 14s. 7d.

Cities were fined pretty high: Rhodes by Brutus was fined 500 Talents, 96895l.

I have been induced by the price of Cattle to say so much of the rates of Fines, from this small relation it had to the subject of Cattle.

To return to the price of Cattle: As to horses, Livy tells us that there were 10000 Asses given out of the publick money to the Equites to buy horses, and that the Widows were oblig'd to contribute towards their keeping the Sum of 2000 Asses yearly.

If, as it is commonly supposed, there were two horses, the price of them was 32l. 5s. 10d. or, per Horse, 16l. 2s. 11d.

And

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* Gellius, lib. 11. Nostium Atticarum.
* Lege ultima de modo mulctarum in Codice Justiniano.
* æris gravis XXV millia. Id factum bello Punico primo.
* Sestertiorum dena millia multa esto, si quis aquam Aquaductus dolo male olearet, ubi publice falit. (Plut. in Brut.)
* Ad equos emendos dena millia æris ex publico data, & quibus equos aereum, vidimus atribuisse, quae bina millia æris in annos singulos pendent. Livius lib. 1.
Tables of Ancient Coins,

And their feeding came yearly to 6l. 9s. 2d. which is per
Horae, 3l. 4s. 7d.

These seem to be pretty high rates for that time, tho' much
inferior to the prices of horses afterwards. \(^1\) Gellius mentions one
sold for 100 Sestertia, 807l. 5s. 10d.

\(^*\) The price of Bucephalus was 13 Talents, 2518l. 15s.

\(^1\) Pliny relates from Varro, that a Jack-As for a Stallion was
bought for 3229l. 3s. 4d. \(^*\) And that in Celtiberia, a Prov-
ince of Spain, a She-As has brought Colts to the value of
3229l. 3s. 4d.

\(^*\) Varro's price indeed is much inferior to that of Pliny, he speaks
of an As sold in his own time at Rome, for 60000 H.S.
484l. 7s. 6d.

By the above-cited passage of Varro, it appears that the price
of a Sheep was somewhat under that of a Peacock, \(\text{viz.}\) 1l. 12s.
3½d. Suppose we fix it at 25 Shillings a Sheep, or 25 Pound
the Score; according to the fore-mention'd proportion of a Bul-
lock being ten times as dear as a Sheep, the price of one will be
12l. 10s. and that of a Calf will come out 3l. 2s. 6d. since
it was 1s. 7½d. when the price of a Sheep was 7½ pence, or
as 5 to 2. This will make the price of Butcher's meat in Varro's
time not much different from what it is in London.

\(^1\) Gell. lib. 3. cap. 9. \(^*\) Gellius lib. 5. cap. 2.
\(^1\) Plin. lib. 8. cap. 43.\(^*\) Plin. CCC.C.C.M nummum emptum, Quirino
Senato, autorem est M. Varro, haud fecit an-
omnium pretio animalium vieto. \(^*\) Plin. \(\text{ibid.}\)
\(^*\) Varro lib. 2. cap. 1. Tertia pars
Hoc nomen enim Asini Arcadici in Graecia nobilitat, in
Italia Reatini, quae esset, ut mel memorià aff-
venerit sexta maribus millibus LX.


C H A P. V.

Of the Roman Expences in Eating.

We have been able, as appears by the former Chapter, to discover somewhat, at least by inference, of the common prices of Butcher's meat; and as to Fowl and Fish, Authors take little notice of the common prices, but only mention those that are extravagant.

I find that Tardi, fat Birds, which we commonly translate FOWL. Thrushes (but of which there are several sorts) were sold a-piece at 3 Denarii 1s. 11d. they were in great reputation, and used in Feasts.

Peacocks were sold dear, the price of one was 50 Denarii, 1l. 12s. 31d.

A flock of a hundred was sold at a much dearer Rate, for XL M. H.S. or 322l. 18s. 4d.

One of their Eggs was worth 5 Denarii, 3s. 24d.

M. Ausfidius Larco used to make every year of his Peacocks 60000 H.S. or, 484l. 7s. 6d.

Varro saith he has known 5000 Tardi come from one Farm in a Year, which according to the foremention'd price are worth 484l. 7s. 6d.

Commonly fine Doves were sold the pair at the same price with Peacocks, viz. 200 Nummi, or 1l. 12s. 31d.

Others of a finer kind were much dearer. Varro relates that Axius refused to give a pair of his under 400 Denarii, 12l. 18s. 4d.

When

a Atque in hac villa qui est ornithon, ex eo uno ducenis nummis, nec non eximia singulis mil-quinquemillia scio venisse tundorum denaris tertiis, ut ferengia millia ex pars reddiderit cozmo villa. Varro lib. 3. cap. 2. idem minoris quadringentis denarior um nega-
lib. 3. cap. 6. Paria singula vulgo veneunt vit. Varro lib. 3. cap. 7.
When the Merchant who was buying them, offered 1000 Nummi, 8 l. 1 s. 3 1/2 d. But these were valued so highly for Plausine, rather than the Table.

Augustus Caesar bought the Crow that saluted him as he was returning from Aleum, a pennyworth at 20000 Nummi, 16 l. 9 s. 8 d.

A white Nightingale was bought at 6 Sesteria, 48 l. 8 s. 9 d. for a present to Agrippina, Claudius's Wife.

Goose Down was sold per Pound for 5 Denarii, 3 s. 6 d.

The Romans were more extravagant in the prices of their Fish, than of Fowl. Juvenal tells you of a Mullus (which is supposed to be what the French and we call Sormoulet) bought for 6000 Nummi, 48 l. 8 s. 9 d.

According to Macrobius there was paid for another 7000 Nummi, 56 l. 10 s. 1 1/2 d.

For a third, according to Pliny, 8000 Nummi, 64 l. 11 s. 8 d. which he reckons the more wonderful, the Mullus being a Fish that seldom exceeded two pound weight. These are not to be reckoned common prices; but as they were the effects of great Extravagance and Luxury, they were indications of great riches, at least among the people of high rank.

Fishes at Rome, like Toasts, were sometimes in vogue, then wore out by length of time, and succeeded by others.

Thus the Acipenser or Sturgeon was dethroned by the Scarus, and the Mullus or Whiting by the Murena. However the Acipenser had still some Honour paid him, having the Haurboys marching up before him, and being carried by people with Coronets on

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1 Sueton. in August. 2 Sest. 3 Sesteria fer., candidam [Lucrinam] alioqum, quod est prope Ipsustium, vacilla, quae Agrippinae Claudiae Principis conjugi dono daretur. Plin. lib. 10. cap. 29. 2 Plin. lib. 10. cap. 22.
4 Macrobi. lib. 3. cap. 16. septem millibus.
5 Plin. lib. 8. cap. 17. 990 millibus annumm.
Weights and Measures, &c.

on their Heads to the Table. (Ut Acipenserum inferrent Crohatis cum centri Tivius) Notwithstanding the great reputation of the Scarrus, the Mullus kept his ground among the polite. Varro owns that you might sooner get the best Team of Horses out of Hortensius's Stables, than a bearded Mullus out of his Ponds.

The Tripesamum, which we shall translate Triplet, was the chief eating according to Fenestella, which consisted of the Lamprey, the Lupus Marinus (not our Pike as we imagine) and the Myxus another fish, which hath no English Name. There were serv'd up together in one machine with three Bottoms. Much may be said in honour of the Murana, or Lamprey.

C. Hirtius, the most famous Roman for Fish-ponds, thought his Lampreys inestimable; he would not sell, but lent six thousand of them for Cesar's Triumphant Supper.

Lucius Crassus, a Man of Censorial Dignity, went into Mourning for a deceased Lamprey; and Vedius Pollio a Roman Knight, a great Friend of Augustus, fed his Lampreys with his condemned Slaves, and yet he was celebrated for a good-natur'd man.

Our Age is as yet unacquainted with the niceness of the Ancients in weighing their Fishes at Table, and beholding them expire. The death of a Mullus with the variety and change of Colours in its last moments, was reckon'd one of the most entertaining Spectacles in the world.

It is some honour to our Nation that the Sandwich Oysters were famous (Rutupino de fundo) but I cannot discover what they were a Barrel.

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Circius nasa forent am
Lucerum ad factum Rutupineque edita fundo
Oltre . . . . . .


The Romans were in as great favour with their Fishers, as their Fishes were with them: no body could say they were deaf, for they would come when they were called.

A Lady bestowed Earings upon a favourite Lamprey.

After what I have said of the great value the Romans put upon Fishes, it will not appear incredible that C. Hirrius should sell his Fish ponds for Quadrages H.S. 32291 l. 13 s. 4 d.

And that Lucullus's fish, after his death, should be sold for the same, viz. 32291 l. 13 s. 4 d.

It will not be impertinent to the present subject to make honourable mention of Fulvius Hirpinus, who was the first that made a Nurserie for Snails, and fed them so well (farre & sapis) with bran and boil'd wine, that the capacity of the Shells of some of them amounted to 80 Quadrantes, or 20 Sextarei, that is about 10 Quarts.

As to the price of fruit, we know that peaches were sold first for a Denarius 7 4 d. And they rose afterwards to 30 Nummi, or 45. 10 d.

Cherries were brought out of Pontus by Lucullus A.U. 680, and were brought into Britain 120 years afterwards, which makes it Anno Dom. 55. But I cannot find what they were a hundred.

Large Asparagus was sometimes sold a-piece for 6 d. which will make them amount to 2 l. 10 s. per hundred.

But the Ravenna Asparagus was as large as our Battersea Asparagus, weighing four ounces a-piece.

The forementioned particulars will dispose the Reader to believe that the Romans were as extravagant in their eating in the last Days.

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Weights and Measures, &c.

Days of their Commonwealth, as they were frugal in the beginning of it. For in early times they were allowed only to lay out on festival days 30 Asses, 1s. 11¼d. on eating; They were allowed to lay out on a Supper no more than 100 Asses, or 6s. 5¾d. (besides the product of the ground, that is, Bread, Drink, Roots, and Legumes,) whence they were called Centenaria Cena. And Lucilius the Poet from his manner of living was named Centuress. *Cato the elder never spent more than his Allowance of 30 Asses on a meal. But they arrived by degrees to an incredible extravagance. *Heliogabalus laid out on a Supper tricies H. S. 24218l. 1s. 5s.

*Caligula spent on a Supper Centesies H. S. 80729 l. 3s. 4d.

*Vitellius in eating and drinking, within the Year, spent 22500 Myriads of Drachms, 7265625 l.

*Tacitus faith, that he spent the same Sum in a few Months, viz. 7.265625 l.

*Lucullus's establishment for his Suppers in the Apollo, was 50000 Drachms, 1614 l. 1s. 8d.

*Claudius Æsopus the Tragedian had one dish that cost him 600 Septertia, 4843 l. 10s. In which, to enhance the price of it, he had put singing Birds.

*The young Captain, his Son, treated his Guests with costly Pearls, a Pearl for ev'ry Guest made into Pearl Cordial.

It may seem somewhat difficult to make out the Bills of fare for some of the forementioned Suppers, especially those of Vitellius. I question not but an expert Clerk of a Kitchen can do it from the following hints.

*First, his Imperial Majesty eat four times a-day; no Supper, Breakfast or Collation under 40000 Nummi, or 3229 l. 3s. 4d. and

terunt.
Tables of Ancient Coins,

and by way of preparation for the next meal he took gentle Empe-
ticks between them.

His Brother once gave him a pretty costly Supper, in which
there were two thousand of the choicest fishes, seven thousand of
the choicest Birds; one dish for its amplitude and capacity was
called Minerva's Buckler, which consisted chiefly of the livers of
Scari, the brains of Pheasants and Peacocks, the tongues of Phen-
icopters, and Lamprey's Bellies brought from the most distant
Coasts in Triremes. Now the Reader must understand that the
Scarus was first in repute amongst fishes, and generally cost the value
of a Principality. Next to that was the Mustella, and after that
the Mullus, which cost sometimes about 6.4 Pounds.

The Roman recumbent or (more properly) accumbent posture
in eating was introduced after the first Punic War: and no doubt
occasioned by their eating immediately after Bathing. The Tables
were low amongst the better sort, made of Citrus or some pre-
cious wood, with three Ivory Feet, cut in the Figure of a Lion's
or Leopard's Paw. About the Table there were three Beds at
most: after the time of Vespassian, there were often but two; from
whence they were called Biclinia; and the Table was in the figure
of a Semicircle, from which it was called Sigma; the Space before
was open for the Waiters. In both sorts of Tables, the Beds
were cover'd with magnificent Quilts, amongst the richer sort.
After bathing they put on their Vestes Cenatoria, Garments that
were made to eat in. It is plain that this manner of eating was not
only inconvenient, but impossible for a great number of Guests
at the same Table; and yet there were twelve at a famous Supper
of Augustus, mention'd by Suetonius, from thence called dux
Vindecas. So that the common opinion is not true, viz. that L. Verus
was the

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* Sueton. in Vitellic, cap. 13. Famofiflina super castas fuit coena ei data adventicia a fra-
tre; in qua duo militia lefifilorum pisetum, septem avium apposita traduntur. Hanc quo-
que exfuperavit ipse, dedicatione patinae, ob

immensam magnituationem Clyperum Minerva,
Weights and Measures, &c.

tidcal Supper mention'd by Macrobius, there were 10 at two Ta-
bles; the Guests lay on their left Side, leaning on their elbow, with their Heads supported by Pillows. When there were more than one on the same Bed, they did not lye as we on our Beds, but so, as the Feet of the first person reached to the Back of the se-
cond, and so on. The most honourable place was the upper-
most, or head of the bed, except when there were three persons
on one, and then the most honourable place was the middle. It
was thought indecent at first for women to eat with men after
this manner, but it was easy to imagine that time must either
abolish the custom, or conquer their modesty. In nuptial and
other solemn feasts, where the Guests were numerous, there were
several Triclinia in the same Room, and yet they could not enter-
tain conveniently so many as dine often in our great Halls.
Therefore their way of eating must have been, generally speaking,
more private than ours, and on that account les expensive. And
the reflection of Varro in A. Gellius, that the number of Guests
should begin at that of the Graces, and end with that of the Mu-
es, from 3 to 9, was not only true, but agreeable to the Cha-
acters and Manners of the People. As for their Napkins, Helio-
gabalus had those of Cloth of Gold, and Galienus too, as Trebellius
relates: but they were most commonly of Linnen, some of soft
Wool; as Trimalcion's, qui non linteis tangebatur, sed palliis ex mol-
liifima lana factis. In some Banquets the Guests brought their own
Napkins.

There is a description of the magnificent and expensive man-
ner of eating of the ancient Romans, Greeks and Barbari-
gans, in Philo Judaeus, de vita contemplativa. It is too long to in-
sert here, but some of the particulars which he mentions are, Beds
adorn'd with Ivory, Tortoise-shell, Pearls and precious stones; Ma-
telles of Purple interwoven with Gold, adorn'd with Foliages and
Flowers; vails Side-boards of drinking Cups, and Vases of the rich-
est workmanship: being serv'd with handsome young Boys, paint-
ed, scented, and finely drest'd: seven changes of Tables, and some-
times
times more, served up with the greatest delicacies, that Earth, Sea
or Air could afford. It was the custom then to change the Ta-
bles with the Courses or Services.

They liv'd upon the same sorts of Flesh and Fish as we do, only
they had no Turkeys. We have mentioned some of the Fishes
that were in greatest request, as the Sturgeon, Scari, Lamprey, Lu-
pus Marinus, &c. Athenaeus lib. 1. cap. 4. acquaints us, that
Sicilian Lamprey Eels, πλαγωται, that is floating, (perhaps in opposition
to muddy,) the Belly of Tunny Fish taken at Pachymus, Kids from
the Island of Melos, Mules from Symetum, Shell-fish of Pelorus,
Herrings of Lipara, Radishes of Mantinea, Turnips of Thebes, Beets
from Asora, were in greatest esteem. They had a great variety of
Cakes, as Placenta, Laganum, Libum, Scribile, Spherita, Crastia-
um, Sirutum, Crastulum. Each of which may make a very good
Subject of a Dissertation for an Antiquary; as also whether they
had Pyes. One may judge of the art of their Cooks from this,
that they could make artificial Birds and Fishes, in Default of the
real ones, and which exceeded them in the exquisiteness of the
Taste. Nicomedes King of Bithynia, longing for Herrings, was
supplied with fresh ones by his Cook, tho' at a great distance from
the Sea. Trimalchus's Cook could make out of Hog's Flesh all
sorts of Fishes and Birds. They were much addicted to boiling
and roasting with Puddings in the Belly. Athenaeus speaks of a
Cook that could dress a whole Hog in that manner. I refer the
Readers to the Writers on this Subject, for accounts of their
Pickles and Sawces. They made a very savoury one of the In-
trails of the Beasts which they dress'd.

Their Tables seem to have been more delicate than abundant;
There is a Bill of Fare, and the Company recorded, in Macrobius
lib. 2. cap. 9. who took it out of the Records of the High-Priest
Metellus. It was the Inauguration Supper of Lentulus, when he
was made Flamen Martialis, Priest of Mars. The Guests were all
Sacred persons, Priests and Vestals. There were ten Men in two
Trichina, viz. Lentulus himself, Q. Catulus, M. Aemilius Lepidus,
D. Silanus,
Weights and Measures, &c.

D. Silanus, C. Caesar Rex sacrorum, P. Scævola Sextus, Q. Cornelius, P. Volumnius, P. Albinovanus, and L. Julius Caesar the Augur. In the third Triclinium were Popilia, Perpennia, Licinia, Aruntia, Vestals; and Publicia Flaminica his Wife, and Sempronia his Mother-in-law.

The Bill of Fare follows, at the Inauguration Supper of Lentulus.

Ante Coenam.

Before Supper, or the first Course.

Echini;
Ostreae cruda, quantum velint,
Peloride,
Sphondylis,
Turdi,
Asparagi,
Substus Gallinam altilem.
Patina Ostruarum,
Pelorides,
Balani nigri, §
Balani albi, §
Iterum Sphondylis,
Glycomarida,
Utrica Ficedula,
Lumbi Caprages,Aprugni,
Altitia ex farina involuta,
Ficedula,
Muries, &c. §
Purpurea. §

Shell-fish, prickly like a Hedgehog.
Raw Oysters, as many as they pleas'd.
Cockles, so call'd from Pelorus in Sicily.
The grilly parts of Oysters,
Thrushes,
Asparagus,
Under a cram'd Fowl.
A plate of Oysters.
Cockles.
Another Shell-fish, shape'd like an A-corn.
The grilly part of Oysters a 2d time.
The largest kind of Cockles.
Beccaficos.
Chines of a Goat and Boar.
Fat Birds in paste.
Beccaficos.
Two sorts of Shell-fish, of which the purple Dye was made.

In Coena.

At Supper.

Sumina,
Sinciput Aprugnum,

Dugs of a Hog.
Boar's Cheek.

Patina
Tables of Ancient Coins,

Patina Pisium,  A Dish of Fish.
Patina Susinis,  A Dish of Sow Drugs.
Anates,        Ducks.
Quinquecula clava, Boiled far Birds.
Lepores,       Hares.
Alfia Assa,    Cramm'd Birds roast'd.
Amylum,       A Pudding.
Panes Picentes, A sort of Cakes.

In answer to some who have doubted whether it were possible for Vitellius to spend 7.265625l. in eating and drinking within the Year: I will suppose his Establishment to stand thus,

For the ordinary of his Table, four meals a-day, at the rate of 32.29l. 3s. 4d. per Meal in a Year; 4.714583 6 8
For the Extraordinaries of Pallas's Buckler 765625 0 0
For his other Tables and Contingencies 1.795416 13 4
Sum Total 7.265625 0 0

With very good Clerks of the Green-Cloth this Sum might have serv'd a Year, but with bad Management, it's no wonder it was spent much sooner.

As I intend to deal candidly with my Readers, I would not willingly lead them into any mistake about a matter of such consequence as Aesop's Dish above-mention'd, neither would I incur the Displeasure of learned men, who in their Discourses about this Patina have fallen into indecencies, which nothing but the Dignity of the Subject could excuse. Gronovius has corrected Pliny three times, and Tertullian once in this matter, with a great deal of Judgment. Hotoman has taken Budaeus to task, and Gronovius refutes them both. Manuscripts have been oppos'd to Manuscripts. As for my pass, I invoke the aid of all great Critics to assist me, before I give my Judgment
Weights and Measures, &c.

Judgment in so important a matter. The passages which commemorate this famous Patina, as they are commonly read, are First, Plin. lib. 10. cap. 51. Maxime tamen insignis est in hac memoria, Claudii Aesopi Patina sexcentis sestertiiis taxata, in qua posuit aves Centum aliquo aut humano sermone vocales, Nummis sex singularis coemptas. Plin. lib. 35. cap. 12. Nam nos, cum unam Aesopi Tragediarum Historiam, in natura avium dicoremus, sestertius C. fsetiis, non dubito indignatos legentes. At Hercules Vitellius in principatu suo C. C. sestertius condidit patinam, cui facienda fornix in campis exceditata erat, quoniam eo pervenit Luxuria ut etiam fictilia pluris constant quam Murmnia. Tertullian. de Pallio cap. 5. Gulam quid Asinius Celer unius Mulli obsonium sex sestertiiis detulit, qua Aesopus Historix ex Avibus ejusdem pretiositatis ut canoris & liquacibus, quibusque Centum millium patinam conscripsit. In order to set right, what has so unhappily divided the critical World hitherto, I hope the Learned will give their opinions upon the following points.

What they think of Budeus’s Reading of Millibus sex singulas for Nummis sex: consequently whether this Patina was Centenaria, of 100 Birds; or else, that each Critick will send in his number of Birds?

Whether the Value of the Dish itself is only expressed, which the learned Hotomatus hath contended for with great warmth?

Or whether the Dish and the Birds are valued?

And what they think of Salmasius’s Opinion, which he has defended strenuously, and fallen foul of Budeus; viz.

That Pliny affirms three things, that Aesop’s dish was earthen Ware, that it cost 100 Sestertii, and that it is the workmanship that is valued, and not the Birds, which perhaps were not worth a Shilling a-piece. I cannot come into this rash Judgment, founded only on the comparison of Aesop’s Dish with that of Vitellius, where undoubtedly the workmanship is meant.

Tertullian has certainly confounded the whole very much; and the words ejusdem pretiositatis may refer either to the preceding example of Asinius Celer, or the Birds; as if he had Birds of equal


two
Tables of Ancient Coins,

price with singing Birds. Another question ariseth, whether the common Manuscripts are wrong in reading Ex instead of Sex: from all which strong Arguments, Gronovius has taken it upon his Salvation that there were no more than six singing Birds, each worth Centum millia, or a hundred thousand, and consequently the whole Dish must be worth six hundred thousand, or 48,431. 15 s.

But I own the matter appears still so intricate to me, that I must beg the Opinion of the Learned upon it.

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CHAP. VI.

Of the Prices of Cloaths.

As to the Prices of Cloaths, we may infer that amongst those of great quality they were high, from the following matters of fact.

* A Roman Pound of Padua Wooll has been sold for 100 Numeri, 16 s. 1 1/2 d. at this rate the English pound Troy comes to 17 s. 8 1/2 d. but this is an extraordinary price, and for the very finest Wool, as the Padua Wool is yet reckoned.

+ Bassus is reproached by Martial for buying upper Garments for 10,000 Numeri, 80 l. 14 s. 7 d. whereas Catu the Elder never wore a Suit above 100 Drachmas, 3 l. 45 s. 7 d.

The Purple was very dear; there were two sorts of Fishes whereof it was made, the Pelagii, (which were those that were caught in the deep) and the Buccini. The Pelagium per Pound was worth 50 Numeri, 8 s. 10 1/2 d.

And

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* Plin. lib. 9. cap. 47. Centenos nummos libra Lame alba circumpadam ad hoc sevi non excessit.  
+ Plutarch. qui ilia mercatur immenso.
Weights and Measures, &c.

And the **Buccinum** double that, **viz.** 17s. 8d. **Harduin** reads a hundred Pounds at that price.

But whatever the price of the Fifth was, the Cloth was very dear. *The Violet Purple* was **per** Pound of dy'd Wool or Cloth 3l. 10s. 11d.

*The Tyrian* double Dye **per** Pound could scarce be bought for 35l. 9s. 1½d.

*Pliny* tells us that to dye 50 pounds of Wool, was required 200 pounds of **Buccinum**, and 110 pounds of **Pelagium**. According to this proportion, and the prices of **Buccinum** and **Pelagium** above-mentioned, the Dying of one **English** Pound of Wool, would cost 4l. 10s. 5d.

*There was an Indian Purple at 7s. 1⅞, per Pound as appears by *Pliny*, who likewise mentions several other sorts of cheap Dyes.*

*There is one piece of extravagance mention'd by the same Author, which was their dying the Wool upon the Sheep's back.*

It appears by a Tax of *Cato's*, that the Ladies began pretty early to be extravagant: it was provided by that Law, that Women's wearing Cloaths, Ornament and Sedan, exceeding 121 l. 1 s. 10½d. in value, should pay 1½ per Cent. or 30 Shillings in the hundred pound value. If this Law had continued in force in the time of *Lollia Paulina*, she must have paid for her Jewels only 484 l. 15 s. for when dressed out, she wore about the value of 3229 l. 13 s. 4d.

*Lampridius* faith that **Heliogabalus** was the first man who wore a Garment entirely of Silk. *Seneca*, speaking of the silken Cloaths, owns they were used by the Ladies, and it seems they were thin like Gauz, for he complains that they discovered too much.

The Men were forbid to use silk Cloaths, by an Order of *Tiberius*. And even purple Cloaths were forbid by *Julius Caesar*,

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*Nepos Cornelius, qui divi Augusti principatu obit, me inquit juvene, violacea purpura vigebat, cuius libra denariis centum venibat: nec multo post rubra Tarentina. Huic succedit diaphala Tyria, qua in libras denariis mille emi non poterat.*

*Plin. lib. 9. cap. 39.*

*Summa medicaminum in L libras vellerum, Buccini ducuenta, Pela-

*Plin. lib. 9. cap. 38.*

*Pretium Indici. X. X in libras.*

*Plin. lib. 35. cap. 6.*

*Plin. lib. 8. cap. 48.*

*Plin. lib. 9. cap. 15.*

*k Seneca de Beneficiis lib. 7. cap. 9.*

*dio lib. 57.*
Tables of Ancient Coins,

for, "except to persons of certain ranks and ages, and on certain days."

"It seems they were extravagant in their Triclinaria, which one may translate Quilts or Carpets. Capito was reproached by Metellus, that he had paid for Babylonian Triclinaria 645 l. 6 s. 8 d. This is nothing to the price paid by Nero mentioned afterwards, viz. 3129 l. 13 s. 4 d. Ladies would pay for one piece of Linen 8072 l. 18 s. 4 d.

Their Extravagance in Cloaths appears from one particular, that they changed them often in their Banquets, and Baths.

In stating the balance of Expences between the ancient Romans, and our Dresses, the particulars must be consider'd: first Linen was not us'd among the Romans, at least by men, till about the time of Alexander Severus, of whom Lampridius, who wrote his Life, observes that he wore Linen. Varro lib. 1. takes notice that after the Romans began to wear two Tunicks or Coats, they introduc'd the words Subucula and Indusfurn. It is certain that Augustus wore a woollen Shirt. Suet. in Aug. cap. 82. Hieme quaternis cum pingui Toga, Tunicae & Subuculae thorace lasso & faminalibus & sibliabilis munibatur. Plin. lib. 19. cap. 1. relates it from Varro as a particular piece of Luxury of the family of the Serrani, that the Ladies wore Linen: so that in this Article the Balance of Expences is on our side. The Tunicks of the Romans, which properly answer to our Waistcoats, were simple, without Ornaments, and with very short Sleeves. Those who served at Table wore them larger plated, and tied with a girdle. Next to the Tunick they wore the Clavmys or Paludamentum, which was a sort of a short Cloak tied with a Buckle commonly to the right Shoulder: this was a garment of People of Quality, and commonly wore by the Emperors. The Pallium was a Garment somewhat like that of the Ecclesiastics in Popish Countries, but shorter. There were a great many sorts of them. The Palliolum was somewhat like our Riding-Hoods, and serv'd both for a Tunick and Cloak. The Phelone or

m Sueton. in Caesare. cap. 43.  n Plin. lib. 8. cap. 48.
Weights and Measures, &c.

Pomula did not differ much from the Cloaums, except in the Stuff it was made of. The Toga was a Robe of Quality, not allowed to the ordinary people: it came, as Tertullian (de pallio) observes, from the Pelasgi to the Lydians, and from the Lydians to the Romans. The Antiquaries being but indifferent Tailors, they wrangle prodigiously about the cutting out the Toga: I am of opinion a Mantua-maker could decide those Disputes better than the most learned of them. I mention those Habits, in order to observe, that because of the simplicity of the Shape, want of Ornaments, Buttons, Loops, Gold and Silver Lace, they must have been cheaper than ours, both as to the price of Materials and Taylor's Bills, and because loose Garments are likewise more lasting. One of the most valuable Trimmings of their Cloaths was a long Stripe sown upon the Garment, call'd latus Clavus. A latus Clavus of Gold was an extraordinary thing; for Popiscus in Bonafso, quotes a Letter of the Emperor Aurelian, which mentions amongst the Presents sent to Bonafus by the Emperor, Tunicam auro clavatam subsericam. Horace de Art. Poet.

Purpureus late qui splendesat unus & alter

Adsumitur panmus,

The Trabea or Vesti tribaeta, seems to have differ'd from some of the former in Shape as well as in the condition of the Stuff: according to it's appellation, in all probability it was only a striped Garment. The Lacerna came from being a military Habit to be a common Dress, especially in the Country: it had a Hood which could be separated or join'd to it, as occasion requir'd. The common People us'd this of a dark Colour, and the Nobles of Purple. The Birrus quas prisaos, was a Lacerna of a Flame Colour. The Gausape was a Habit rough and hairy on one side; and the Amphimalla was rough on both sides. The simplicity of their Ornaments appears from the Habits of the young Nobility, for the Pretena which was given to young Noblemen at the Age of sixteen, had
had only a purple border about it. It would seem that they did not make use of Handkerchiefs, but of the Lacinia or border of the Garment to wipe their face: for Plautus saith

At tu edipol, sume Laciniam & absterge
Sudorem tibi.

All these Garments were for the most part made of Wool at first. Silken Garments did not come in till late, and the use of them in Men was often restrained by Laws. Vopiscus tells us that the Emperor Aurelian denied his Wife a Silk Gown, and thought the demand very extravagant. And here I must advertize the Reader that tho' I have all along translated Serica Silken, it may not be the proper signification of that word: for good Criticks distinguish the Veslis Bombicina from Serica. And they are so distinguishing'd by Ulpian lib. 23. ff. de Auro Arg. Leg. Veslis an vestimenta legentur nihil refert, vestimentorum sunt omnia linea, lineaque, vel Serica vel Bombicina. The Bombicina were those which are made of the Silk-worm: and Serica perhaps made of a vegetable Production like Cotton. Ammianus Marcellinus lib. 23. cap. 11. Celi apud Seres jucunda temperies, salubrisque, Aeris facies munera, leniuque ventorum commodissimus fatus, & abunde silvae sublucide, a quibus Arborum fixus aquarum asperginibus crebris, velut quadam vellera molientes, ex lanugine & liquore mixtum subilitatem tenuissimam peculant. Virgilius lib. 1. Georg.

Vellera qua foliiis depectant tenuia Seres.

There are multitudes of other passages to the same purpose.

Men now-a-days are vastly more expensive in the Ornaments of the head, for the Roman Men went commonly bare-headed, except when the hot, cold or wet weather forced them to cover it with their Gown. In the Country they used sometimes a Hood. The Pileus, which we translate Bonnet, was somewhat like a Night-cap:
Weights and Measures, &c.

cap: it was the symbol of Liberty, and therefore given to Slaves at their Manumission. Suetonius tells us, that after the death of Nero, the people came all out with Pilei or Bonnets. There were other simple coverings for the Head, such as the Tutulus, Apex and Galerus: this last was made of the Skins of sacrificed Beasts. But all those Dresses for the Head were much cheaper than our Perriwigs and lac'd Hats. The Petasus was a sort of a travelling Cap: one may see the figure of it in the Statues of Mercury with wings added to it. Alexander the great wore it, as Athenaeus tells us.

As to Women's Dresses, I think the balance may be thus stated between the Roman and the English Ladies. Plantus in Epict. Art. 2. has made a comical List of a Roman Lady's Wardrobe, which is impossible to translate into any modern Language: but one could make an Inventory twice as long for an English or French Woman. The Roman and Grecian Women at first wore Toga, afterwards Tunicks: the Stuff was most commonly Wool, of so thin a Texture, for Summer Dresses, that Lucian says, you could see their Bodies through them. Tarentum was as famous for that sort of Manufacture, as now our Norwich is. The outward Garment of Women was the Palla or Amiculum, which sometimes covered the Head like a Veil; it was much the same with the Peplus. The Crotata was perhaps an outward Garment, so called from the Saffron Colour. The Penula mention'd before was us'd by Women as well as Men; it was forbid to Women, except in the Country, by Alexander Severus; perhaps for being too convenient for intriguing. In all these particulars, whether we consider the variety of Garments, price of the Stuff or Ornaments, our Ladies seem to be more expensive. I doubt the Roman Ladies were not so costly as ours in Head-dresses, although there be an infinite variety in ancient Busts and Statues. Faustina the wife of M. Aurelius appears on Medals in three or four different Head-dresses: for they were as changeable in their Fashions as we are. They us'd false Hair, or Perriwigs: such was the Caliendrum mention'd by Horace.
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The Abula, of which there are prodigious varieties still remaining, being a lasting thing, made of some Metal, even Gold ones, (which were allowed to Soldiers by Aurelian, as Fl. Popiscus informs us) must have been much less expensive than new Buttons and Loops to every Suit.

I have chosen to mention the most common Dresses, and the Stuff they were made of. As for the Vestes Byssina, which we are told some Ladies wore, they must have been of such an extravagant price, that there is no Stuff in our age comes up to it. The Scruple of Byssinum, according to Pliny (lib. r. 9. cap. r.) cost four Denarii, or 25. 7d. which makes the Pound Averdupois worth 491. 12s. consequently a Garment of twenty Pound Weight would cost 992 Pounds the Materials only, besides the Manufacture.

Both Men and Women wore Bracelets, Ear-rings and Pendants of Gold, and precious Stones. There are some found at this day of Amber, and Glass. They were very expensive in this Article, therefore Rubinus in Trimalcion's Feast saith, if he had a Daughter, he would cut off her Ears. Pliny lib. 12. speaking of Pearls and Emeralds, saith, for their Sakes, Excogitata sunt aurum pulvere, Wounds of the Ears were invented. Seneca de vita Beata, cap. r. 7. Ut mulier locupletis donus omnium Arribus generet. Idem de beneficis. Non satis est mulieribus insania, nisi hinc ac terma patrimonii Arribus pendens. By which passages, we find that Ladies, as well then as now, wore great Eates in their Ears. Both Men and Women wore Torques, Chains or Necklaces of Silver and Gold set with precious Stones. The Ancients seem to have been more expensive in Shoes and Stockings than we. There are about a dozen of names for the several sorts of Calcei, or the Coverings of the Feet and Ankles. The two extremities of the durableness of the Materials of Shoes, seem to have been in those of the Disciples of Pythagoras, made of the Bark of Trees; as Philostratus (in vitia Apolloni) informs us; and those of Empedocles, made of Brals. Strabo lib. 6. Philetus Cons was such a slender Fellow, that he was forc'd
Weights and Measures, &c.

for'd to wear Lead Shoes, for fear the Wind should blow him down: but Varro, who relates this Story from Aelian, asks a puz-
lung question, If he was so weak, how he could walk with such heavy Shoes. There were two sorts of Shoes among the Ancients, such as cover'd the whole Feet, viz. the Mulleus, Pero and Phæcaium; and those that left the upper part of the Foot bare, and were tied about with Thongs, viz. the Caliga, Solea, Crepida, Braxea and Sandalium. The Mulleus, (from whence perhaps the French word Mules) were at first allowed only to the Aediles, they were made of Leather dress'd with Album of a yellow Saffron Colour, and by them worn only on high Days. It is not quite certain when the Roman Senators began to wear Shoes, only we are sure Shoes were wore in the time of C. Marius, and Julius Caesar, who was blam'd for wearing high-heel'd yellow Shoes as being descended from the Alban Kings, as Dion tells us. Tho' Suetonius saith, it was only to increase his Stature. Afterwards the Romans grew extremely expensive and foppish in this Article: So that the Emperor Aurelian forbid Men that variety of Colours on their Shoes, allowing it still to Women. But the great Expence consisted in Pearls and precious Stones with which they adorn'd their Shoes. The use of Shoes was likewise restrain'd to certain qualities by the Emperor Heliogabalus. The common country People wore Perones, Shoes of undressed Leather. The Phæcaium was a white Shoe, used by Priests in sacrificing. Appian. Alexan. The Caliga was a military Shoe with a very thick Sole, tied above the instep with leather Thongs. The military Shoes of the Emperors and Tribunes were called Campagus. The Women wore Solea or Crepida, which left a great part of the upper part of the Foot bare. It appears from a passage of Cicero de Inventione, that wooden Shoes were given to Criminals to hinder them from making their Escape. As for what they call the Soccus, the dress of comical Actors, it was something between a Shoe and a Stocking. The Cosburnus was used in Tragedy: it had a high Sole, and so gave a greater Stature to the Stage Heroes. There was another sort of Orna-

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Tables of Ancient Coins,

ment wore by the young Nobility called Bullæ; they were round, or of the figure of a Heart, hung about their Necks like Diamond Crosses. Those Bullæ came afterwards to be hung to the Diplomas of the Emperors and Popes, from whence they had the name of Bulls.

The Men as well as the Women, in the later Ages of Rome, us'd Paint and Perfumes, and curled their Hair with great nicety. The Philosophers, Satyristts and Historians of those times are full of Reflections upon those effeminate customs.

It appears from some passages of ancient Authors, (Ammianus Marcellinus Lib. 28. Seneca de Tranquillitate Cap. 1.) that they kept their Cloaths, when they were not worn, constantly in a Press, to give them a Lustre.

Sic tua suppositis pertucert praela Lacernis.    
Martial.

They had great variety and changes of Garments. Plutarch relates a Story of Lucullus, that a Pretor coming to borrow of him some Dresses for his Chorus in a publick Spectacle which he intended to exhibit, Lucullus answer'd, that he would inquire if he had such, and meeting the Pretor next day, ask'd him how many he wanted, he told him a hundred, but Lucullus bid him take two hundred. See Horace to the same purpose.
Weights and Measures, &c. 149

CHAP. VII.

Of the Prices of Houses.

I have been able to discover very little of the common rates of House-rent; * There is a passage in Suetonius that seems to make that of the midling people at Rome, in the time of Julius Caesar, amount to 2000 Nummi, 16 l. 2s. 11 d. In the other parts of Italy to 500 Nummi, 4 l. 0s. 8¾ d.

Gratianus proves from a passage of Dio, that the latter sum was only a Quarter's Rent.

Sylla was reproached by his fellow Lodger, that he was once in so low a Condition, that whilst this fellow Lodger paid 250 Drachms, 8 l. 1 s. 5 ¼ d. for the uppermost Story, he paid for the rest of the House 750 Drachms, 24 l. 4 s. 4 ¼ d. The great people of Rome were magnificently lodged. Yet, it appears by a passage in Cicero's Oration for M. Calvis, that an annual Habitation or House-rent of 30000 Nummi, 24 l. 3 s. 9 d. was reckon'd pretty high.

The outside of Cicero's House was valued at vices H. S. 16 l. 4 s. 8 d. * His Country-house at Tusculum was sold for 725 Septertia, 585 l. 17 s. 3¼ both at under Rates.

Domitian reproaching Crassus for the extravagant magnificence of

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a Stetón in Cæsare. Annam metiam habitaciónem Romanus usque ad bina millia nummum; in Italia non ultra quingentos Septertia remitit.
d Cicer. Epist. ad Att. lib. 1. H. S. DCCXXV.
e Plin. lib. 17. Valer. Max. lib. 9. Cn. Domitius L. Crassio College suo, altercatione or-

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ed, object quod columnas Hyemetias in porti-

cu domus habeser: quem quem continuo Cra-

sus quanti domum sitam alimam, in-

terrogaret, atque ut respondit sexages Septertia; Quo ergo, inquit, minores fore estimas. Si de-

cem arbusculas inde succidero? Ipse tricies Se-

fertio, inquit Domitius. Tuque ait Crassus, uter

iiiori Lurospirn est? ego ne qui decem co-

lumnas centum millibus nummum emi, an tu

qui decem arbuscularum umbram tricies sef-

teria summa componam.
Tables of Ancient Coins,

of his House, offered him for it Sexages H. S. 48437l. 10s. 
Crassus asked him, if he shou'd cut down ten Trees, what he would 
give him in that case; Domitius replyed, he would abate him half 
the Sum: Which of us then, said Crassus, is most extravagant; |you 
that value the Shade of ten Trees at 2428l. 15s. or I a house 
left me by my Predecessors at twice as much? Pliny's number is here 
corrected by Valerius Maximus.

It appears by a passage of Plutarch in the life of Marius, that the 
value of Houses in Rome rose considerably in a few Years: For 
Marius's House, that was bought by Cornelia for 874 Myriads of 
Drachms, 2421l. 17s. 6d. was in no long time afterwards purchased 
by L. Lucullus for 50 Myriads, 200 Drachms, 1615l. 5s. 10d.

Pliny seems to intimate the extraordinary Magnificence and In 
crease of the value of Houses; by telling you that the House of 
Lepidus, which in the time of his Consulate was reckoned one 
of the finest in Rome, within the Space of 35 Years was not in 
the hundredth Rank. Hirrus's Country-house which was but 
small, by reason of the Fish-ponds, was sold for 3291l. 
3s. 4d.

Clodius's House cost centes & quadrages cisties, 119479l. 
3s. 4d.

Considering the Magnificence of their Houses, I should be 
apt to think that both the Materials and Workmanship were cheap.

M. Lepidus's House was the first that had a Marble Door-case.

Afterwards they had gilded ones, or rather plated with Gold:

Then they began to case their Houses with Marble: I think it 
was Marmor, Caesar's Master-Carpenter in Gaul, that built the first 
of this kind. Afterwards they gilded their very Walls. 

Senecam Rhetorem. Primum Roma parietes 
cruita Marmoris operuiffe totius domus for in 
Cellio Monte Cornelius Nepos tradidit Ma 
murram Formas natum, Equitem Romanum, 
Prefectum fabrüm C. Caesaris in Gallia Plin. 
lib. 36. cap. 6. 10 Plin. lib. 33. cap. 3 Hierony 
mas in Epist. ad Gaudent. Petronius, sedine 
nero. 1 Paries Tyris & Hisacinthii & 
ilis regis velis, que vos operose refertetransf 
figureis, pro pictur sit. Habilum 
De Habitu Mulicrum.
Weights and Measures, &c.

their Houses were costly Hangings, of Tyrian Dye. 10 Marble Pillars with gilded Capitals. 75 The Villa Gordiana had a Portico of 200 Pillars. 75 They had Fountains of variegated Marble in their Rooms. 75 Their Houses stood upon as much Ground as their Ancestors were allowed for Estates, viz. four Jugera, or 2 English Acres. 75 There were private Houses like Cities. 75 They had Orchards and Woods on the Tops of their Houses, besides that they were of an immoderate height, 75 which was confined afterwards by Augustus to 70 Roman Feet, and 75 by Trajan to 60.

It appears from some fragments of a Plan of Rome, made in the time of Septimius Severus, that there were a great many Insula or Islands, which consisted not always of one great Palace, but likewise of Houses of Artificers joined to it. The Magnificence of Rome was extremely increased in Augustus's Reign, who, as it is commonly said, Lavatam inventa, Marmoream reliquit, that he found it Brick, and left it Marble. We know little of the form either of the outside or the inside of these palaces; we have the names of several parts of them, as the Vestibulum, Atrium, Triclinium, Ceratones, Cenaecula; and we can judge from passages of Authors, such as those above-mentioned, that they were very magnificent. What the Romans called Vestibulum, was no part of the House, but the Court or Landing-place between it and the Street; which Gallus apud Aureum Gallum explains thus, Vestibulum esse dicit non in ipsis aedibus, neque partem aedii; sed locum ante jamnam domus vacuum per quem a via aedibus accessuque ad alas est. Cum dextra mense masse janae testa sunt, et ipsa jamna procul via est, arca vacante interfecta. Suetonius tells us, that the Colossus, a Statue of Nero, 120 Feet high, stood in the Vestibulum, which was so large that it had three Portico's, each a Mile in length. Tanta laxitas ut Porticus

1 Hieronymus ad Gaudent. 2 Capitolinus in Gordiano. 3 Statius in Tyburtino An picturat lucentia marmora venet Miter, et emissa per cuncta cabilia lympha. 4 Valerius lib. 4. cap. 4. Et quoniam inter arans non solum dignitas patris-familias confisset, fed etiam Diutinatis delata est. — Anguile de-habitasse nunc putat, cujus domus tantum patet, quantum Cincinnati rura patuerunt. 5 Salvianus in Ecclesia Cathol. Edificia privata laxitatem Urbium magnarum vincentiam. 6 Seneca Epist. 122. Non vivent contra naturam? Qui pomaria in fummis torribus ferunt, quorum foveae in tegulis Domorum ac faltigias nutant. 7 Strabo lib. 5. 8 Aurelius Victor in Epitome.
Tables of Ancient Coins,

...ticus triplices milliares habet. These three Courts it seems were called the Vestibulum. The Atrium was a part of the Building, and distant from the Vestibulum. *Virgil. Æneid. 1.*

*Crateras magnos statum & vina coronant.*
*Ft sprecitus telis, vocemque per ampla volutant Atria.*

*Servius* on this passage tells us that *Virgil* alludes to the Custom of the ancient Romans, who of old, as *Cato* informs us, *in Atriis duobus fermentis epulabantur,* supped in the Porch on two Dishes.

Their eating Rooms were called *Cenationes, Cenacula, Triclinia.* In a passage of the Description of *Pliny's Country-house* there are mention'd *duo dieta,* two little eating Rooms, which are distinguished from the *Cenatio,* a great supper Room, or as we call it dining Room. Authors place the *Cenaculum* at the top of the House, it was the Term for the eating Room of the lower sort of people. Every body knows that the *Triclinium* was so called from the Figure and Beds on which the Guests lay in a recumbent posture. It is used most frequently for the Table and Beds, sometimes for the *Cenatio* or Room itself. Their Bed-chambers were called *Cubicula.* It is thought they had no Chimneys, but were warm'd with Coals on Brasiers. It has been a great question among the Antiquaries, whether the Ancients had Chimneys; a negative Argument is, that Vitruvius has left us no Description of the manner of their Construction. It is certain the poorer sort let the Smoak go out at the Window. *Cato* speaks of anointing the wood with a certain *Amurca,* Foam of Oyl, which kept it from smoking, which seems to me impossible. That they made Fires of wood it's certain. *Horat. 1. Car. 9.*

*Dissolve frigus, ligna super foco*
*Large reponens* ———

Therefore
Weights and Measures, &c.

Therefore it would seem they had some passage for the Smoke. *Ulysses* in Calypso's Cave longed to see the Smoke of the Houses of Ithaca. *Suetonius* tells us, that when *Vitellius* was inaugurated, the Chimney first took fire, and then the Dining-room. *Cum ignis statim Caminum incendisset, Triclinium deinde absumpsit.* And the word in modern Languages signifying Chimney, comes from *Camimus*. That which made Chimneys so rare amongst the ancient Romans, was their manner of warming their Houses, as *Seneca* tells us *Epist. 90*. *Per impressos parietibus tubos per quos circum funderetur calor, qui simul & summam ferret* *aequaliter*, by Pipes buryed in the Walls, which from one great Fire warm'd all the Rooms equally.

There are likewise disputes about the Windows of the Ancients; that they had Windows is certain. The Light was let in by a transparent Stone called *Speculum*. *Seneca* speaks of it as an invention of his time. This Stone was us'd by the younger *Pliny* in his Country-House. Those Stones were dug in Segobriga in Spain, as *Pliny* tells us *lib. 22. cap. 33*. And afterwards in Cyprus, Cappadocia, Africa and Sicily. *Nero* within his golden Palace built a Temple of this Stone, which receiv'd Light enough in the day-time without any Windows. This Stone might be a sort of *Alabaste*, but more transparent than ours, which does not grow pellucid till it is cut very thin. The most common Materials of ancient Windows, was thin Canvas or Cloth. *Montfaucon* speaks of a Book that was going to be publish'd by one Bonarota a Florentine Senator, which proves that the Ancients had Glass Windows. I have not seen that Treatise, and consequently cannot judge of his Reasons. I am of M. Perrault's Opinion, that the polite Augustus had neither a Shirt to his Back, nor Glass to his Windows.

The Furniture of their Houses must have been costly. *Martial. Epigr. in Quintum* tells us that *Quintus's* Furniture, which was but in a narrow Compass, cost him above *8072 l*.

*Constat decies tibi non spatiosa Supplex.*

They
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They were nice and costly in their Chairs and Lamps. Their Lecti Cubicularia, or their Beds for sleeping, so called to distinguish them from their Tricliniares or Dining beds, came at last so to be very costly, with Feet of Ivory, Silver, Gold, and precious Stones. And their Mattresses were made of Feathers, Straw and other Herbs; sometimes of Purrs, which came from Gaul: they were rais’d so high, as to be mounted on by Steps, as Pliny tells us, lib. 20. There is no mention made of their having Curtains.

It is somewhat foreign to my present purpose to enter into the Expences of the publick Buildings; the Reader may see at the bottom of the Page a Description of M. Scenurus’s Theatre by Pliny. I am not Architect enough to give the Reader a right Idea of it; only so far we may gather from the description, that there was a triple Scene in height one above another, consisting of 350 Pillars, the lowest of Marble, the middle of Glass, (by an unheard-of piece of Luxury, as the Author expressed it) and the upper of Tabule inaurata, which I cannot tell how to translate; the lateral Sense is gilded Tables or Pictures; for Hardwicke’s Pliny hath in this place a different reading from the others. The lowest Row of Pillars were 42 Feet high, and there were 3000 brown Statues between the Pillars: the Theatre held 80000 Men. It was the same M. Scenurus who having carried some of his superfluous Furniture and Stores to his Country-House at Tusculum, which by the malice of his Slaves was burnt, lost in that one Article Millies H. S. br 807291. 13 s. 4d.

Pliny prefers this Theatre to Nero’s golden House, which must have cost an immense Sum, since "Ostho laid out in finishing some part of it quingenties H. S. 403445 l. 8 s. 8d."

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1 Scena et triplic in eis erat circinum 300 columnarum, in ea civitate, que sex Hymettia non toleravit, sine profido cive ampliam. Intimam Scenae marmore fuit: media e vitro, inaudita etiam potens genere Luxuriae: summa e tabulis inauratis. Columnae, ut dirimus, inaudita quadragenum pedem. Signa erat inter coltimnas, ut indicavimus, fuerunt tria millia numero.

2 Saeve ipse cepit hominum LXXX millia cum Pompeiani Theatri toties multiplicata urbe; tantocque majore populari, suffocavit haeve quam quingentae milliae. Sed & reliquas apparatas, tantum Barbera veste, tabulis pictis, catalogo doctissimo fuit, ut in Tusculanum villam reportarit que superficilem quotidiani usu deliciis, incensa villa ab histis Veris, conspectuque ad 11000 milliae. Plin. 36. cap. 15. 3 Nec quicquam prae praepetere subfruebunt, quam quingenties fessertium ad peragendum aures domum.
Chapter VIII.

Of the Price of Land.

I have endeavoured, by comparing passages of Authors together, to get some light into the price of Lands, and the yearly rent of them. No doubt there were lands of different values, according to their different goodness and situation: yet there are some things mentioned of middle prices, which will shew us in what proportion the value of their Lands stood in regard to those of our own Country.

* Columella says, that a Vine-dresser who could look after 7 Jugaera, was commonly sold for 8000 H. S. 64 l. 11 s. 8 d. A sum which he saith was sufficient to buy 7 Jugaera of indifferent Land, consequently the Juggurum of such Land was worth 9 l. 4 s. 6 d.

The Roman Juggurum was to the English Acre near as 10 to 15; at this rate the English Acre of such Land was worth 14 l. 15 s. 3 d.

* Pliny mentions the purchase of a Vineyard in the Nomentan Land, which at a cheap rate came to 60000 H. S. 48 43 l. 15 s.

Budaus reckons it was a Centuria. The *Centuria* consisted at first of 100 jugera; afterwards, by a continuation of the same word,

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* Vitruvius, in Publicola.
* Plutarch, in Dei Fugce.  
  a Vide Plinius lib. 34. cap. 4. & Budaus de Aste lib. 4.  
  c Centuriam mane-ecdiana (at Varro it) decen-  
  * jugerum spectum; olim autem ab centum  
  jugeribus vocabatur centuria, sed mox duplicata
Tables of Ancient Coins,

word, and an impropriety of Speech, it came to be reckon'd 200 Jugera: tho' according to Cato, a Centuria of a Vineyard consisted still of 100 Jugera. At this rate, a Jugerum of this Vineyard came to 48 l. 8 s. 9 d. And an English Acre to 77 l. 19 s.

There is another passage in Columella, which makes the common or middle yearly Rent of a Jugerum of Pasture, Meadow or Copse Land 16 s. 1 d. in Italy. At this Rate the Rent of an Acre comes to 1 l. 5 s. 10 d.

Land was reckon'd commonly at 25 Years Purchase, for the Lands of the Government were so let, paying according to the Rate of 4 per Cent.

A Purchase of 500000 Nummi paid 20000 Nummi a Year: at this rate, according to the foremention'd Rent, the Purchase of an English Acre of such Land, was worth 32 l. 5 s. 10 d.

There is a passage in Varro, which gives further light in this matter. He introduces Merula affirming that his Villa brought him yearly by fat Birds 60000 Nummi, 48 l. 7 s. 6 d. which is twice as much (faith he) as the Rent of your two hundred Jugera at Rate; consequently 200 Jugera brought Axius, (that was the Proprieter's name) the half of that Sum, viz. 24 l. 3 s. 9 d.

Then the yearly Rent of a Jugerum was 1 l. 4 s. 2 d.

At this rate, the Rent of an English Acre comes to 1 l. 18 s. 8 d. which reckon'd at 25 Years purchase would make it worth per Acre 48 l. 6 s. 8 d.

Tully mentions in his Epistles to Atticus a very cheap Purchase, as an instance of the badness of the times, it comes per Acre only to 1 l. 9 s. 8 d.

The price of Land was considerably increased by the great Treasure that was brought to Rome in Augustus's Reign.

As

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Weights and Measures, &c.

As to the value of Ground in the City, there is a remarkable passage in Suetonius, he tells you that the Ground upon which Caesar built his Forum, cost Millies H. S. 807291 l. 13s. 4d.

I cannot well say what were the Dimensions of this Forum, but it must have been less than the Circus built by Caesar, of which Pliny hath given the dimensions, viz. 3 Stadia in length, and one in breadth, and after this he adds that the whole with Buildings round, stood only on four Jugera, which must be a false reading, and I wonder that Authors have not observed it; for instead of Jugera quaternum, it ought to be quadraginta. There are in a Roman Stadium 625 Roman Feet, consequently 3 times that number, multiplied in itself, makes an oblong of 1171875 square Roman Feet, this divided by 28800 makes above 40 Roman Jugera. It's true the Circus itself or the Ellipsis inscribed within that oblong would not perhaps be above 32 Jugera, but since he reckons in the buildings about, which it's likely took up the whole Space, the computation at 40 Jugera is pretty exact. Now reckoning the Forum of the same bigness, altho' it could not be near so much; and that it stood upon 40 Roman Jugera, that is, 25 English Acres of Ground, it would make it per Acre, about 3229 l. and the yearly Rent per Acre, at 25 Years purchase, or 4 per Cent. would be near 1292 l. 1292 Feet in Front, and about 33; deep makes an Acre; at this rate an Acre of this Forum would bring in Ground-rent 20 Shillings a foot. But the Forum was not so spacious, for the Antiquaries for some reason or another make it the least of all the Fora. And indeed, comparing it with the draught of Nerva's Forum, it could not take up 2 Acres: but allowing it 5; at this rate a Foot in Front, and 33; deep, would be five times as dear, that is, would bring in a Ground-rent of 5 Pound.

\footnote{1 Sueton. in Cesar. Forum de manubiiis inchoavit: cujus area super H. S. millies constitit. \footnote{2 Nam ut Circum maximum a Cesar Dictatore exstrudum, longitudine stadiorum tri-}

um, latitudine unius, sed cum aedificis jugerum quaternum (quadraginta) ad sedem CCLX millia hominum inter magna opera dicamus.

C H A P.
Tables of Ancient Coins.

CHAP. IX.

The Price current of Drugs, as they stood at Rome, most of them in Pliny's Time per Roman Pound, which is \( \frac{1}{4} \) of the English Averdupois.

Andracb per Pound, 5 Asses, 3d.

Simopis, a sort of Rubrick or Rudle, 8 Asses, 6d.

Ditto the better sort, 30 Asses, 1s. 11d.

Armenian purple 30 H.S. 4s. 10d.

Indian Purple from one Denarius, or 7½d. to 30 Denarii, 19s. 4½d.

Pelagium, the Juice of one sort of Fishes that dyed Purple, 50 H.S. 8s. 0½d.

Buccinum the Juice of the other Fish that dyed purple, 100 H.S. 16s. 1½d.

Harduin reads these two passages not of the Pound, but the 100 Pounds. For the Sense of Pliny in that place is, that it was surprizing that the purple Dye should be so dear, when the Drug that it was made of was so cheap.

Pliny says, that to dye 50 Pounds of Wool, was required 200 Pounds of Buccinum, and 110 of the Pelagium: that proportion of Mixture making the true Dye. According to the first reading, by the Pound Weight, it would make the dying of a Pound come to 4l. 2s. 4½d. which in the Chapter about Cloaths was reckoned by the English Pound. There is some Mistake in the numbers of

a Plin. lib. 35. cap. 6. Asses quini in libras. \( \text{fis denariis ad triginta.} \)

b Ibid. Asses octoni in libras. \( \text{f} \) ibid. Triginta quaginta nummi.

c Ibid. Tenenti nummi.

da nummi in libras. \( \text{i} \) bid. cap. 5. As singu-

* Lib. 9. cap. 40. quinquaginta.
Weights and Measures, &c.

of Pliny in this Place. And instead of L, which Harduin puts in at a venture, it would be more consistent if you put in 8, which you see would reduce it to half price: for Pliny makes the price of the Violet-purple 3 d. 4 s. 7 d. which I believe is to be explained of the Pound of Wool dyed.

1. Cinnabar 30 H.S. 8 s. 0 2d.

2. Tarentine red purple, price not mentioned.

3. The Tyrian double Dye, 1000 Denarii, 32 l. 5 s. 10 d.

4. Melium, a sort of Colour that came from Melos, one Nummus, 1 ½ d.

5. Parotonium, a sort of Colour that came from Egypt, very lasting, 6 Denarii, 3 s. 10 ½ d.

6. Ladanum a Gummi, 40 Asses, 2 s. 7 d.

7. Opopanax, 2 Denarii, 1 s. 3 4d.

8. Gum Ammoniac, 40 Asses, 2 s. 7 d.

9. Galbanum, 3 Denarii, 3 s. 2 4d.

10. True Beddium, 3 Denarii, 1 s. 11 ½ d.

11. Myrrh Sinuva from 10 Denarii, 6 s. 5 4d. to 11 Denarii 8 s. 1 4d.

12. Ditto Berytanean from 11 Denarii, 8 s. 1 ½ d. to 16 Denarii, 10 s. 4 d.

13. Ditto Tryglodyck (nucleus, id est) granulated, 16 Denarii 10 s. 4 ½ d.

14. Ditto sweet-scented, 14 Denarii, 9 s. 0 ½ d.

15. Frankincense, worst sort, 3 Denarii, 1 s. 11 ½ d.

16. Ditto, second sort, 5 Denarii, 3 s. 2 ½ d.

17. Ditto, best sort, 6 Denarii, 3 s. 10 ½ d.

18. Stromex, 19 Denarii, 12 s. 3 ½ d.

19. Chios, white Mastick, 20 Denarii, 12 s. 11 d.

20. Black...
Tables of Ancient Coins,

1. *Black Pepper, 4 Denarii, 2 s. 7 d.*
2. *White Pepper, 7 Denarii, 4 s. 6d.*
3. *Long Pepper, 1 Denarii, 5 s. 8d.*
4. *Cardamomum, 12 Denarii, 7 s. 9d.*
5. *Amomum whole, 60 Denarii, 1 l. 18 s. 9d.*
6. *Ditto, ground or bruised, 58 Denarii, 1 l. 17 s. 5d.*
7. *Myrobalanum, 2 Denarii, 1 s. 3d.*
8. *Ginger, 6 Denarii, 3 s. 10d.*
10. *Ditto, the best, 15 Denarii, 9 s. 8d.*
11. *Coffus, 16 Denarii, 10 s. 4d.*
12. *Indian Spikenard, small leaf, 75 Denarii, 2 l. 8 s. 5d.*
13. *Ditto, middle leaf, 60 Denarii, 1 l. 18 s. 9d.*
14. *Ditto, large leaf, 50 Denarii, 1 l. 12 s. 3d.*
15. *Ditto, the Spike, 90 Denarii, 2 l. 18 s. 1d.*
16. *Ditto, French, 3 Denarii, 1 s. 11d.*
17. *Xylocinamomum, 20 Denarii, 12 s. 11d.*

The Juice of Cinnamon, that is the expressed Oyl, sometimes sold for 1000 Denarii, 32 s. 5 s. 10d.

18. *Isocinamom, a sort of Cassia, reckon'd equal in value to Cinnamom, 300 Denarii 8 l. 13 s. 9d.*

*Malabathrum had risen from one Denarius to 300, that is to 8 l. 13 s. 9d.*

The Oyl of it only 60 Denarii, 1 l. 18 s. 9d.

Cinnamomum Camacum, the expressed Juice of a Nut, which they mixed with precious ointments, quite different from what *Pliny calls the Sucus Cinnamomi, 40 Asses, 2 s. 7d.*

19. *Sericatum, another Oyl that they mixed in their Ointments 6 Denarii, 3 s. 19d.*

20. *Oleum*

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*Footnotes:

1. Ibid. 7 IV Denarii. VII Denarii, XV Denarii.
2. Ibid. cap. 13. XLVII Denarii. c Ibid. cap. 13.
3. Uvae Amomi LX Denarii, frusti LVIII. d Ibid. cap. 21. II Denarii. e Ibid. cap. 7. VI Denarii.
5. Ibid. cap. Xylocinamommi pretium in libras Denarii XX. i Ibid. cap. 19.
Weights and Measures, &c.

Oleum Cyprium, made of an Ægyptian Tree, 3 Denarii, 3 s. 2 d.
Asparathos, a root used for precious Ointments, 5 Denarii, 3 s. 2 d.
Opobalsamum, 300 Denarii the Sextarius, per English Pint 8 l. 2 s. 1 6 d. This was the price as it was sold by the Publick: but as it was adulterated, it brought the owners per Pint 27 l. 0 s. 4 4 4 d.

There was likewise a Xylobalssamum, which was an Oyl made of the boiling of the Sarmenta of the Tree, that was sold for 6 Denarii, 3 s. 10 d.
The Oyl of the Sesama, an Indian grain and used for Sauce, per Pint 5 s. 6 d.
Garum, a Sauce made of Fish, much used by the Romans, per Pint, 11 s. 5 4 d.

CHAP. X.

Of the Price of Slaves.

Another way of determining the quantity of their Riches is, by finding out the price of Labour, and the value of certain pieces of Workmanship. In order to come at that, we must begin with the prices of their Slaves.
The price of an ordinary Slave in Cato major's time was 375 Drachms, 48 l. 8 s. 9 d.

It was a principle with him not to entertain any that was delicate, but strong Fellows fit for country Labour.
Tables of Ancient Coins.

* The price of a Vine-dresser was 8000 Sesterii, 64l. 11s. 8d. Those were common prices; but such as exercised more polite Arts, and were entertained for Fancy and Luxury, were much dearer.

The Anagnostes Slaves, or such as could read, were dear. One Calvisius Labinus, who thought he could purchase the Character of a learned Person by having a learned Equipage, bragg’d that he had several such Anagnostes Slaves, none under 100000 Nummi, 807l. 5s. 10d.

Julius Cæsar, who was really skilled in polite arts without Affectation, bought several such Slaves at very great prices.

Pliny reckons the highest price that ever was paid for a man born in Slavery, was for Daphnis the Grammarians. There are several different readings of this passage, but Harduin reads it Sesteriis septingentis, which makes the price at 565l. 0s. 10d. Yet afterwards he mentions a much higher price, *viz.* that for which Nero manumitted the Dispenfator of Tividates. (Dispenfator according to the way of speaking of that time was properly a Cashkeeper or Privy-purse.) In Harduin’s Pliny it amounts to Centies trices H. S. 104947l. 18s. 4d.

But Pliny adds this was not as a bargain of civil Commerce, but the price of a Prisoner of war.

Among Slaves who exercised polite arts, none sold so dear as Stage-players or Actors, which *Pliny* faith was not to be wondered at, since they gained so much to their Masters. Roscius particularly could gain yearly 500 Sesteria, 4036l. 9s. 2d. *and per diem* when he acted 4000 Nummi, 32l. 5s. 10d.

The numbers in Cicero’s Oration for Roscius are uncorrect.

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Weights and Measures, &c.

Calliodorus mentioned by Martial sold his Slave for a Supper very cheap, 10l. 10s. 8d.

A Morio, or Fool, was sold for 16l. 9s. 2d.

The price of Slaves was regulated afterwards by Justinian at much lower Rates. The lowest at 10 Solids, and the highest at 80. The Solids were the Aurei of that time, and 100 Solids made dena, or 10 Sesterces, viz. 80l. 14s. 7d.

But according to the weight of them, and the value of Gold at this time, they would be worth 87l. 8s. 6d.

We shall chuse the ancient proportion; so that it may be said according to Justinian's regulation, the lowest price of a Slave was 10 Solids, 8l. 1s. 5d. And the highest, 80 Solids, 64l. 11s. 8d.

For Example, the price of a Slave, Man or Woman, under ten years old, was 8l. 1s. 5d.

The price of one above ten years old, was double that, viz. 16l. 2s. 11d.

The price of Slaves of both Sexes that had Trades, was 30 Solids, 24l. 4s. 4d.

That of Eunuchs under ten Years old was the same, viz. 24l. 4s. 4d.

The price of Servi Notarii, and Eunuchs above ten years old, was 50 Solids, 40l. 7s. 3d.

The price of an Eunuch, if a Tradesman, was 70 Solids, 56l. 10s. 2d.

The Expences of the ancient Romans in Slaves must have been very great, for they had Trains of them as big as Armies, 10 or 20000 Slaves, not for Gain but Show.

1 Addit. servum numinis hære mille trecentis, ut bene cenares Callidore semel. Mart. lib. 10. Epigr.
3 Justinianus in lege sedecim. Minimum autem pretium non infra viginti solidos, max

Y 2

CHAP.
CHAP. XI.

Of the Prices of Pictures, Statues, and other Pieces of Workmanship, of Arts, Professions, &c.

T HE Romans at first were very ignorant of the value of Pictures; and even as low down as A. U. 565. *L. Mummius* surnamed *Achaicus*, seems to have been no great Virtuoso in this way. For when King *Attalus* offered to redeem the Picture of *Bacchus*, painted by *Arístides*, for what Pliny calls *sexies Sestertium*, or 4843 l. 15 s. *L. Mummius* imagining there was some wonderful vertue in the Picture, stopt it, to the great discontent of that King. Pliny in another place speaking of a Picture of Arístides, faith it was bought or redeemed by King *Attalus* for 100 Talents, 19375 l. Whether it were the same Picture or not, with a mistake of the price in one place, I will not determine.

Afterwards the Romans came to be better acquainted with the value of Pictures. *The Medea* and *Ajax* of *Timomachus* were bought by *Julius Caesar* for 80 Talents, 15500 l.

*Hortensius* paid for *Odyia's Argonauts* H. S. CXLIV. 1162 l. 10 s.

*Agrippa* purchased two pieces of *Ajax* and *Venus* from the *Cyzicenians* for a small price, viz. 12000 *Nummi*, 96 l. 17 s. 6 d.

*Nam cum in praeda Rex *Attalus* VI millia Sestertium emisisset *Arístidis Tabulam* Liberum Patrem continentem, pretium miratus, suipicatusque aliquid in ea virtutis, quod ipse nefciaret, revocabit Tabulam, Attalo mulium querente. *Ajaxis & Veneris mercatus* est a *Cyzicenis* H. S. XII. M. *
Weights and Measures, &c.

And yet every body wondered that a man of his rough Temper would give so much.

The Venus Anadyomene (that is, issuing out of the Sea) was valued at a hundred Talents (for so much Tribute was remitted for it) 19375 l.

The Archi-Gallus or High-Priest Parrhasius, which Tiberius was so fond of, was valued at 60 Sestertia, 484 l. 7 s. 6 d.

L. Lucullus bought the Copy of Glycera, Pamphilus's Maid, the Original being painted by Pamphilus himself, for two Talents, 397 l. 10 s.

And to mention some prices given by the Greeks; the 12 Gods of Aesopiodorus were purchased by Mnason the Tyrant for 30 Minae, or 96 l. 17 s. 6 d. a-piece, the whole dozen amounting to 1162 l. 10 s.

This was no great price for a Piece of a Painter, whom Apelles himself admired for the Correçness of his drawing.

The same Mnason paid more for his Heroes than his Gods, he gave to Theomnestus the Painter for each of them 100 Minae, 322 l. 18 s. 4 d. The dozen of Heroes came to 3875 l.

Aristides was employed to draw Alexander's Battle with the Persians, in which there were a hundred figures, and bargain for no more than 10 Minae a figure, which amounted in all to 3229 l. 3 s. 4 d.

Aristides was reckon'd the first man for Expression, but hard in his Colouring.

Apelles was paid for his Alexander holding the Thunder (which was put up in the Temple of Diana at Ephesus) in weight, not in tale,
Tables of Ancient Coins,

20 Talents of Gold, \textit{viz.} according to the decuple proportion 38750\textpounds. It would come to more if reckoned according to our proportion betwixt Gold and Silver. But Harduin reads Talents of Silver only.

I have mention'd some of the foregoing prices of Pictures, to shew the manner of Painters bargaining by the number of figures. \textit{Nicias the Painter refused for Necromantia Homerii, 60 Talents, 11625\textpounds.}

The Romans seem to have been better furnished with Statues and carved work, than fine Pictures. There are multitudes of such pieces recorded by Pliny, with the prices of very few of them. But we may easily conjecture they must have been pretty high; for a people so rich and so luxurious, would not balk their fancy in such things. The most of their Statues were either brought from abroad, or made by Greek Artificers. Such of them as by the quantity or fineness of the Mettal were of immoderate prices, are not proper instances of the value of fine Workmanship, yet we shall mention some of them, because they are examples of Magnificence.

In the time of the Consulate of Mutianus, there were reckon'd at Rhodes 300 famous Statues, and as many at Athens. The Colossus of the Sun at Rhodes, which Charis Lindius made, was 70 Cubits high, which, reckoning according to the Greek Measure, is 105 \frac{1}{2} English Feet, and was made in twelve Years for 300 Talents, that is, 58125\textpounds.

There were a hundred other lesser Coloss in the same City.

There was a Colossian Statue at Tarentum made by Lysippus, who was Charis's master, of 40 Cubits high, or about 60 \frac{1}{2} Feet.

The Statue of Apollo in the Capitol, brought from Pontus by Lucullus, was 45, Feet high, it cost 150 Talents, 29062\textpounds. 105.

\textit{The}

\textit{Plin. lib. 33. cap. 7 & 8.}

\textit{Plin. ibid.}

\textit{Plin. ibid. Solus Colosius Rhodi quam fecerat Charis Lyndius, Lysippii discipulus, feptuagiuta Cubitorum altitudinis fuit: duodecim annis tradunt effectum CCC Talentiis.}

\textit{Plin. ibid. sunt alii minores in eadem urbe Colosii centum.}

\textit{Plin. ibid. Talis et Tarenti factus a Lysippo XL cubitorum.}

\textit{Plin. ibid. XXX cubitorum C L talentis factus.}
Weights and Measures, &c.

The Mercury of Zenodorus, set up in the City of Arvergne, which Pliny faith exceeded all Statues in bigness in his time, and was ten years in making, cost the Workmanship only 400 Sesteria, 3229 l. 3 s. 4 d.

There was collected for a Statue of an ordinary Size, 1259 l. 3 s. 4 d. which Cicero reckons too high a price, as appears by a passage of his contra Verrem. There are very low prices of other Statues mentioned in the same Orations.

As, some Statues of Praxiteles, Myro and Polycleites, for 52 l. 9 s. 2 2/3 d.

The Cupid of Praxiteles was purchased for 12 l. 18 s.

There are some pieces of workmanship mentioned in Cicero's action against Verres, but the prices charged by him were so extravagant, and what he paid was so little, that there is nothing to be inferred from them.

For example, he was accused by Cicero for charging for a piece of Work 560000 H.S. 4520 l. 16 s. 8 d. which could have been done as well for 80000 H.S. 645 l. 16 s. 8 d.

In this passage he affirms that three as large Pillars, as that which he set up, might have been placed with long carriage paid, for 40000 H.S. 322 l. 18 s. 4 d. which is a pretty high price, being above 100 l. a Pillar.

Craesus paid for his 10 Pillars, 100000 H.S. 807 l. 5 s. 10 d.

By such methods it was no wonder that Verres grew rich, having plundered and extorted to the value of 40000000 H.S. 32916 l. 13 s. 4 d.

And his Secretary, by his Master's connivance, to the value of 1300000 H.S. 10494 l. 15 s. 10 d.

a To privatis longæ difficiltisque vesturae columnae singulas ad impluvium LL-S. quadragenis millibus locata sunt.  

b Val. Max. lib. 9. Decem columnas centrum millibus numnum.  
c Cicer. in Verr. H.S. quadrimgentes contra leges adefuit.  
d H.S. trdeccies Verris scriba permisit Domini ex pecunia publica adefuit. Cicer. in frumentaria Verr.
Tables of Ancient Coins.

To return to the value of Statues. Lucullus bought the Proto-
plasma or Model of Venus genetrix, for 60 Sestertia, 48 l. 7 s. 6 d.
This was made by Artesiaus, who was in so great a repute, that
a Model of Paste, of a Cup that he was making for one Octavius
a Roman Knight, was purchased for a Talent, 193 l. 1 s.

This naturally leads me to say something of the price of the
Workmanship of their Plate. C. Gracchus bought silver Dolphins
at 5000 H.S. 40 l. 7 s. 3 3/4 d. the Pound.

Craffus bought two silver Boats graved by Mentor, for 100
Sestertia, 807 l. 5 s. 10 d. He owned that he was ashamed to use
them, they were too fine. And that he had several silver Vessels,
bought per Pound Roman at 6000 H.S. 48 l. 8 s. 9 d.

There was paid for two glass Cups, the same Sum.

Reckoning according to the Standard of our Coin, and the
English Pound, the mere Workmanship of the Plate mention'd in
the last Article, comes per Pound to 48 l. 19 s. 1 d.

The Romans were very costly in their Murrhina and Trulla (their
drinking Cups) one that held 3 1/3 Pints, cost 80 Sestertia, 645 l.
16 s. 8 d.

A Lady not very rich, paid for one 15000 Nummi, 1210 l.
18 s. 9 d.

Manuscript Books are another sort of Manufacture, of which
there must have been most undoubtedly some stated prices, for
such as were commonly current. The Prices which I find men-
tioned by the Ancients are for such as were Manuscripts in our
Sense, that is, not published, and valuable for the rarity of them.

Pliny faith that his Uncle told him he could have sold his Com-
mentaries,

9 Plin. lib. 35. cap. 12.  x Plin. lib. 35.
esp. 12. Octavio Equiti Romano Cratera facere
volenti, Exemplar a Grypho factum talento.

‡ Plin. lib. 33. 11. Delphines H.S. quinis mil-
libus in libras emptos C. Gracchus habuit. L.
vero Craffus Orator duos styphos Mentoris
Artificis manu calatos fessertiis centum. Con-
fessius tamen eis nuncquam fe iis uti propter ve-
recundiam suum. Eundem sex millibus fe-
rrtium in libras vasa empta habuixit.  x Plin.

lib. 36. sex millibus H.S. duo vitrei calices.

u Plin. lib. 37. cap. 2. LXXX fessertiis Calix
murrbinus ad tres fessarios capax.  x Plin.
ibid. H.S. CLM. Trullam unam emit mister
familias non Dives.  x Plin. Epist. ad Mar-
cum. Referebat ipse cum procuraret in His-
pania, vendere hos commentarios potuisse CCC
millibus numnum. (In eadem Epistola CLX)
mihmi reliquit opificiographos quidem & minu-
tissime scriptos.
mentaries, being 160 in number, to Largius Licinius for 400000 Nummi, 3229 l. 3 s. 4 d. He tells you in the same Epistle, that they were wrote on both sides, and in a small hand.

This is a greater Sum than Aristotle paid for a few books of Leuippus the Philosopher, viz. 3 Attick Talents, which Gellius saith make 72000 Nummi of Roman Money; both ways of reckoning, according to the Tables, bring it to 581 l. 5 s. which is a proof of the right analogy and correctness of the Tables.

Diogenes Laertius, in the life of Plato, saith that a few Books of Philolaus were purchase for 100 Mine, which Gellius interprets 10000 Denarri, both ways of reckoning bring it to 322 l. 18 s. 4 d.

The prices of the magical Books mention'd to be burnt in the Acts of the Apostles, is 5 Myriads of Pieces of Silver, or Drachms, that is 1614 l. 11 s. 8 d.

It is a proper occasion here to mention the rewards of Arts and Sciences. The customary Salary which Princes gave to their Physicians was 250 Sesteria, 2018 l. 4 s. 7 d.

Stertinius complained that he had only a Salary of 500 Sesteria, 4036 l. 9 s. 2 d. when he had by his private practice 600 Sesteria, 4843 l. 15 s.

This he made out by reckoning the Houses that paid him; which shews that the Physicians had yearly pensions from private Families.

One Vestius Valens, who seems to have been little better than a Student in Physick and Astrology, but familiar with Messalina, left Centes H.S. 80729 l. 3 s. 4 d. for publick Buildings in his own Country; having spent as much more in the same manner.
Tables of Ancient Coins,

A Brother of Stertinus, after having spent a great Estate on publick Works, left (as Budes has restored Pliny) Sestertium tricentaries, 242187 l. 10 s.

We have an instance of the Fees of one country Gentleman to a Physician, amounting to above 1600 l.

The rewards of Orators, considered as such, were greater among the Greeks than the Romans. Isocrates was paid by Nicocles King of Cyprus for one Oration, 20 Talents, 3875 l. But some are of opinion that here should be understood the small Talents mentioned by Plautus. Gorgias Leontinus must have been well paid for his Oratory, or else he would not have been able to reward himself so munificently as he did, by setting up his own Statue of Gold in the Temple of Delphi, the first of that kind.

The Roman Orators had more considerable causes to plead than the Grecian, viz. the causes of great Monarchs and States, and consequently their Clients were more able to pay them. But in those times they were not to be considered as pleading Advocates; when they came to be such, their Fees were fixed at 100 Aures in one cause, being at that time worth 80 l. 14 s. 7 d.

The same seems to have been the fixed Fee in Cicero's Time.

The Sum that was paid for Cicero's Head, may justly come into the account of Eloquence, being ten times more than that of any other proscribed Peron, viz. 25 Myriads of Drachms, 8072 l. 18 s. 4 d.

Vespasian, who was a penurious Prince, gave yearly Pensions to Greek and Latin Orators, 100 Sestertia, 807 l. 5 s. 10 d. which was double of that given to decayed Senators, being only 403 l 32 s. 11 d. A Generosity much exceeded in our own Nation.

We have in another place taken notice of Virgil's Estate, amounting to 80729 l. 3 s. 4 d. He was rewarded for the 21 Lines

\[
\text{De tempore Claudii. Statuuit modum usque ad dema sestertia. Appianus lib. 4. Ciy. Bell.}
\]

\[
\text{1 Ulpianus de honorario advocatorum. Licta autem quantitas intelligent pro fingulis causis usque ad centum aureos.}
\]

\[
\text{Tacit. in Vespasiano, Annae centena.}
\]

\[
\text{1 Tacit. in Nerone. Tacit. in commod. 9 Servius Gram.}
\]
Weights and Measures, &c.

Lines that are extant on Marcellus in his 6th Æneid, ten Sestertia a Line, that is 80l. 14s. 7d. The whole Sum amounted to 1695l. 6s. 3d.

One might say something here of the value of Offices in Rome, but it would be an inquiry inconsistent with the brevity I propose in the present Essay. I shall only observe that the ancient frugal appointments for Governors of Provinces was 20 Pound of Silver, two Horses, two Mules, two Robes, a Suit of wearing Cloaths, of bathing Cloaths one Suit, 100 Aurei, a Cook, and some other things mentioned in the quotation. All which could not amount to a very great Sum: and besides they were obliged to restore the Mules, the Horses, the Muletiers, and the Cook; and allowed to keep the rest only if they behaved themselves well.

Things were much changed when Piso, as Cicero alledged, having by the interest of Claudius obtained Macedonia, had allowed him only for Plate and other Vessels centes & octogies Sestertium, 145312l. 10s.

Pompey, when his Governments were continued to him for four Years, had a yearly Salary allowed him of 1000 Talents, 193750l.

Claudius payed for admittance into a Priesthood, not the high Priesthood, 64583l. 6s. 8d.

Cicero quinta contra Verr. Lampr. in Alexandro. Ita ut praefides provinciarum accipientur argentum visum, Mules & Equos binos, velites forefines binas, domesticas figulas, balneares figulas, aureos centenos, coquos figulas, & si nexores non habitarent, figulas concubinas, quod fine illis effe non posset, ceditur depositio administrationes mules, mulas, Equos, Mulliones & Coquos, cetera si habitur, si bene sigetur.

Cicero contra Plutarchum. Centes & octogies Sestertium valerii nomine decretum est.

Plut. in Pompeio. Sueton. in Claudio, Sestertium octogies pro Sacerdotii novi introitus equotes expendere.

Z 2 C H A P.
Tables of Ancient Coins.

CHAP. XIII.
Of Plate and Jewels.

In early times of the Empire, the Laws did not allow any considerable quantity of wrought Plate. A triumphal old Roman was censured for having five pound weight of Plate; another person was banished for twelve pound. The Carthaginian Ambassadors, by way of jest, said that the Romans were the most neighbourly people in the world, for they ate in everyplace where they were invited out of the same plate; and they were afterwards paid home for their joke: for Scipio Africanus brought of theirs to Rome in silver Vessels to the value in English money of 11966 l. 15s. 9d. which was all he could find in Carthage at that time; a quantity exceeded afterwards by the side-boards of many private Tables.

In another place the same Author saith, L. Scipio brought in to the value of 3934 l. 2s. 10d. and in Gold Vessels to the value of 64712 l. 5s. 8d.

After all this, Scipio Africanus left only to his Heir 32 Libra Argenti, 87 l. 8s. 7d.

They were better furnished with Plate 57 Years after, as Pliny observes, having thrown off their wonted modesty. After King Attalus's death, they began to bid high at the Auction of the Royal Goods.

Before

Weights and Measures, &c.

Before the Syllan civil War, there were at Rome 500 Dishes of 100 Pound weight a-piece, value of each being in English money, 273 l. 4s. 3d. besides the workmanship. The whole amounting to 13660 l. 2s. 10d. Those silver Vessels were sometimes the occasion of proscriptions to their owners. Likewise before Sylla's victory there were but two silver Triclinia at Rome.

C. Marius it seems was the first who drank out of a Silver Tankard, after the manner of Bacchus. In the latter ages of the Empire, they came to be extremely nice in the fashion of their Plate.

Drusilianus Rotundus, Slave of the Emperor Claudius, and Commisary in the hitherto Spain, is recorded for having one Vessel of 500 Roman Pound weight, which besides the Workmanship comes to 1366 l. 1s. 5d. And his eight Companions of 50 Pound a-piece, worth 1092 l. 17s. 1d.

There are Cisterns in England of more Weight than the greatest of these.

All these things were but moderate, and only extravagant in respect of the times in which they were done. For afterwards they had not only their Kitchen Vessels, but Coaches and Carriages of Silver. Heliogabalus had them of Gold and precious Stones. Julius Cæsar lay in a gold Bed with a purple Covering. They had Tables of Gold and precious Stones. I have mentioned before their extravagance in drinking Cups.

Petronius broke one worth above 3415 l. on purpose to disappoint Nero.

They had Candlesticks worth the Salary of a Tribunus Militum, which was 50 Sestertia, or 403 l. 12s. 1d.

They

Tables of Ancient Coins.

They had golden Shoes to their Horses and Mules, particularly Poppaea, Nero's Wife; who to preserve the fine Polishing of her Skin, used constantly a Bath of Aes's milk. They had golden Cloak-Stools. And yet there is a Story of a Prince Procopius that lived in Pompey's time, who out-did all this Magnificence. He treated 1000 Guests with a 1000 Gold Cups, and changed them as often as the Dishes.

The Romans were no less expensive in Jewels than in Plate. It has been commonly thought that Diamonds, the first in value and esteem, were not used in Ornaments; 'altho' there is a plain passage in Martial to the contrary. The way of cutting of Diamonds even contrary to the grain is amongst us a modern invention, but to cut them with the grain was known before. So far it is true that they were not so much used as Pearls, in which the Romans were exceeding prodigal. They wore them all possible ways, and so many that they called them Crotalia, from the noise and crackling of them. In short they were adorned with them from Top to Toe, their Stockings, their Shoes, and travelling Bed-Rooms, &c.

We have already mentioned Lotha Paulina, who by her Uncle's capacity in his Government, was enabled to wear in her common Jewels to the value of 3229s 6d. 13s. 4d.

*Julius Caesar* presented Servilia, Brutus's Mother, with a Pearl worth 45437 10s.

*Cleopatra* reproaching Antony for the meanness of his Suppers, at which he being surprized, she laid a Wager she would give him one

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9 Plin. lib. 33. cap. 11. Poppaea conjuncto Neronis principis delicatioribus jumentis suis tibias ex auro quoque induere.
‡ Ventris unus milio non te pudet accipis auro. Mart.
* Plin. ibid.
* Sardonychas, Smaragdos, Adamantas, alpídas, uno verít in articulo—— Mart.
Lib. 5. Ep. 11.
Weights and Measures, &c. 175

one Supper worth 8074 l. 3 s. 4 d. And after the first course, in which there was nothing extraordinary, she took one of her Pearls out of her Ears, dissolved it in Vinegar, and drank to him: she was preparing such another for him to pledge her, but was stopt by L. Plancus, who own'd she had won her wager. It would seem by this Story that both the Pearls were only worth Centies H-S, the Sum abovementioned, which would make them of less value than Julius Caesar's Pearl; if indeed one of them were worth the Sum abovementioned, then Cleopatra's Pearl was the more valuable. What this Lady did, was highly gallant, but the manner of using the remaining Pearl was directly barbarous, for they divided it in two, and made a pair of Earrings of it for the Venus in the Pantheon.

Pearls increased in value, as they increased in weight, and excelled in fine Colour. * Pliny faith that a few had exceed'd a Roman half Ounce, by one Scruple, that is in English weight, of an Ounce and 3.4 Grains.

Budeus faith he had seen one that weighed 4 of a French Ounce. Precious Stones at Rome, as to their value, stood in the following order. * First, the Diamond, whereof Pliny mentions one of the bigness of a Walnut, next the Pearl, then the Emerald, after them came at a great distance the Opal, * of which Nemius had a ring, worth 16 l. 9 s. 2 d. the only thing he reserved of all his Fortune when he was proscribed. There are some Sizes of Emeralds which
Tables of Ancient Coins,

which the Author himself thinks incredible, particularly that mentioned by *Theophrastus, sent by the King of Babylon to the King of Egypt, of four Cubits length, and three in breadth. The Obelisk in the Temple of Jupiter 40 Cubits high, made of four Emeralds; which could not be genuine.

For the Toy that was brought to Rome in the third Triumph of Pompey, the publick Records are quoted: It was a sort of a pair of Tables for gaming, made of two precious Stones, 3 foot broad, and 4 foot long, which with other things there described would have made a fine Raffle. I likewise leave to the faith of the Reader the dimensions of those Carbuncles, which the Indians will scoop so as to hold above a Pint.

*Pliny himself saw a Jasper of eleven Ounces, which was cut into Nero's Figure. *Cicero mentions a Cup made of a hollow Gemm with a golden Handle.

There was a particular Census for the wearing gold Rings, *viz.* he must be a Gentleman descended of a Father or Grandfather worth 3229l. 3s. 4d.

They made vessels of Gemms to hold their Ice for their Wine.

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*a* Cap. 5. *Theophrastus tradit in Ægyptiorum, commentariis repetiri, regi eorum a rege Babyloniorum missum flamaragum quattuor cubitorum longitudine, trium latitudine. *

c Cap. 7. *Plin. ibid.*

e Cap. 7. *Plin. lib. 33. cap. 2. Ne cui jus id effet, nisi cui ingenuo ipsi patri avoque paterno festetto CCC. census futus.*

f Pacat. in Panegyr. Parum se laudatos putabant, nisi stativam in gemmis capacibus glaciem falerna frigissent.
CHAP. XIV.

Of Gaming and Funeral Expences.

Another piece of Expences is Gaming. The Romans are censured by the Poets for that vice. *Augustus himself was very fond of it, and continued so even in his old age. There is a passage of an Epistle of his to Tiberius, recorded by Suetonius, * which I have set down in the quotations: the substance of it, as far as it relates to our present purpose, is, that he played at a game of Chance two Days successively, and lost 20,000 Nummi, which is 16 l. 9 s. 2 d. that if he had not been too generous in giving away Sums, and forgiving Debts, he had been a gainer of 5,000 Nummi, or 403 l. 12 l. 11 d. Now the Game was so contrived that one particular cast took up the whole Stake, when some others came up you laid down. Augustus and his Play-fellows at this Play only staked Denarii, or 7½ d. and at such low stakes you see one might come off a gainer of 403 l. 12 s. 1½ d. It is suppos'd, * that this was the Play at which Nero staked instead of Denarii, 32 l. 3 s. 4 d. upon every cast. Where did he find Play-fellows?

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*a Sueton. in Augusto. Inter caenam luxum geniatum et heri & hodie. Talis enim jactatis, ut quicumque canem, aut fenionem miferat, in singulos talos singulos denarios in medium conferebat: quos tollebat universos qui vennerem jecerat. Et rursus alii literis, Nos, mi Tiberi, Quinque tria satis jucunde egimus. Luxumus enim per omnes dies, forumque aleatorium calefecimus. Frater tuus magnis clamoribus rem geffit. Ad summum tamen perdiderit non multum: sed ex magnis detrimentis, prater spem saullatim retractus est. Ego perdidi viginti millia nummum, meo nomine: sed cum effuSE in lustu liberalis suissem, ut soleo ple rumque. Nam si quas manus remisit cuique, exegisse, aut retinuiisse quod cuique donavi, vicissim vel quinquaquinta millia. Scribit ad filiam; Mibi tibi denarios ducentos quinquaginta, quos singulis convivis dedee, si vellet inter se inter cenam vel talis, vel par impar ludder. Augustus must have been a lover of Game, when he sent 8 l. 1 s. 5½ d. to his Guests to play at even and odd. b Sueton. in Nero. Quadrigenus in punctum H-S. alcuam lust.
Tables of Ancient Coins.

So much of the Expences of the Living: the Expences of the Dead were still more extravagant.

Memmius Agrippa was buried by a Contribution of about half farthings a-piece among the People, I think there were 100000 contributors, and the whole Summ exactly calculated comes to 531.16s. 4d. which is a pretty great Sum, and shews a disposition to Extravagance in those times, as to Funeral Expences.

On Sylla's Funeral Pile were cast 210 feretra, or biers of Spices, which considering the dearness of that Commodity at Rome, must have amounted to a vast Sum; besides his own, and his Litter's Statue, made of Incense and Cinnamon, as big as the Life.

Nero in Poppæa's Funeral burnt more Cinnamon and Cassia, than the whole yearly Product of Arabia.

It were endless to relate the immense Funeral Piles, the costly Garments, Gold, Silver and Gemms that were consumed on these occasions, the expensive Feasts to the people, the funeral Plays or Diversions, particularly those of the Gladiators, their stately Sepulchres; a hundred pair of Gladiators were very frequent.

Julius Caesar, in his Father's Funeral, had all the Apparatus of the Arena of Silver.

One Curio at the Funeral of his Father built a temporary Theatre, in imitation of that of M. Scaurus before described. It consisted of two parts balanced and turning on hinges, according to the position of the Sun for the conveniency of Forenoon's and Afternoon's diversion. It was a most extravagant thing.

The Expences of Nero's Funeral were not great, being only 1614l. 11s. 8d.

Q. Minutius Anteros, a libertus, left by will a yearly revenue of 80l. 14s. 7d. to celebrate his Memory.

CHAP.
Weights and Measures, &c.

C H A P. XV.

Of Soldier's Pay.

There are a great many disputes amongst the learned about the rate of pay of Roman Soldiers. I take that matter to have stood thus. In the early times of the Commonwealth, a Horseman received yearly Tria millia Aëris, and a foot Soldier one Mille, that is, reckoning according to the common value of the As, somewhat more than 6 pence a-day to a Horseman, and 2 pence to a foot Soldier. This pay was afterwards increased to Quini, or five Asses to a foot Soldier. Polybius calls it διὸ οὐκολάς, which exceeds five Asses by a Triens, or a third part of an As. But he is to be understood as speaking in a round number. This, considering the Diminution of the Brass Coin, was really less in value, or weight; but more in tale. Julius Caesar doubled this pay of 5 Asses, and made it ten, which was called a Denarius. Afterwards Domitian (according to Suetonius, in Domitiano Cap. 7.) addidit & quartum Stipendium Militii Aureos Ternos, that is, Domitian added three Aurei as a fourth reckoning or pay to the Soldiers. About the interpretation of which passage there are great disputes among the Criticks. In order to come at the true sense of it, Gronovius has compar'd it with another passage to the same purpose in Zonaras, which runs thus, τοῖς ορθίωσι ἐπηκέφει τὴν μεθορίαν, τάχα διὰ τὴν νίκην πέτε γὰ τῇ ἑπτάμυψια δεκαμίας ἐκάτον λαμπρανόμενος, ἐκατὸν ἐκέλευσεν δίδοις. The sense of which passage is, that he order'd for the Soldiers 100 Denarii, instead of 75, which they received before. The most plain account of the whole matter then is, that the Soldiers receiving 10 Asses a-day, made 300 Asses in a Month of 30 Days; consequently
consequently in 4 Months, 1200 Asses: about the time of the diminution of the Brass Coin, when perhaps the Soldier's pay was likewise chang'd, as Pliny tells us (in a passage formerly quoted) the Denarius was chang'd for 16 Asses; and it's probable that they were continued to be reckon'd to the Soldiers on that foot, consequently 1200 Asses, or four Month's pay, made 75 Drachmae or Denarii: And the Aureus exchanging for 25 Denarii, four Months pay came exactly to 3 Aurei at one payment. Domitian increasing this 75 Denarii to 100, added one Aureus more to each payment, or 3 Aurei in a Year, which was properly speaking quartum stipendium; the Soldiers instead of 9 Aurei receiving now 12. Therefore tho' the daily Pay of a Denarius according to the analogy of the Tables ought to be reckon'd at 7½d. a-day; it was really, according to the above-stated account, under the value of 5 pence before Domitian, and about 6 pence after this additional pay.

The Cohortes Praetoriae & Urbane, which one may translate Guards, had double Pay, or 2 Denarii a-day assign'd them by Augustus. Those Troops who were commonly the most vicious, and not most valiant, by their Post had greater Influence on the Affairs of the Government, and even in disposing of the very Empire itself, than the other Troops, and therefore were more consider'd, not only in the Pay, but the Donatives.

If we take the price of Day-labour from the pay of Soldiers, it will not make it at a much higher rate in Rome than in our own Countrey. I cannot tell by what chance, but the most honourable Profession of a Foot Soldier has always been reckon'd as one of the lowest kinds of Day labour, and it has cost Mankind less to kill their own Species, than any other sort of Animal.
CHAP. XVI.

Of the Donatives given to the Soldiers.

The reward for the third spolia opima, was 100 Asses, or 6s. 5d. for the second 200 Asses, or 12s. 11d. and the Reward for the first spolia opima was 300 Asses, or 19s. 4½d. spolia opima were Spoils taken from the commanding Officer of the Enemy. These small Rewards shew the Scarcity of Money in the early days of Rome: for I think this Reward was ordered by Numa Pompilius.

Lucius Lentulus gave to each of his Soldiers, out of the Booty, 120 Asses, 7s. 9d.

Cornelius gave to each Foot Soldier, 70 Asses, 4s. 6½d. double to that of the Equites, 9s. 1d. and triple to the Centurions, 13s. 7½d.

Eight hundred Asses were given to each Foot Soldier, or 2l. 11s. 8d. and to the Equites and Centurions triple that Sum, 7l. 15s.

Two hundred and fifty Asses were given to each Foot Soldier, 16s. 1¼d. double to the Centurions, 1l. 12s. 3½d. and triple to the Equites, 2l. 8s. 5½d.

Two hundred and seventy Asses were given to each Foot Soldier, 17s. 5½d. and triple to the Equites, 2l. 12s. 3½d.

Four hundred thousand æris were distributed among the Soldiers, 1291l. 13s. 4d.

Pub. Cornelius gave to each of his Soldiers, 125 Asses, 8s. 0½d.

Forty two denarius were given to each Soldier, that is, 1l. 7s. ½d. and double that to the Centurions, 2l. 14s. 3d.

Scipio
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Scipio Africanus gave to each of his Soldiers 40 Aères, 2 s. 7 d.

The Legati received each of them 5000 Aères, 16 l. 2 s. 11 d. and their Comites, 1000 Aères, 3 l. 4 s. 7 d.

Paulus Æmilius gave in a Donative to his Soldiers 12 Drachms per man, that is 7 s. 1 4 d.

Lucullus gave to each of his Soldiers 950 Drachms, 30 l. 13 s. 6 4 d. After the taking of Tyranocerta, he gave to each 800 Drachms, 25 l. 16 s. 8 d. out of the Spoil taken from Tigranes's Army, and besides left the Town to be plundered by them, all except King Tigranes's Treasure, where among other riches he found in ready money 8000 Talents, 1,550,000 l.

A. u. 693. Pompey, after he had overcome the Pyrates, Asia, Pontus, &c. in his Triumph gave to the Publick and the Quæstoris, who had defended the Shore a thousand Talents, or 193,750 l. and unto each Soldier 6000 H.S. 48 l. 8 s. 9 d.

By this time the Riches of the Romans began to encrease, and the Spoils of the conquer'd Countries could afford greater Sums to the Soldiers.

Julius Caesar's Donatives were very great. At one time to each Soldier of the Veteran Legions he gave 16 l. 2 s. 11 d. and to the Equites, 193 l. 15 s.

Dio mentions another Donative of his amounting per man to 20 l. 14 s. 7 d.

Appianus makes another Donative of his amount per man to 5000 Attick Drachms, or 16 l. 9 s. 2 d. Double to the Leader of a Company, or 322 l. 18 s. 4 d. To the Tribuni Militum and the Equites double of this last Sum, 645 l. 16 s. 8 d.

Plutarch

S Liv. lib. 10. Decad. 3. Plut. in Paulo Æmilio.

i Plut. in Lucullo. ii Plin. lib. 37. cap. 2. Republica & Quætoribus, qui oram maris defendissent datum mille talentum, militibus singulis sana millia seftertium.

k Suet. in Cæsare. cap. 38. Veteranis legionibus prædes nomine in pedetes singulos super bina seftertia, que iniitio civilis tumultus numeravit in equites vicena quaterna millia numerum dedit. i Dio. lib. 46. m Appian. lib. 2. Bello. Civil.
Weights and Measures, &c.

Plutarch takes notice of another Donative to Caesar's Soldiers for a Sacrifice, per man, 3 s. 2 1/2 d.

*Brutus* gave per man 1 l. 12 s. 1 1/2 d.

I read little of Antony's Donatives, *but only that he promised to each Soldier that would throw Papers into Caesar's Camp, 48 l. 8 s. 9 d.*

*He gave once to each Soldier of the Legions 1 l. 2 s. 7 1/2 d.*

*Augustus Caesar gave to each Soldier of the Praetorian Bands, after he had served 16 Years, 16 l. 9 s. 2 d.* He left to each Soldier of the Urbane Cohortes, 4 l. 0 s. 8 1/2 d. To the Praetorian Soldiers, 8 l. 1 s. 5 1/2 d.

The Roman Soldiers had sometimes a great Booty, but it was most commonly regularly distributed to them; particularly at the taking Alexandria, they had per man 8 l. 1 s. 5 1/2 d. to save the Town.

*Caligula* gave to each Soldier 2 l. 8 s. 5 1/2 d.

*Suétionius* faith he gave them 100 Denarius, 3 l. 4 s. 7 d. as a Sum exceeding all that had been given before, and bid them go away and be merry and rich, whereas it's plain his Donative fell much short of the Sums above-mentioned.

*Claudius* gave to each Soldier at once the same Sum as Caligula, viz. 2 l. 8 s. 5 1/2 d.

*Claudius* promised when he was made Emperor, 12 l. 1 s. 10 1/2 d. being the first of the Caesars, as Suétionius observes, that run a-tick with the Soldiers.

*Nero* promised the Soldiers 113 l. 0 s. 5 d.

*Nero* gave to each of the Manipules 2000 H-S. that is 16 l. 2 s. 11 d.

*He laid out on Donatives at several times* 17,760,416 l. 16 s. 4 d.

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Galba

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*In Caligula. cap. 46. Pro­nuntiatoque militi donativo centenis viritim denarius, quasi omne exemplum liberalitis sup­pergessum, abite, inquit, laeti, abite locupletes.*

*Dio lib. 60. *   *Suet. in Claudio. cap. 10.* Armatos pro concione jurare in nomen suum passus est, promitque singulis quina dena H-S. primus Caesarum titem militis etiam præmio pignoratus est.*   *Philip Chronic. lib.*   *Tác­tit. lib. 15.*   *Tác­tit. lib. 17.*
Tables of Ancient Coins,

Galba was very close-handed; I have not read much of his Liberalities. But Otho used to bribe his Guards at a very high rate; for as often as Galba supped with him, he used to give every Soldier upon duty an Aureus, 16 s. 1½ d. Plutarch and Suetonius call it one Aureus. Tacitus calls it 100 Sesterii. The Emperor's Guard consisted of a thousand Men, so that the whole Sum came at every Supper to 807 l. 5 s. 10 d.

Otho gave in the Beginning of his Reign a Donative of 40 l. 7 s. 3½ d.

There is one Donative of Vittelius mentioned, of 16 s. 1½ d.

There was likewise a Donative of the Emperor Marcus Antoninus of 96 l. 17 s. 6 d.

And the Emperor Lucius his Colleague gave 161 l. 9 s. 2 d.

Pertinax promised 96 l. 17 s. 6 d.

Pertinax himself affirms that he gave to the Soldiers 6750 Myriads of Drachms, that is 2179687 l. 10 s.

Julian promised to each Soldier, when he stood for the Empire, 20 l. 16 s. 5½ d.

Even the Deputy Kings of the Romans gave their Donatives to their Soldiers. Herod at his Death left each of them 1 l. 12 s. 1½ d. He had given in his Life-time at once 4 l. 16 s. 4½ d.

These are some Instances not only of the Roman Riches and Magnificence, but of the Respect which they knew was due to a standing Army, who had the Disposal both of them and their Empire.

d Plutarch. in Othone.
e Dio in Vitellio.

f Dio. in Pertinace.

g Dio. in Juliano.
h Joseph. lib. 17. cap. 9.
Weights and Measures, &c.

C H A P. XVII.

Of the Congiaria of the Emperors, or Gifts to the People.

The Roman Emperors were the only Monarchs that gave back their superfluous Money to the People, which no doubt was good Policy, because the Money was of more use when it circulated amongst the People than lying in a dead Treasure; especially since it could command it back again, when they had occasion for it. It was still a greater Advantage to the People, because it was not their own, but Money raised on other conquered Nations. A short Account of some of these Congiaria is as follows.

"By Julius Caesar, besides ten Modii of Corn and ten Pound of Oyl, was given to each Citizen 400 Nummi, or 3 l. 4 s. 7 d."

"By the same, 75 Drachms, 2 l. 8 s. 5 ½ d."

Tho' I believe it is the same with the former Donative, only omitting the 100 Nummi that was mentioned in the former quotation by Suetonius. The same Sum is mentioned by Plutarch, and called 75 Drachms. "He bequeathed to the People per Man 75 Drachms, 2 l. 8 s. 5 ½ d. or as some say, only 25 Drachms, 16 s. 1 ½ d."

"Augustus gave frequent Congiaria to the People, sometimes of 30 Nummi, or 4 s. 10 ½ d. sometimes 40 Nummi, or 6 s. 5 ½ d."

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*a* Suet. in Cæsar. cap. 38. Populo præter erat, viritim divilfit, & hoc amplius semetenos pro frumenti denos modios ad totidem olei libræ, mora.  
*b* Dio. lib. 44.  
*c* Ibid.  
*d* Suet. in Aug. cap. 41.
sometimes 250, 2 l. 2 s. 1 d. not omitting the very Children, tho' the common Custom was not to give to any under the Age of eleven. *Eusebius* in his Chronicle writes, that after the Victory of Atilium, there were reckoned of Roman Citizens 4,160,000. And by the *Census* that was made at the Nativity of our Saviour there were reckoned 93,700,000. Suppose only that there were two Millions of these that received the forementioned Sum of 2 l. 2 s. 1 d. it would amount to 4,036,458 l. 6 s. 8 d.

*Augustus* left by his Testament to the common People, per Man, 2 l. 8 s. 5 1⁄2 d.

The same Author mentions another *Congiarium* of his of 60 *Drachms*, or 1 l. 18 s. 9 d. and the Number that did partake of this Liberality was only 100,000, so that the whole amounted to 3,875,00 l.

*Suetonius* saith that he left to the People of Rome 3,229,16 l.; 13 s. 4 d. and to the Tribes 2,825 l. 4 s. 2 d.

Tiberius gave a *Congiarium* of 300 *Nummi*, 2 l. 8 s. 5 1⁄2 d.

Tiberius was noted for his niggardly Temper, he used only to give to his Attendants their Dyers, but once he was taken with a Fit of Generosity, and divided them into three Classes according to their Dignity; to the first he gave 600 *Sestertius*, 484 l. 19 s. to the second 400 *Sestertius*, 329 l. 3 s. 4 d. to the third 200 *Sestertius*, 161 l. 11 s. 8 d.

In such a Suit as a Roman Emperor had, this would exhaust a large Civil List. *There is another Liberality of his mentioned, very judicious and generous; to the Citizens who had suffered Damage by a great Fire he gave* Millies H-S. 807,29 l. 13 s. 4 d.

*Caligula* gave a *Congiarium* of 60 *Drachms*, 1 l. 18 s. 9 d.

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*e. Dio. lib. 56.*  
*f. Ibid. lib. 55.*

*g In Augusto cap. 41. Legavit pop. Romano quadrimgentier, tribubus tricies quinquies. H-S.*

*h Suet. in Tiberio, cap. 20.*

*i Ibid. cap. 46. Pecuniae parcae ac tenax, comites per-regnationum expeditionumque nunquam Salario, cibariis tantum sustentavit: una modo libe-ralitate ex indulgentia vitrici prosecutus cum tribus classibus fatis pro dignitate cujusque, primo sexcentis sestertius, secundae quadrimgenta dicitur, ducenta tertiae, quam non amisit, fed gratorum appellat.*

*k Suet. ibid.*

*Dio. lib. 58.*

*i Dio. lib. 59.*
Weights and Measures, &c.

He paid likewise a Legacy of Tiberius of 1125 Myriads of Drachms, 363281 l. 5 s.

Nero gave a Congiarium of 400 Nummi, 3 l. 4 s. 7 d.

The same is mentioned by Tacitus.

Nerva gave at once in land to the value of 484375 l. to relieve poor Citizens.

Adrian laid he had lost 3229166 l. 13 s. 3 d. which he had given to the People and Soldiery for the Adoption of Commodus, who proved unfit for the Empire. This shews you to what immense Sums the Ambitus or bribing for Offices had come to.

Antoninus Philosophus gave a very large Congiarium of no less than 8 Aurei, 6 l. 9 s. 2 d. which Dio saith was greater than ever they got before.

His Son Commodus gave 725 Denarii, 23 l. 8 s. 2 d.

Severus gave a Congiarium of 10 Aurei, which came to 5000 Myriads of Drachms, 1614583 l. 6 s. 8 d.

The Ambitus or bribing for Offices was very expensive. Milo when he stood for the Consulate gave to each Voter 32 l. 8 s. 10 d.

Sabinus Nymphidius promised to each Soldier of the provincial Legions 40 l. 7 s. 3 d. that they might chuse Galba Emperor.

Claudius promised the Soldiers per Man 113 l. 0 s. 5 d. if they would make him Emperor.

Julian promised to the Soldiers per Man 201 l. 16 s. 5 d. to chuse him Emperor.

Otho promised 403 l. 12 s. 11 d. to those that were to assassinate Galba, of which there was paid in ready Money 80 l. 14 s. 7 d.

However this was no extraordinary Price for the Life of an Emperor; nor is it an extraordinary Sum that is mention'd by

Salute,

Suet. in Nerone cap. 10.
Dio. in Nerva.
Spartian. in Adriano.
Dio. in Antonio.
Lampridius in Commodus.
Tacit. in Severo.
Plutarch. in Galba.
Philippus lib. 3.
Dio. in Chronicl.
Dio. in Othonis.
Tables of Ancient Coins,

Salust, given to two Spies in Catiline's Conspiracy, viz. to one 807 l. 5 s. 10 d. to another a Freeman 1616 l. 11 s. 8 d.

Otho bribed one of Galba's Servants with 8072 l. 18 s. 4 d.

Paulus the Consul was bribed by Caesar himself with a Sum of 56510 l. 8 s. 4 d.

Plutarch, who mentions this, saith afterwards, that he was brought over to Caesar's Party by the Sum of 290625 l.

There are two considerable Bribes mention'd in Law-Suits, one of 8072 l. 18 s. 4 d. which Dio was obliged to pay for common Justice. Another of 5166 l. 13 s. 4 d.

Gabinius was accused of taking a round Sum of 1937500 l.
The Ambitus came at last to 80729 l 3 s. 4 d. per Tribe, and there were 35 of them.

Capito Cossulianus according to Tacitus lib. 12. for bringing in Thraseas Patus guilty, got a Reward of quinquages H-S. 4008 l. 6 s. 8 d.

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C H A P. XVIII.

Of the Revenues of the Roman Empire.

It is much to be regretted that there is not in any Author a Computation left us of the Revenues of the Roman Empire, and hardly any Memoirs from whence it might be collected. Those of the Moderns who have wrote upon the Subject, have rather made a Collection of some Passages of Authors obscure, and sometimes inconsistent, than given any methodical Account, from whence they may be reduced to Numbers. All that was possible for me to do in this Uncertainty, was to gather some matters

Gai. Cicer in Cluentio.
Weights and Measures, &c.

matters of Fact together, which I shall lay before my Readers, leaving those of more Skill to make their Inferences from them. Augustus carried a Rationarium of the Empire in his Pocket. It was certainly a very great Curiosity, and a Loss never to be retriev'd.

In considering the Riches of the Roman Government, one must in the first place look upon them originally as Proprietors of all the Land in their Dominions, which being acquir'd by Conquest, was dispos'd by them according to their Pleasure. We read of the Vettigales Agri, which were Lands taken from the Enemy divided into Centuries or Hundreds, and distributed amongst the Soldiers, new Colonies, Cities, or left in the Hards of the original Proprietors, under the Condition of paying such Duties, which as long as they paid, they entitled them and their Heirs to the perpetual Possession. It appears by a Passage in Pliny Epist. 7. that this Revenue was commonly reckon'd ad Rationem usurae trientis, or four per Cent. This is somewhat obscurely express'd: if it is meant of the Value of the Purchase, it was very high; it being hardly possible to make so much of Land, unless it was reckon'd at a very low Price. These Lands were sometimes called Ques-torii, from their being put to Sale by Ques-tors or Commissioners for that purpose. Sometimes those Lands were out upon Leases of Lustra or four Years, after the Expiration of which Term the Tenants were obliged to renew. There were Lands called Assig-nati, which were entirely divided among the Veterans with the Obligation only of certain Services, and the Proprietors might dis-pose of them on the same Condition. The Reader may see long but not very clear Accounts of these Matters in Hyginus de Limitibus.

The Roman Taxes, in the more early times of their Empire, consisted chiefly in Vettigalia and Tributa. The Vettigalia were of three sorts, from Tillage, Pasturage, and Carriage of Goods.

*The Tax upon Tillage may be reckoned at two Shillings in the Pound in arable Ground, and four Shillings in Plantations. This

* Appian. lib. i. Civil. άεδήγνς & άμ κοινοποιεί. αφεπίφ & άς ποιεωνείν.
Tables of Ancient Coins,

This Tax was often levied in kind upon Corn, and called Decumna or Tithes. Cicero speaks frequently of these Decumna in Sicily, in his Orations against Verres. The Tax upon Pasturage was raised according to a certain Rate, per head, upon Cattle. It was called Scriptura. There is a Passage in the Theodosian Code which states this at four Silique the head, or 5d.

The Portorium or Tax upon Carriage, was what we call the Customs upon Trade and Shipping; it was exacted in Harbours, Rivers, and sometimes in the Passage of Bridges, at different Rates in different times, Goods and Countries. It sometimes amounted to the fortieth or fiftieth Part, and in some Cases very near half the value of the whole Goods.

Tributum, properly speaking, was a Tax upon Individuals; one sort of it was called Capitatio, a Pole-tax. Besides the forementioned Taxes, there were several Excises, as that formerly mention'd laid on by Cato, upon Luxury and Expenses, which perhaps was only temporary. There was a Salt Tax laid on very early. Lucius Martius made the first Magazines of Salt. Salarium or Salary is derived from Salm.

The Census was a Valuation of the Estates of Particulars for a Rule of Taxing to the Government as Occasion serv'd; and is improperly confounded with the Capitatio.

Afterwards there was such a Multitude of Excises laid on, by the Emperors, that there was hardly any thing escap'd; as the Vettigal Macelli, a Tax upon Meat: which was, once taken away, as a Grievance, but imposed again in Caligula's time. A Tax upon Metals, and by the Pappian Law the tenth of Inheritances of such as died without Heirs. Vettigal Lupanarium & Matrimoni, a Tax upon Stews and Marriages. Five per Cent. upon manservants and Slaves. Four per Cent. on Slaves that were sold. A Tax upon Auctions. The Tributum Artificiorum, a Tax upon Tradesmen. Vettigal Fluminum. Edilium Tributum, upon Plants. A Tax upon

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b Velleius Paterculus.

d Suet. in Calig.

e Liv. lib. 31.

f Dio. lib. 55.

g Suet., in Auguli.

h Cic. lib. 2. Epist. ad Attic.

i Boadicea apud Xiphilinum.
Weights and Measures, &c.

upon the dead. A Tax upon Urine and Dung called Chry-
ungyron: from which perhaps the Expression of Gold-finders
may come. Besides these and several others too numerous to
mention, there were voluntary Oblations of the Senators: and to
sum up all, at last they tax'd k Fumum, Aerem & Umbram, Smoak,
Air, and Shade.

Another Fund of Riches of the Roman Government was the
Treasure that they plunder'd from their Conquests, in Specie, Jew-
els, Plate, &c. Some Particulars of which remain upon Record,
and are as follows.

Paulus Aemilius, after he had overcome Perseus King of Mac-
donia, brought into the Treasury H-S. MM. CCC. 1.856770 l.
16 s. 8 d.

Seipid having conquered Antiochus, brought to it Bis Millies,
1.614583 l. 16 s. 8 d.

Before the third Punic War, when Sextus Julius and Lucius
Aurelius were Consuls, there was in the Treasury, of Gold 16810
Pondo, which reckoned in the ducal Proportion is 455971 l. 5 s.
Of Silver 22070 Pondo, 59864 l. 17 s. 6 d. And of coin'd
Money Sexages Bis, and 85400 H-S. 50741 l. 10 s. 2 d. which
in all comes to 566577 l. 12 s. 8 d.

When Sextus Julius and L. Marcius were Consuls, there was
in the Treasury 1.920829 Pondo of Gold, 52.102486 l. 12 s.
6 d.

This is according to Hadrain's Explication of Pliny's Numbers,
but the Sum seems too extravagant, and perhaps the Numbers are
not correct.

Cesare brought at once to the Treasury 65000 Talents,
12.593750 l.

And

k Zonaras.
1 Plin. lib. 33. cap. 3. Intuit Paulus Aemilius, Perseus victor, & Macedonica praeda H-S. MM. CCC.
m Idem.
lib. 38. Auri in Aesario populi Romani sunt, Sex. Julio, L. Aurelio Coss. Septem annis ante bellum Puni-
cum tertium pondo xvi. dccc. argenti.
xxii. lxx. & in numerato lxii. lxxv. cccc.
o Idem ibidem. Item Sex. Julio, L. Marcius consuls, hoc est bellum socialit. initio auri
xxv. xx. dcccxxix.
p Plutarch. in Cesare.
And when he first enter'd Rome in the beginning of the Civil War, he took out of the Treasury 25000 Pondo of Gold, 678125 l. 35000 Pondo of Silver, 94937 l. 10 s. and in Coin H-S. CCCC. 322916 l. 13 s. 4 d. which three Sums amount to 1095979 l. 3 s. 4 d.

'Tiberius left in the Treasury vicies septies millies, 21.796875 l.

Some other Conjectures, concerning the Value of the Revenues of the Empire, may be made from such Memoirs as are left us of the Revenues of particular Provinces. Appian, who was cotemporary with Adrian, in the Preface of his History, thus describes the Bounds of the Roman Empire: In Africa, Hercules's Pillars and the Eastern Ethiopians; in Asia, the River Euphrates, Mount Caucasus, the beginning of the greater Armenia, and the Colchi inhabiting about the Euxine Sea; in Europe, the Rhine, and the Ister or Danube, comprehending all the Islands belonging to these Countries.

To begin with Egypt: Appian, speaking of its Forces, faith that in the Reign of the second King after Alexander, there was in the Egyptian Treasury 74 Myriads of Talents, or 191.166666 l. 13 s. 4 d.

'Strabo quotes Cicero, mentioning the Revenue of Egypt to have been (in the time of Auletes, Father to Cleopatra) 12500 Talents, 2421875 l.

He adds, that if Auletes, who was a very negligent Prince in the Administration of Affairs, made so much, what must now the Romans make, who govern it so wisely; especially since the Indian and Troglodytick Trade had greatly augmented the Revenues?

Plin. lib. 33, cap. 3. C. Cæsar primo introitu urbis in civili bello suo, ex erario profulit laterum aureorum xxxv. m. argentorum xxxv. & in numerato, H-S. CCCC.

Suetonius in Caligula.

'The Athenians, πάντας απ' της Αθηναίας προσέρχοντα, διέπανα την Κίπρον προς ομοφωσια, κατ' έκειναν της Κελπον.
Weights and Measures, &c.

Agrippa, in his Oration to the Jews, recorded by Josephus, tells them that the Roman Empire had seventy five Millions of Inhabitants paying Taxes, besides the People of Alexandria (which City, as he there describes the Dimensions of it by Stadia, was near three English Miles and a half in Length, and half of that in Breadth) and, faith he, besides furnishing Rome yearly with four Months Provision of Corn, pays more Taxes in a Month than you do in a Year. And what Judaea was tax'd at, may in some measure appear from the following Particulars. *Cæcilius, after Cæsar's Death, rais'd out of it 700 Talents, 135625 l. *And Herod left to Cæsar 1000 Myriads, 322916 l. 13 s. 4 d. and half of that to his Spouse, 161458 l. 6 s. 8 d.

Vespasian imposed a Didachem as a Pole-tax on that Nation, vix. 1 s. 3 1/2 d. *And their Number being reckon'd seven Millions, that Tax will amount to fourteen Millions of Drachms, 452083 l. 6 s. 8 d.

Then if we reckon twelve times as much for the Taxes of Alexandria, according to Agrippa's Speech, they will come out 168 Millions of Drachms, 5425000 l. But it will be fairer to reckon it twelve times the sum of Cæcilius, vix. 1627500 l.

It's certain the Customs of Alexandria were very great, it having been the Staple of the Indian Trade, which alone, according to Pliny, carried yearly out of Rome quingenties H-S, 403645 l. 16 s. 8 d. And with some other Branches mention'd by the same Author, there was yearly carried out of Rome, Centies, or 807291 l. 13 s. 4 d.

*The Carthaginians, after Hannibal's Overthrow, paid the Romans yearly only 200 Talents, 38750 l.

The Revenues of Asia in the time of Darius were not very great; for, according to Herodotus, all the Revenues in Money which Darius drew from Asia, Egypt and the Indies amounted only to 7740 Babylonian Silver Talents, 1749562 l. 10 s. and 360 of Gold,

* Josephus lib. 2. de Bell. Judaico
* * Idem ibid.
* Idem lib. 7.
* * Lib. 6. cap. 23. Digna
* Idem anno Imperii nostri minus H-S. quingentes exhaerenti India, & merces remitlete qua centuplicato veneunt.
* * Livius.
Gold, which *Herodotus* reckons thirteen times the Value of so many Silver Talents, or 1,057,175 l. in all making 2,807,437 l. 10 s.

*Cicero* reckons *Asia* for its Fruitfulness, and the great Quantities of Commodities for Exportation, far above all other Countries. *Appian* saith that *Sylla* ordered *Asia* to pay four Years Tribute, which *Plutarch* tells us was 20,000 Talents, 3,875,000 l.

And therefore in *Sylla's* time the yearly Tribute of *Asia* was 5,000 Talents, 968,750 l.

*Plutarch* likewise relates that before *Pompey's* time, the Tribute of *Asia* was only 5,000 Myriads of Drachms, 1,614,583 l. 6 s. 8 d. but that by his Conquests it was augmented to 8,500 Myriads, 2,744,798 l. 13 s. 4 d. yet *Plutarch* saith that *Antony* made *Asia* pay at once 20 Myriads of Talents, 38,750,000 l.

But *Appian* writes that this Sum was the Tribute of ten Years; so that in *Antony's* time the yearly Tribute of *Asia* was 2 Myriads of Talents, 3,875,000 l.

As to *Gaul*, *Caesar* exacted from it yearly quadrimgenties, 3,229,161 l. 13 s. 4 d.

*Lipsius* is of opinion that quattuormillies should be read for quadrimgenties, which would make the Sum ten times bigger, *viz.* 32,291,661 l. 13 s. 4 d.

But it is not probable that *Gaul* would be able to pay such a Sum yearly, immediately after long Wars. However *Pselleius Patroclus* affirms that *Gaul* was reckoned on the same Footing with *Egypt* as to Taxes.

There are no Passages in old Authors, whereby the Tribute of *Spain* can be found; no doubt it was very great, on the account of the Mines. *Strabo* tells that the Mines at *Carthage* yielded the Romans per diem to the Value of 25,000 Drachms, 807 l. 3 s. 10 d. which per annum makes, 294,661 l. 9 s. 2 d.

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c *Europius*, lib. 6.
Weights and Measures, &c.

Hannibal got per diem out of the Spanish Mines 300 Pondo of Silver, 968 l. 15 s. which in the Year comes to 353563 l. 15 s.

Afterias, Gallicia and Lusitania paid yearly 20000 Pondo of Gold, or 645833 l. 6 s. 8 d.

There was a Mine in Dalmatia which yielded per diem 50 Pondo of Gold, 1614 l. 11 s. 8 d. which in the Year comes to 589322 l. 18 s. 4 d.

The Macedonians paid yearly 2000 Talents; or 387500 l. as appears from 2 Macab. viii.

Strabo tells you that Britain bore heavy Taxes, especially the Customs on the Importation and Exportation of the Gallick Trade.

The greatness of the Roman Revenues does likewise appear from the vast Sums spent by the Emperors on Domains and Congiaria, which are mention'd before.

It appears that Nero spent that way 17760416 l.

What Vitellius spent I have mention'd before. Dio makes the Sum amount to 1853296 l. 13 s. 4 d.

Caligula spent within the Year 21796875 l.

Vespasian, at his Accession to the Empire, said, that to support the Commonwealth there was need of no less than Quadringerenties Millies, 322916668 l. 13 s. 4 d. which is a Sum so great, that it seems impossible to be raised in many Years out of the Taxes of the whole Empire.

The Roman Empire under Augustus maintain'd forty four Legions. Let us suppose these Legions full, consisting of 10 Cohortes, whereof the first was Millenia, a 1000 Men; the rest of 500 a-piece. According to this Computation the Legions will make 242000 Men, besides the Pretorian Bands and some Cavalry.

The Establishment of England in the Year 1711 was above

\[ \text{201000} \]
Tables of Ancient Coins,

201000 Men; and that of France was much greater than this of Augustus.

But one may say that this Force was too great for either Kingdom to exert, and could not be done without incurring an immense Debt.

C H A P. XIX.

Some Observations upon the Grecian Money Affairs.

THO' I have not leisure to make so long and particular a Dissertation upon the Riches and Money of Greece as I have done on those of Rome, yet to gratifie the Curiosity of the Reader, I have collected a few Matters of Fact, that will enable him to make some Judgment in what relation the Wealth of Greece stood to that of Rome.

The first Census of the Athenians, as it was instituted by Solon, was after the following manner,

Those of the first Class were called Pentacoshomedimmi, or, as the word imports, such as could afford 500 Medimni or Measures of dry or liquid things; I suppose as of Corn, Wine and Oyl. A Medimnus contains 4 Pec. 1 Gal. 1 Pin. 053 S. In. consequently 500 Medimni of Corn for Example make about 71 Qua. 2 Bush. 1 1/2 Peck.

Those of the second Class were termed Zeugite, from Yokes of Oxen and Horses.

Those of the third were called Hippai or Horsemen.

Those of the fourth were called Thotes, or such as dealt in Workmanship and Manufactures, these were excluded from any Share in the Magistracy.
Weights and Measures, &c.

The first Class was supposed to be able to make the Expences of a Talent, or 193 l. 15 s.
The Hippaei were supposed to be able to spend half a Talent, or 96 l. 17 s. 6 d.
The Zeugite were supposed to be able to spend 32 l. 5 s. 10 d.
The fourth Class were supposed not to be worth any thing, or incapable of making any publick Expences.
The Reader may see a full Account of this Census in the Authors mark'd at the Bottom of the Page*, the Passages are too long to transcribe.

* Corn was reckoned commonly at a Drachma the Medimmus, or 7 ½ d. per Quarter 4 s. 6 d.
  b In Demosthenes's time it was much higher, at 5 Drachms the Medimmus, which makes it per Quarter 1 l. 2 s. 7 ½ d.
  c There were indeed two of the greatest Dearths at Athens that ever were known in any Country. One in which the Price of Wheat came to 300 Drachms the Modius, per Quarter 305 l. 13 s. 9 d.
  d The other was when Athens was besieged by Sylla, when Corn was per Quarter 226 l. 8 s. 8 ½ d.
  e In times of Plenty the Price of a Sheep was 7 ½ d.
  f The Price of a Hog 1 s. 11 ½ d.
  g The Price of an Ox 3 s. 2 ½ d.

These Prices, which seem much upon a par with the early Rates of Cattle at Rome, must have been when Money was not in so great Plenty, for they keep no Ballance with the Price of Corn above mentioned; nor with the Price of a Horse which was 12 Mina, or 38 l. 15 s. But Horses came out of the East-country, and were at first scarce in Greece.

A Soldier's daily Pay was a Drachma, as a Denarius at Rome, 7 ¼ d.

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  lus lib. 8. a Plut. in Solone. b De-    e Plutarch. in Solone.
  mophenes contra Phormionem. Philippus lib.    f Aristophanes in Pace. g Plutarch. in
  a Chronic. c Plut. in Demetrio. h Aristophanes in Nebulis.
  i Demoth. Olynth. 1.
Tables of Ancient Coins,

There were some Soldiers called Didrachma, from having double that Sum, 1 s. 3; d. viz. the second Drachma for a Servant.

There is likewise mention'd by Xenophon a Tetrobolon, a Soldier's Pay, 5; d.

1 The Pay of a Horseman per Month, besides his Provisions was no more than 30 Drachms, (that is a Drachm a day) 19 s. 4; d.

The Greeks, especially the Athenians, were great Encouragers of Arts. The yearly Pay of a common School-master was a Mina or 3; l. 4 s. 7; d.

The same was the Reward of a Teacher of Dialektics.

* The Reward of a Sophist was 4 or 5 Mina, 12; l. 18 s. 4; d. or 16; l. 2 s. 11; d.

: Gorgias the Orator had from his Scholars 1000 Mina, or 322; l. 18 s. 4; d.

According to Suidas the Reward of the Sophists was a Talent, 193; l. 15; s.

* The yearly Pension paid Democedes the Physician by the Athenians was 100 Mina, or 322; l. 18 s. 4; d.

* The Aegineta paid him yearly the Pension of a Talent, or 193; l. 15; s.

* He had a Pension from Polycrates Samius of two Talents, 387; l. 10; s.

* Isocrates had from his Disciples a Didrachm, or Reward of 1000 Mina, 322; l. 3 s. 4; d.

* Pamphilus a Painter had from his Apprentices a Talent a year, 193; l. 15; s. and they were bound, it seems, for ten Years. But...reads it, Docuit neminem minoris talentis annuis quadraginta, and that from the Authority of an ancient Manuscript: But this Sum is incredible, being no less yearly than 7750 l.

* Isocrates had a Talent for inditing the Letters which Timotheus sent to Athens, or 193; l. 15; s.

When

Weights and Measures, &c.

*When Ameobaus the Harper sung in the Theatre at Athens, his Pay per diem was a Talent, 193 l. 15 s.

*Helcyon got from Dionysius a Talent, or 193 l. 15 s. because he had foretold an Eclipse of the Sun.

*Demosophenes sold the Silence of one Day for 20 Talents, or 3875 l. to Harpalus, and he was fined for it 50 Talents, 9687 l. 10 s.

*The Judges at Athens had 150 Talents, 2906 l. 10 s.

*The Rewards of the Isthmian and Olympick Games were but small, as they were instituted by Solon: The Honour of the Victory was the chief Encouragement. To the Victor in the Isthmian Games the Reward was only 100 Drachmae, or 3 l. 4 s. 7 d. To the Victor in the Olympick Games 500 Drachmae, or 16 l. 2 s. 11 d.

500 Drachmae in those early Days was thought a competent Fortune for a Gentlewoman, and was raised by Contribution by her Friends, 16 l. 2 s. 11 d.

*The Athenians gave 3000 Drachma, 96 l. 17 s. 2 d. to the two Daughters of Aristides, he himself being very poor.

Eminent Painters had great Prices for their Pictures; I took notice before, that *Aesopiodorus had paid him by Theomnestus for every Figure of a Hero 100 Mina, or 322 l. 18 s. 4 d.

*There were 100 Talents, 19375 l. of Tribute, remitted to the Curi for the Venus of Apelles.

*As to Books, I took notice before that a few Manuscripts of Philolaus were sold for 100 Mina, or 322 l. 18 s. 4 d.

*Ptolomy Philadelphus bought of the Athenians the original Manuscripts (or those perhaps which were given out to be such) for 15 Talents, or 2906 l. 15 s.

*Isocrates sold one Oration to Nicoles, King of Cyprus, for 20 Talents, 3875 l. which was the same Price that Demosthenes had for holding his Tongue.

All: 

* Plutarch. in Demosthene. * Plin. lib. 35. cap. 10. 
* Diog. Laert. lib. 3. Gall. lib. 3. cap. 17. 
* Aristoph. in Vespis. * Plut. in Solone. 
* Plut. in Socrates. * Philippus in Declamat. de studiis veteris Phil. 
* Suidas in Φίλο. * Plutarch in Aristide. 
* Plutar. in Socrates.
Tables of Ancient Coins.

All these Rewards came vastly short of what was paid Aristotle by Alexander for his natural History of Animals, being no less than 800 Talents, or 155,000 l.

The Punishments of free Governments are commonly gentle, accordingly the legal Fines are commonly but small; 100 Drachma, 3 l. 4 s. 7 d. was the common Fine for a Rape appointed by Solon.

The Fine of a Slanderer, or one that betrayed Secrets, was 500 Drachma, 16 l. 2 s. 11 d.

But great Men who mis-served their Country, were often fined very highly; as Pericles, who was fined 50 Talents, 9687 l. 10 s.

Miltiades was fined the same Sum.

And Demades paid ten Myriads of Drachms, or 3229 l. 3 s. 4 d. for a hundred Strangers who danced at Athens against Law.

It was a pretty large Fine that was imposed by Cassius on Rhodes, no less than 500 Talents, or 96875 l.

But nothing ever came up to the Extravagance of the Expenses of the Funeral of Hephaestion by Alexander, being no less than 12000 Talents, or 22,25000 l.

Plutarch makes this only 10000 Talents, or 193,7500 l.

Indeed one must own he had plentiful Sources of Riches and Treasure for such Expenses. The Crowns that were sent him in Presents at his Marriage were reckoned worth 15,000 Talents, or 2906250 l. Curtius affirms that at Susa and Persopolis he got no less than 150000 Talents, or 29062500 l.

He found in the House of Bagoas wearing Apparel to the Value of 1000 Talents, or 193750 l.

The Riches of Damascus only in coined Money was 50,3750 l.
Weights and Measures, &c.

The Foot-stool of Darius was valued at 3000 Talents, or 581250 l.

After such an immense Value for a Foot-stool, one must not wonder at the Price of the Scabbard of Mithridates's Sword, which one Publius having stole, sold to Ariarathes for 400 Talents, 77500 l.

His father Philip's Revenues were very inconsiderable in respect of such Sums. Diodorus Siculus reckons as a prodigious Sum the thousand Talents that were yearly paid to Philip, 193750 l.

And Herodotus makes the three Governments of Asia pay yearly only 1470 Talents, 284812 l. 10s.

As Alexander received great Sums, he was no less generous and liberal in disbursing of them; and it may gratify the Curiosity of the Reader to give some Account of them, that he may compare them with the Liberality of the Roman Emperors.

At one time he gave to each of his Soldiers 96 l. 17 s. 6 d.

He discharged 900 Soldiers by reason of their Age, and to every Foot Soldier of them he gave 96 l. 17 s. 6 d. and to every Horseman 397 l. 10 s.

He gave a Donative to each of the foreign Horsemen in his Service of 500 Denarii, or 16 l. 2 s. 11 d.

He gave to the Macedonian Horse, 19 l. 7 s. 6 d.

To the Soldiers who were to return to their own Country, he ordered per man 32 l. 5 s. 10 d.

And at another time he gave to each Soldier who returned home, 96 l. 17 s. 6 d.

At one time he gave to each Horseman, 193 l. 15 s.

He gave likewise 2000 Talents, 387500 l. as a free Gift to the Thessalians. And after all he left in his Treasure at his Death 100000 Talents, 1937500 l. No wonder, since his yearly Tribute, as the same Author hath delivered it, was 300000 Talents, 58125000 l.

D d

You

1 Athenæus lib. 12.  a Plut. in Pompeio. b Idem ibid. c Idem. lib. 6. d Plut. 
2 In Philippi anno 3. e Herodot. lib. 3. in Alexandro. e Justin. lib. 13.  
* Curt. lib. 7.  a Idem lib. 5.
Tables of Ancient Coins,

You have all those Sums as they are delivered by the Authors, whose Credit must answer for them.

The Romans could never be said to be rich before their Conquest of Greece. Greece was much richer than Italy, and Asia than Greece. The Revenues of the Athenian Commonwealth were vastly greater than those of Rome, considering the small Extent of their Dominions; for the Athenian Dominions were always very small, the Romans very early had acquired a much larger Territory, and yet were very poor. This will appear from the following Account of the Athenian Revenues.

Demosthenes tells you, that the Revenue of Athens in early times was 130 Talents, 25187 l. 10s.

That it had received an Addition of 400, or 77500 l. which makes in all 102687 l. 10s.

Xenophon calculates the Revenue at 1000 Talents, or 193750 l.

According to Aristophanes, it was 2000 Talents, or 387500 l.

Thucydides brings in Pericles speaking of their Wealth, and reckoning the yearly Tribute of their Confederates 600 Talents, 116250 l.

Demetrius Phalareus, when he was at the Head of their Affairs, had in his Power a Revenue of 1200 Talents, or 232500 l.

Thucydides affirms that there were in the Castle at one time 6000 Talents, 1162500 l.

Isocrates states that Pericles brought into the Castle 8000 Talents, 1550000 l.

Lysias, Son of Lycophron, brought into the Treasury more than 6500 Talents, 1259375 l.

They were able to undertake very great Works, and laid out on the Castle 2012 Talents, 400235 l.

The Attick Dominions upon the Continent were scarce so big as Yorkshire: What a Figure did this Republic make in the World with so small a Dominion!

The
Weights and Measures, &c.

The Macedonians, who had a much larger Dominion, did not, after they were subdued, pay above 100 Talents Tribute to the Romans, 19375 l.

I shall conclude this Chapter with one Instance of the Asiatick Riches, the Credit of which Story I leave the Authors to answer for. It is the Value of the Treasure of Sardanapalus, with which he made a Funeral Pile for himself and Family, when he was besieged by Arbaces, King of the Medes. Arthenaeus makes the Value of the Treasure of this Pile to amount to 100,000,000 Talents, which reckoned in Babylonick Talents, amounts to 1695 3r 12 5000 l.

This was only the Value of the Silver; there was besides a tenth part of that Number of Talents of Gold, which, if Gold was reckoned in a decuple Proportion, will just double the Sum.

CHAP. XX.

Some Examples of the Application of the Tables relating to the Money-Affairs of the Jews.

When Saul and his Servant went to consult Samuel about finding their loft Asses, they designed to have given him the fourth part of a Shekel, 7 2/3 d.

Jeremiah bought Hanameel's Field for 17 Shekels, 2 l. 3 s. 11 d.

David gave unto Araunah for his threshing Floor and Oxen 50 Shekels, 6 l. 9 s. 2 d.

The same is related differently in another Place, where it is said that David gave unto Ornan for the Place 600 Shekels of Gold, 1240 l.

Omer, King of Israel, bought the Hill Samaria for two Talents, 387 l. 10 s.

The

a 1 Sam. ix.  b Jer. xxxii.  c 2 Sam. xxiv.  d 1 Chron. xxii.  e 2 Kings xvi.
Tables of Ancient Coins,

The Estimation of a Male from twenty Years old to sixty is 30 Shekels, 6 l. 9 s. 2 d. If it be a Female, the Estimation is 30 Shekels, 3 l. 17 s. 6 d. If it be a Male from five Years old to twenty, the Estimation is twenty Shekels, 2 l. 11 s. 8 d. And if a Female 10 Shekels, 1 l. 5 s. 10 d. If it be a Male from a Month to five Years old, the Estimation is 5 Shekels, 12 s. 11 d. And if a Female 3 Shekels, 7 s. 9 d. If it be sixty Years old or upwards, the Estimation of a Male is 15 Shekels, 1 l. 18 s. 9 d. And that of a Female 10 Shekels, 1 l. 5 s. 10 d.

If a Man shall sanctify unto the Lord some part of a Field, the Estimation shall be according to the Seed, an Homer of Barley (1 Quart. 3 Bush.) shall be valued at 50 Shekels, 6 l. 9 s. 2 d.

The First-born was redeemed for five Shekels, 12 s. 11 d.

When the Children of Israel were numbered, each above twenty Years old was obliged to pay half a Shekel; 1 s. 3 ½ d. and their Number was 603,550, so that the Sum came in all to 389,791 l. 5 s. 5 d.

When Ben-hadad, King of Syria, besieged Samaria, an Ass's Head was sold for 80 Pieces of Silver, 10 l. 8 s. 8 d. and the fourth part of a Cab. (i.e. about a Pint) of Doves Dung for five Pieces, 12 s. 11 d.

Micah gave unto his Priest, besides Victuals and Cloaths, ten Shekels of Silver yearly, that is 1 l. 5 s. 10 d.

Hosea bought a Woman for fifteen Pieces of Silver, 1 l. 8 s. 9 d. and an Homer and an half of Barley, which is more than two Quarters.

Joseph's Brothers sold him for twenty Pieces of Silver, 2 l. 11 s. 8 d.

If an Ox puth one, his Owner was obliged to pay thirty Shekels of Silver, 3 l. 17 s. 6 d.

If a Man committed a Rape, he was obliged to marry the Woman, and pay her Father fifty Shekels, 6 l. 9 s. 2 d.

Abraham's

[Notes and references at the bottom of the page]

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Weights and Measures, &c.

Abraham's Servant made a present to Rebeccah of an Ear-ring of Gold weighing half a Shekel, 1 l. 8 s. and of golden Bracelets weighing ten Shekels, 20 l. 13 s. 4 d.

The Crown of Haman, King of the Ammonites, weighed a Talent of Gold, or 130 lib. Troy, and so was worth 6200 l.

Pharaoh-necho, King of Egypt, during the Reign of Jehoahaz, imposed on the Jews a Tribute of 100 Talents of Silver, 38750 l. and one of Gold, 6200 l. which make together, 44950 l.

Menahem gave to Pul 1000 Talents of Silver, 387500 l. to confirm the Kingdom in his Hands. And he raised the Money by exacting from each of the richer sort of the Jews fifty Shekels, 6 l. 9 s. 2 d.

When Sennacherib, King of Assyria, invaded Judah, he was prevail'd on to return home for the Sum of 300 Talents of Silver, 116250 l. and 30 of Gold, 186000 l. in all 302250 l.

And Hezekiah, King of Judah, to raise this Sum, was obliged not only to advance all his own Treasure, but likewise to take the Plate out of the Temple.

When Amnon, King of the Ammonites was going to make War upon David, he sent 1000 Talents (387500 l.) into Mesopotamia to hire Chariots and Horsemen.

Amaaziah, King of Judah, hired 10000 Men for 100 Talents, 38750 l.

After Joatham, King of Judah, overcame the Ammonites, he made them pay three Years successively 100 Talents, 38750 l. 10000 Measures of Wheat and as many of Barley.

Haman offered to pay 10000 Talents of Silver (3875000 l.) to King Ahasuerus upon condition he would give Orders to destroy the Jews. But Josephus (lib. 2.) tells us that he offered four Myriads of Talents, which, if they be Attick, amount to 7750000 l.

Artax...
Tables of Ancient Coins,

"Artaxerxes, King of Persia, ordered to be paid to Ezra the Priest whenever he should demand, as far as 100 Talents of Silver, 38750 l, 100 Measures of Wheat, 100 Baths of Wine, and 100 Baths of Oyl.

Ezraiah committed to the Custody of the Priests 550 Talents of Silver, 251873 l, 100 Talents of Silver Vessels, 38750 l, 100 Talents of Gold, 620000 l, and two Barons of Gold of 100 Drachmas, 31 l, 13 s. 4 d., which all together amount to 910576 l, 13 s. 4 d.

Darius ordered 39 Talents, or 7356 l, 5 s. to be paid the Jews yearly towards the building of the Temple, and defraying the Charge of the Burnt Offering.

Simon the High-priest sent Ambassadors to the Romans to renew their old Friendship, and with them a golden Shield weighing 1000 Pounds.

Antiochus demanded of the Jews the Cities of Tyre and Caroea, or in the place of them 500 Talents, 96875 l. And for the Harm they had done, and for the Tributes of the Cities he demanded 500 Talents more. But Simon the High-priest offered him only 100 Talents, 19375 l.

Jason, to be made High-priest, offered to give Antiochus 380 Talents of Silver, 69750 l. and out of a certain Revenue 80 Talents more 15500 l, and 150 Talents, 22062 l, 10 s. upon condition that he should get leave to train up the Youth in the Fashions of the Heathen, and call the Inhabitants of Jerusalem by the Name of Antiochiuns, which three Sums amount to 114912 l, 10 s.

But Menelaus being sent to Antiochus with the Money, offered 500 Talents more, 58125 l. and so got the Priesthood to himself.

Simon the High-priest sent 100 Talents, 19375 l. to Tryphoan; that he might set his Brother Jonathan at liberty.

Heli-
Weights and Measures, &c.

1 Héliodore, Treasurer of Seleucus, carried out of Jerusalem 400 Talents of Silver, 775.00 l. and 100 of Gold, 620.000 l., which had been laid up for the Relief of Widows and Orphans. Both Sums make 695.500 l.

1 When Antiochus conquered the Jews, he carried out of the Temple 1,800 Talents of Silver, 5,487.50 l.

2 Nicanor undertook to raise 2,000 Talents, 3875.00 l., by selling the Captive Jews, 50 for a Talent.

C H A P. XXI.

Of the Cost of the Temple, and the Riches of David and Solomon.

The Furniture of the Table of Shew-bread, the Candlestick and other Instruments were made of Gold, and weighed a Talent, 620.00 l.

b There was laid out for the Altar of Burnt-offering, 29 Talents and 730 Shekels of Gold, 181.308 l. 13 s. 4 d. 100 Talents and 1775 Shekels of Silver, 196.04 l. 5 s. 5 d. and 70 Talents 2400 Shekels of Brass.

c The most holy House was overlaid with fine Gold, amounting to 600 Talents, 3,720.000 l.

d David laid up of his own Money for building the Temple 3000 Talents of Gold, 186.000.00 l. and 7000 of Silver, 2,712.50 l. The Princes of the Tribes gave towards it 5000 Talents and 10000 Drachms of Gold 31,0005.16 l. 13 s. 4 d. 10000 Talents of Silver, 3,875.000 l. 18000 Talents of Brass, 100000 Talents of Iron.

David

1 2 Macab. iii. 2 Macab. v. Exod. xxxiii. 2 Chron. iii. 2 Macab. viii. Exod. xxv. & xxxvii. 1 Chron. xxix.
Tables of Ancient Coins,

David prepared in all for the Temple 100000 Talents of Gold, 620,00000 l. and 1000000 Talents of Silver, 193.750000 l.

Hiram King of Tyre gave unto Solomon 120 Talents of Gold, 744000 l.

The Queen of Sheba gave him the same.

Solomon's Fleet brought from Ophir 420 Talents of Gold, 2694000 l.

Solomon in one year received 666 Talents of Gold, 4029200 l. besides what he got from the Merchants, the Governors of the Country, and the Kings of Arabia.

In these Computations the Shekel is supposed quadruple of the Drachma, according to Josephus. And the proportion of Gold to Silver is sixteen to one. The Talents in passages of the Old Testament are stated double the Attick, but in passages out of the Apocrypha the Attick Talent is used.

C H A P. XXII.

Of the Interest of Money.

It is natural to ask, if Money was in such Plenty in Rome and Athens, how came Interest to be so high?

To make a compleat Dissertation upon the Interest of Money among the Ancients, would require a Volume larger than all this Treatise. But the Reader may take the following Account of it, as far as it coincides with my Design. The most ancient word for Interest was Fanus, which some derive from powos, pretium vel pena; some from an obsolete Word feo, from whence fatus and succundus. Usura, which was a general word, signifying the use of any thing, (Plaut. Prolog. Amphitr. Usuram corporis ejus capit sibi,) came afterwards to be applied to Money.
Weights and Measures, &c.

Interest for Money was forbid amongst the Jews, and by an old Law in Rome (call'd the "Lex Gerundia") likewise amongst the Romans. But neither Romans nor Jews were forbid to take Interest from Strangers: but afterwards this Law came to be abolished, or grew insignificant, as most Laws will that limit the price of Money, contrary to the natural course of it. The Interest of Money, both in Rome and Greece, was high for a considerable time. Simple Interest was exacted monthly in both places at the rate of one per Cent. per Month. In Greece at the New Moon, and in Rome at the Kalends. "Kalendarium exercere" signifi'd the same thing with "fœnus exercere." Therefore Strefiades, in Aristophanes, being burden'd with Debt, dreaded "envy & vex." This Usury was a Drachma upon the Centum Mima, somewhat more than twelve per Cent. a year, because the Lunations returned oftener than our Kalendar Months. The Romans paid likewise a Denarius a Month for 100 Denarii: and it is mention'd by Cicero as monthly. Achilles in his Oration Ctesphon, saith that the Oristani paid him a Drachm a month till the principal was repaid: this was called "exercitium" or centesima usura, one per Cent. And because the As was reckoned any Integer, it was likewise called Asses usura: so that Asses usura and centesima usura are the same thing. The other Subdivisions of Interest according to the parts of the As one may see in the Tables. Livy and Tacitus mention the "fœnus unciarium" and semiumciarium as high, which according to the proportion of the As, being but ⅜ or ⅝ in the Month, must only make ⅓ or ⅜ per Cent. per annum. And the Law of the XII Tables forbids, "ne quis unciario "fœnere amplius exerceto." So it is express by Tacitus. These Expressions cannot be interpreted according to the Analogy of the Tables, but differ from all the others, and they certainly denote the centesima usura: but how this way of Expression in these two Authors has happened, I can give no Account: It seems they put the Uncia for the As or Integer.

The Centesima Usura was the greatest Interest, which it was not lawful to exceed; and what was paid over it, was reckoned as a Repayment of part of the Principal. But whatever Laws were made

Plin. lib. 35. cap. 7. Seneca de Beneficiis lib. 7. Lib. 3. Epist. ut.
Tables of Ancient Coins,

to regulate Interest, it was in Rome as in all other places, the Value of Money rose above or fell below the legal Interest, according to the Scarcity or Plenty of the Commodity. So that Semisses Ufura or ½ per Cent. per month, six per Cent. a year, which Pliny calls Civili et modico, came to be the publick and customary Interest of Money; for the Asses Ufura came to be a grievance, and occasion'd great tumults among the people: yet still he that took it was not reckoned to transgress any Law; and there were some greedy Ufurers that exacted double, triple, nay four times as much.

The Sesquicentesima, which was 1½ per Cent., a month, and 18 per Cent. a year, was condemned by the Nicene Council. It was allowed by the Athenians only in the case of the Repudiation of a Wife, in which case the Husband was obliged to pay nine Oboli monthly, till the repayment of her Portion; nine Oboli make a Drachm and a half.

Cicero, in his Frumentaria, accuses Porres for lending out the Money that was instrued to him for buying of Grain, at 2 per Cent. a month; which shews that they must have been as great Exortioners as our Pawn-brokers.

There were no laws at first to limit the Interest upon Decemna Trajellitia, or Remus Nautium, the Money that was lent to Masters of Ships upon Bottom Money or their Goods. Yet even this was reduced by Justinian the Emperor from 2 to 1 per Cent., a month. The reason of the high rate of the Remus Nautium was the greater risk that the Creditors were suppos'd to run.

Money came to be so plentiful in Augustus Caesar's time, that it fell from Centesima to Ufura trivaria; and Justinian reduced Interest to that rate, viz. to 4 per Cent. a year. There was also Quadrantes Ufura or ½ a month, or 3 per Cent. a year.

There was, besides simple Interest, a sort of compound Interest, which, as we observed before, was called by Tully Anteorsumus: it was sometimes reckoned after 100 months, and sometimes

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Weights and Measures, &c.

verily. Aristophanes calls it τόκος τιξόων. The reason of the Law was that the Creditor could demand his Money and Interest at the Term of Payment; but this came much to the same thing; for Debtors that were not very able to pay, submitted to add the Interest to the Principal for the sake of Forbearance.

There was an Interest allowed among the Romans for what they called the Species Crediti, as Corn, Wine, Oil, &c. which was settled by Constantine at a third part, that is, where two Modii were lent, the Debtor was obliged to pay three, in case no other Bargain was made. The reason of this was the Variableness of the price of those Commodities.

A monthly Interest is higher than an annual one of the same rate, because it operates by compound interest. This suggests to me the following Problem.

The rate of Interest per annum being given, to find the greatest Sum which is to be made of one Pound, supposing the Interest payable every indivisible moment of time.

Let r be the Interest of one Pound per annum, and let t denote any part of time with respect to the whole Year: the simple Interest due for that time will be rt. Now if the Interest be payable at the end of every such time equal to t, the whole Sum at the end of the year, reckoning compound Interest, will amount to \(1 + rt\). But by Newton's Theorem we have

\[
\frac{1 + rt^2}{1 + r} = 1 + rt + \frac{r^2}{2} + \frac{r^3}{3} + \ldots + \frac{r^t}{t} + \frac{r^{t+1}}{t+1} + \frac{r^{t+2}}{t+2} + \ldots + \frac{r^{t+n}}{t+n} \]

And by supposition t denotes an indivisible Moment of time, and therefore it is equal to nothing: in which case the former Value of \(1 + rt\) becomes

\[
1 + r + \frac{r^2}{2} + \frac{r^3}{3} + \ldots + \frac{r^t}{t} + \frac{r^{t+1}}{t+1} + \ldots + \frac{r^{t+n}}{t+n}
\]

For
Tables of Ancient Coins,

For instance, suppose one Pound pay every Moment at the rate of 6 per Cent. per annum, then is \( r = 0.06 \); which substituted in the Series gives the Terms as in the Margin, whose Sum is 1.06183654 equal to the Value of 1 Pound with its Interest at the End of the Year. And as 1 is to this Number, so is any other Sum let out to Interest, to that Sum which it amounts to at the End of the Year. For if the Sum let out be 10,000,000., it will be found to amount to 10.6183654 l.; that is 10.618365 l. 8 s.

This Problem is likewise solved by a Table of Logarithms, as follows.

Multiply \( r \) into 43429448... &c. viz. the Reciprocal of the Hyperbolick Logarithm of 10; and the Product will be the Logarithm of the Number required, which will be found by the common Tables.

High rates of Interest are an Indication of the Scarcity of Money; but this Reason will not operate so strongly in the case of the Roman Citizens, as it would in other Cities of Europe at this Day.

For,

1. It is plain there was a great deal of Credit at Rome, where great Men could run in debt such vast Sums, as appear in the Chapter of Debts and Estates, even as far as half a Million without any other visible Fund but their personal Merit, and hopes of preferment in the Commonwealth.

2. The Usurers or Money-changers being a sort of a scandalous employment at Rome, is another reason for the high rate of Interest. For where a Trade or Profession is exercised clandestinely, and not in a legal manner, it must be exercised with more Fraud and Extortion; and indeed those money Scriveners seem to have been little better than our Pawn-brokers.

3. The Romans do not seem to have known the secret of Paper Credit, and Securities upon Mortgages, as far as I know, or at least to the degree it is practised now-a-days, which makes as it were a Multiplication of the Species of Money.
Weights and Measures, &c.

4. The Ambitus was the great Trade of Rome, and demanded a constant Supply of great Sums of Money. *Tully assigns this reason for the high rate of Interest, and tells us that it had brought it from 4 per Cent. to 8. Bribery was come to the height of 80729 l. per Tribe, at the least the Majority of them, such as had the casting Votes. And there being no less than thirty five Tribes, it is easy to guess how expensive this Corruption was grown, and every body knows where it ended at last. This hath been hinted in a former Chapter.

*Cicero Epist. 2. ad Q. Fratrem. Ambitus in prærogatifum pronunciare. —— Ardet sed it immannis, nunquam suit par, non dico Ambitus fecus ex triente, Idibus Quinque lis faci hyperbolas, vel Sesterium Centes constituentes est belli bus.
A Dissertation
Concerning the Navigation of the Ancients.

The Consideration of the Riches of the Ancients leads us naturally to that of their Trade; and there it is no less obvious to enquire into the Bulk and Tunage of their Shipping: but I imagin'd that Calculations of this kind would seem dry and incoherent without a general Discourse on the Subject to which they related. I chose therefore to compile a compendious History of the Navigation of the Ancients, having the Assistance of the learned M. Huet's Treaty on their Commerce. The nature of my Undertaking confined me to Brevity in this, as in the other Dissertations; and yet I believe there are very few material things omitted.

Ships were at first called Rates in the Roman Language from their Texture, Ex ratibus vimine contextis. The Ancients, faith Isodorus, join'd together pieces of Timber, and covered them with Planks, which were their first Ships. If we had not improv'd the Inventions of our Predecessors, faith Quintilian, we should be still failing in Ratibus, in Rafts or Floats. The Monoxyla or Boats made of one hollowed piece of Timber, were still an improvement.

Isidor. 19. 1.  & Quint. 10. 2.
Weights and Measures, &c.

ment the upon Rates. They were used in very early times, and particularly by the Indians in opposing the Invasion of Seminamis.

Xenophon mentions them as capable of holding only three Men.

Polyemer as carrying only one; they are used in Greece at this Day. M. Spence tells us in his Book of Travels, that he was carried in one; he adds that they were fifteen or twenty feet long, a foot and a half broad, and as much in depth; that he saw two Houses carried over in one of them. According to what is mention’d by Sidonius Apollinaris:

— Pars lintre cavata.

Sarn dociles exponit equos.

*Pliny says, that German Pyrates used them, some being capacious enough to carry thirty Men. They were in use among the Gauls, as Livy relates; and among the Spanish, according to Strabo. They were called by the Romans Arvei.

There were likewise Boats covered with Leather, us’d particularly by the Britons. Carina primum, faith Caesar, at statumina ex levis matereia sunt, reliquum corpus vinnibus contextum coriis integratur. These were called by the Greeks Aegaeatai, particularly by Xiphilinus: they are used in Wales, and amongst the Tartars, at this Day.

The most brittle Water-carriage was used among the Egyptians, who, as Strabo saith, would fail sometimes in Boats made of Earthen-ware.

— Imbelli & inutile vulgus.

Pareulx fictilibus solitum dare vela faselis,


The Egyptians made Boats of the Papyrus, a Plant of which writing paper was made till the ninth or tenth Age; and from whence it still retains its Name.

Plutarch


* Lib. 17.
Plutarch relates it as a common opinion, that Crocodiles would not hurt such as were carry'd in those Paper Boats, because Isis once sail'd in one of them.

What appears still more incredible, the Indians made Boats of hollow Canes. * Heliodorus faith they split a Cane in two, and made a Boat of each part. 1 Pliny tells you they were big enough to carry three Men.

The common Materials which the Ancients made their Ships of, were the Ornus, or the wild Ash; the Ilex, or ever-green Oak; the Beech; and the Alder. The Fir was likewise uled for this purpose, Lucan lib. 3.

Occumbunt Orni, nodosa impellitur Ilex,
Silvaque Dodones, & fluctibus aptior Alnus.

m Pliny tells us that in Egypt and Syria the Kings were forced to build their Ships of Cedar for want of Fir.

The Romans made use of Fir, with which their Forests supply'd them plentifully.

* Ptolomy promised the Rhodians Timber for building of ten Quinquiremes, and as many Triremes, and some of forty Cubits long.

They joined their Timbers with Iron. Vegetius faith that such as would be at the Expence used Brass, because it did not rust. Hiero made use of that Metal in the building of his great Ship. They filled up the Interstices of their Planks with Hemp and Pitch; and sometimes with a sort of Juncus or Ruth called Spartum.

We shall have occasion to discourse of the Bulk of their Vessels, and the different sorts of them, in the following part of this short History.

It is probable that, even before the Deluge, Mankind, who had attained to great Perfection in other Arts, must have used some sort of Machines, made of the Materials above mentioned, to pass Rivers and Gulphs for the conveniency of mutual intercourse.

After

k Heliod. 10. 27. 1 Plin. lib. 8. m 16. 41. n Polybius lib. 5.
Weights and Measures, &c.

After the Deluge the condition of mankind made this commerce more necessary, and the Islands could not be peopled without Transport by Shipping. The Egyptians and Phenicians were undoubtedly the first People who cultivated the Art of Navigation.

The Egyptians at first navigated the Red Sea by the permission of the Idumeans who were Masters of it. (It is believed the Idumean King Erythras was the same with Edom or Esau.) But the Egyptians soon emancipated themselves from that dependance.

Osiris, or, as the Greeks call him, Dionysus, the Bacchus of the Ancients, is reported to have civilized the Indians and reigned amongst them 52 Years, planting Colonies and building Cities, A.M. 2422. upon which Setothis or Seothris, King of Egypt, founded his pretensions to the Indies, and after having conquered the Ethiopians, with a Navy of four hundred Ships sent into the Red Sea, subdued all the maritime coasts as far as India; he himself in the mean while extending his Conquests, by Land, farther than Alexander did, beyond the Ganges, and as far as the Ocean. This Correspondence between the Egyptians and Indians continued for many Years, insomuch that when Cambyses invaded Egypt, the Indians were the Refuge of many of the Egyptians. The learned M. Huet is of opinion, that the conformity of the Customs and Manners of the two Nations is a Token of this ancient Alliance. Particularly, the Chinese making use of Hieroglyphicks as the Egyptians do, their holding the Doctrine of the Metempsychosis, their Worship of a Cow, and their Aversion from receiving foreign Merchants into their Country, which, as Strabo relates, was the Temper of the ancient Egyptians.

The Indians were not ignorant of Navigation before the Invasion of the Egyptians; for, perhaps an hundred years before the Expedition of Seothris, according to the imperfect Chronology of that time, they maintained a War against Semiramis, in which they had four thousand Monoxyla or Canoes of one piece of Timber, on the River Indus; such a People must have had some Experience of Navigation upon the Ocean.
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It plainly appears that the Aegyptians practiced this Navigation very early; therefore when Strabo tells us that Ptolemy Philadelphus was the first who opened the Navigation of Aegypt to the Indies, it must be understood of the Princes of Greek Extraction; for during the Empire of the Persians, who had no occasion for the Aegyptian Ports to carry on their Indian Trade, the Commerce of the Aegyptians with the Indies had been so much interrupted, that the Indian Seas were believed to be un navigable.

The Phenicians were, next to the Aegyptians, the most ancient Navigators; they inhabited the maritime Coasts of Syria, bordering on Palestine: their Country is properly called Phenice, not Phenicia; Phenicoen illustravere Phenices, faith Pomponius Mela, solvers hominum genus, & ad belli pacisque munia eximium, literas, & litterarum operas, aliasque etiam artes, maria navibus adire, classe configere, imperitare gentibus, regnum praeliumque commenti; a great Character indeed, to be skilled in Arts and Sciences, addicted to Navigation and Commerce, powerful and valiant to maintain the Empire of the Seas.

The Commerce of the Phenicians lying more towards the West than that of the Aegyptians, was the occasion of their being celebrated by ancient Authors as the Inventors of Astronomy and Navigation. When Pliny names the Euni as Inventors of Navigation, it must not be understood of the Carthaginians, but of the Phenicians, from whom the Carthaginians were descended. They navigated into the Ocean by the Straits of Gibraltar, established many Colonies; Thebes in Baetia, Cadiz, and Carthage itself, which was built fifty Years before the Destruction of Troy. It was under the Conduct of the Phenicians that Solomon's Fleets sailed to Ophir and Tharsis from the Ports of Ailath and Esongaber on the Red Sea. Ophir was the general name of the Eastern coast of Africa, and Tharsis that of the Western coast both of Africa and Spain. This Commerce Jehosaphat, King of Judah, endeavoured to renew, but his Enterprise was blasted by the Destruction of his Vessels in the Harbour. The Character which Josephus (in his Book against
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against Appion) gives his Countrymen is pretty true; that being a Mediterranean People, they contented themselves with Husbandry, and did not meddle with Trade; accordingly the Jews manned their Ships with the Inhabitants of the maritime Ports of the Country, of which they possessed chiefly the inland places. Joppa is the most famous Port mentioned in the Scriptures. It is past doubt that the Cape of Good Hope was doubled in those early times; and that the Portuguese were not the first Discoverers of that Navigation.

The Phoenicians, of all the Ancients, resembled most the Dutch, their Country being narrow, low and boggy, and by great Industry and Experience defended from the Sea. Those inconveniences were ballanced by the Number and Goodness of their Harbours, amongst which the chief was antient Tyre, at first built upon the Continent, and fortified so well, that it was able to repel the great Army of Salmanazar, and suffer thirteen Years Siege by that of Nebuchadnezzar, the Hardships of which induced the Inhabitants afterwards to transport themselves and their effects into a neighbourling Island, where they built a new Tyre, far surpassing the other in Splendor and Wealth. This Tyre continued until the time of Alexander the Great, who took it and sack'd it after a most barbarous manner, and by establishing the Staple at Alexandria in Egypt, made one of the greatest Revolutions in Trade that ever was known.

The Greeks, in their Lists of such as have been Masters of the Mediterranean, give the seventh place to the Phoenicians, and the eighth to the Egyptians; but they were always reproached by the Egyptians as Novices in Antiquity. For the Phoenicians were much older Sailors than the Greeks: the naval Expedition of their Hercules mentioned by Sanchoniathon under the Name of Maltanthes, being three hundred Years before that of Jason.

Persia is commodiously situated for Trade both by Sea and Land; it has on the South side of it the Indian and Arabian Seas, and Persian Gulph; towards the North the Caspian and Euxine; besides the

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the Advantage of great navigable Rivers, such as the Euphrates and Tigris: notwithstanding all which natural Conveniences they never discovered any great genius for Trade and Navigation. *Susa-miramin, who reign’d in that Country, made a great Figure at Sea, and was supposed to have invented Gallies, of which she is reported to have had no less at a time than three thousand with brazen Rostra; but her Fleet was not man’d with the Natives of the Country. *Sakmanasar, one of her Successors, man’d his Fleet with his Phænician Subjects, but it was so ill conducted, that the Tyrians destroy’d it with less than ten Ships. The Fleets which Darius and Xerxes* rigged out against the Athenians, were built and man’d by their Tributaries and Allies, who dwelt in the Coasts and Islands of the Mediterranean: We have a List of Xerxes’s Fleet* consisting of 1107 Triremes, transmitted to us by such as wrote the History of that War, Phænicians and Syrian Ships 300, Egyptian 100, Cyprian 150, Cilician 100, Pamphylian 30, Lycian 50, Carian 70, Ionian 70, Islanders 17, Aeolian 60, Halieปลerian 100; besides these there were lesser Ships of thirty and fifty Oars, furnished by the Cimmerians and Hippagrians, which made up the Number. In all this List there is no mention made of the Persians.

After the Victory that Cinus* the Athenian Admiral obtained over the Fleet of *Assaxerxes Longimanus, the Persians had renounced all Pretensions to the Grecian Seas, obliging themselves not to approach them within three days sail; nor to send any man of war into the Lycian Sea (on the Coast of Asia Minor over against Rhodes) or Pamphylian Sea (between the Continent and Cyprus) towards the South; or the Euxine Sea towards the North. Nothing could be a greater indication of a genius quite opposite to naval Skill and Commerce than such an unsuccessful War and dishonourable Treaty, unless it was their interrupting the Navigation of their great Rivers, Euphrates and Tigris, by Cataracts, to hinder the Invasion of foreign Nations. *Strabo takes notice of them, telling us, that before they were made, the Tigris was navigable as far as the

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the Ground where Seleucia afterwards stood, and the Euphrates as far as Babylon. Alexander, conformably to his usual genius, broke down those Cascades, and opened the Navigation of the Rivers; but in process of time the same vile spirit prevailed, and they were set up, and subsisted in the time of the Emperor Justinian. They were since demolished a second time, and a great Trade carried on by the Rivers, the most famous Staples of which were Siraf on the Persian Gulf, and Omana, of which Pliny speaks as a Place of great Trade, and different from a City of the same Name in Arabia.

Alexander made himself Master of the Indian Sea, and destroyed the Fleet which he had on the Mediterranean, to take from his Soldiers the Hopes of a Retreat, or rather to save charges; but to shew how little he considered the Sea-craft of the Persians, he employed none of that Country in his Fleet, but manned it with Carians, Phoenicians and Cyprians. His great Projects calling him elsewhere, he gave Charge of a naval Expedition to Nearchus, who sail'd out by the Indus, and returned to Persia by the Pastygris. The Successors of Alexander, Ptolomy Philadelphus, Antigonus and Seleucus signaliz'd themselves as much at Sea as at Land, of whose naval forces we shall speak afterwards. No Persian Monarch ever made a greater Figure at Sea than Mithridates, who disputed the Empire of the Mediterranean with the Romans, made himself Master of it from the Cilician to the Ionian Sea; and to repulse the Roman naval Power, and interrupt their Trade, sail'd the whole Mediterranean with Pyrates as far as the Straits of Gibraltar.

Tho' the Persians had no great genius for Traffick by Sea, they had a very great Commerce by Land; and the antient Arsacia, the Seat of some of the Persian Kings, the fame with the present Caspian, grew potent and very rich by its inland Trade. The Caspian and Euxine Seas furnished the Armenians with the Goods which they carried.

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b This was the Seleucia, Parthorum in Mesopotamia, not far distant from Babylon, as the Confluence of the Tygris and Euphrates.

c Bagdat does not stand where ancient Babylon was; for it is seated upon the Tygris, whereas Babylon was upon the Euphrates. Babylon is now called Caldar.

d Ammian Marcellin. lib. 24.

e Lib. 36. cap. 28.

f The lower part of the Tygris.

g All the Sea between Sicily, Italy and Greece is called the Ionian Sea, of which the Adriatick, speaking properly, is but a part.
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carried into Persia; and the Trade of China and India: they de-
scended into the Caspian Sea by the Oxus, and remounted again
by the Cyrus, near the Euxine, from whence they were transported
to the European Countries: Paul Centurion a Genoese endeavoured to
recover that Trade in the time of Pope Leo X. and proposed to
Basil, Czar of Muscovy, to transport Indian Goods to Africam,
and from thence up the Wolga to Muscov, and to Riga by the Ri-
vers of Mosca and Duna. Duke Frederick of Holstein went unsuc-
cessfully about the same Project.

The Trojans were another Asiatick Nation powerful at Sea. Their
Empire began about the Year of the World 2530. Their Situation on
the Asiatick side of the Hellespont was the most commodious for Trade
and Navigation of any in the World, and raised them to a great height
of Splendor and Riches in a little time. But their Empire subsided
only about an hundred and forty years, being destroyed by the Greeks.

We come now to the Navigation and Commerce of the Carthagin-
nians. Carthage was founded or rather rebuilt by Dido about A. M.
3132. and peopled with a Colony of the Tyrrians or Phcenicians; so
that, as we hinted before, when the Pani are said to be the Inventors of
Navigation, it is to be understood of the Phcenicians. Horace calls
the Carthaginians and Tyrrians uterque Pernus, Cicero calls the Inha-
bbitants of Cadiz, Pani. The Carthaginians retain'd all the Cunning
and Industry of the People from whom they were descended. In
the Scriptures the Tyrrians are commended for their Skill in Carpen-
ter's work, and all other Arts relating to Architecture, they being
employ'd by Solomon in building the Temple.

The Carthaginians were always famous for dressing of Leather, an
Art which the Maroquines, Inhabitants of the same Country, posseks
to this Day. They were much jested upon by the Romans, and
call'd Porridge Eaters, for their Parsimony, being a Reproach they
were not ashamed of, but in return made as great a jest of the
Romans for their Scarcity of Plate, in one of their first Embassies,
as we observed before. The City of Carthage, at the beginning of

1 Upon this River Alexander built a Town, called Alexandria Oxiana.
3 Cyrus, now called Kur, it runs through Cicero pro Balbo.
4 Kings v. 6.
the third Punic War had 700,000 Inhabitants. It was once Mistress of three hundred Cities, possessed all that Tract of Land from the Straits of Gibraltar to the greater Syria, besides a great Extent of Territories without the Straits on the Coast of Africk, (where Hanno established many Colonies) and a part of Spain, particularly the magnificent City of Carthage, which they built: besides the Island in the Ocean far beyond the Straits of Cadiz, of which the Author of the Book of Wonders, attributed to Aristotle, and likewise Diodorus Siculus, makes such a Description, that many have been induced to believe it was America. The Objection of Bouchart, that such a Navigation could not be perform'd without the Compass, is so far of no force, that Diodorus tells you they were carried there by a Gust of Wind, probably the Trade Wind, which reigns between the Tropicks. So far is true, that the Senate of Carthage kept this Discovery of the Fortunate Island a great Secret, and forbad their People to transport themselves thither, for fear of dispeopling the Country.

Time has destroy'd two noble Journals of their Navigation, that of Hanno along the Coast of Africk without the Straits, and the other of Hamilcar along the Coasts of Europe: The Periplus, which is now attributed to Hanno, being supposed to be spurious. We shall have occasion to speak of the naval Affairs of this great People, as they interfered with those of the Romans.

The Greeks, so call'd at first from some very obscure Burrough or Prince, a Name which they changed for that of Hellenes or Achaeans, were the Descendants of Savages, ignorant of Agriculture, and browsing on Herbage like Cattle; witness the divine Honours that they paid to Pelasgus, who first taught them to feed on Acorns. Their own Countryman Thucydidse tells us, that when they were a little got out of their former miserable condition, they robbed at land, and pyrated at Sea.

By the Greeks may be understood, not only the Inhabitants of that part of the Continent called Greece, but those of the Islands of the Mediterranean, and the Coast of Asia Minor where they sent
Tables of Ancient Coins,

sent Colonies, without excluding the Sicilians and the Tyrrenians, and several of the Inhabitants of Italy. Minos, King of Crete, was the first Man that civiliz'd this Nation; he rig'd out a Fleet, and made himself Master of the Archipelago and it's Islands, leaving his Children Governors of the Countries he had subdued. After this the Greeks began to build Towns on the Sea Coasts. The Kingdom of Argos was founded by Inachus, according to common Chronology A. M. 1249. six hundred and seventy six years before the Destruction of Troy. The Expedition of the Argonauts happened A. M. 2743. (which account I set down only as conjectural, till the perfect one, which the World so much longs for, doth appear) it was partly mercantile, partly military. The Mystery of the golden Fleece is variously explain'd, either of the Profit of the Wool Trade of Colchis, or of the Gold that they commonly gather'd with Fleeces in the Rivers. The Ship Argo, in which they sail'd, was perhaps larger and better equip'd than any that had been before, but could not be of extraordinary size, since the Argonauts were able to carry it on their Backs from the Danube to the Adriatic Sea.

The next remarkable Expedition of the Greeks was against A. M. 2821. Troy.

Thucydides does not allow the poetical List of Ships in that Expedition; besides, as he saith, most of them were open Boats, and the Soldiers were the Rowers.

After the Trojan War the Greeks applied themselves with great diligence to naval Affairs. Thucydides gives the preference in Antiquity to the Corinthians, who were the Inventors of Triremes. After them the Ionians succeeded to the Empire of those Seas, and were able to maintain it against Cyrus and his Son Cambyses.

* The Phoca, who were the Founders of Marseille, were able to deal with the Carthaginians. In all those Wars there were few Triremes,
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Triremes, most of them being of one Tire of Oars of fifty Banks. But the Tyrants of Sicily, Gelon and Hieron, and the Inhabitants of Corfu augmenting the number of their Triremes, obliged other States to do so likewise.

Thucydides owns that in those early times the Athenians and Eginetes made no great Figure at Sea, their Ships being only of one Tire of fifty Oars: and this even when they put their chief Confidence in their Fleet in their War with Xerxes. Yet Xenophon (De Proven.) who wrote shortly after Thucydides, makes Athens a City of great Trade.

The Conduct of Sparta in this particular seem'd to be unaccountable; for they discourag'd Trade, and yet were very ambitious of maritime Power. Pausanias acquaints us, that before the Reign of Polydorus, King of Lacedæmon, Commerce was carried on without Species of Gold or Silver, only by the Exchange of Commodities. Trogus pretends, that this was rather from a principle of Virtue than Ignorance, and that Lycurgus had forbid the use of Silver and Gold Coin, from a prudent foresight of their mischiefous Effects. It is here to be observed, that the famous Games instituted in the several Cities of Greece were partly for Trade, as well as for the Encouragement of manly Exercises, being something of the nature of the European great Fairs.

It is with great Assurance that the several Cities of Greece dispute the Invention of different sorts of Ships, when the Phœnician and Egyptian Vessels, from whom undoubtedly they had their Models, were daily to be seen in their Harbours. They have indeed one thing which they may claim as an Improvement of the Phœnician Navigation; for the Phœnicians conducted their Ships by the Little Bear, and they by the Great Bear. But their Navigation was still confin'd to the Mediterranean, till about six hundred years after the Expedition of the Argonauts, when Celas of Samos sail'd out of the Straits of Gibraltar as far as the City of Tartessus, at the Mouth of the Batis, now Quadalquivir (an Arabick Word) not far from the said Straits.

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Inhabitants of a little Island over-against Athens; it is now call'd Engin.
*Polyocrates, Tyrant of Samos, taught the Samians their Arts, and carried their naval Power to a great height. He had an hundred Biremes, which were bigger than the Grecian Ships of his time.

After the Trojan Expedition, Commerce flourish'd among the Greeks. Solon himself, as Plutarch relates of him, repair'd his Fortune by Trade, which had been ruin'd by his Father's too great Generosity. There is a remarkable Passage in Plutarch on this occasion to the honour of Trade. "In those times (faith he) as Hesiod relates, no Labour or Profession was shameful, Trade made no Difference amongst Mankind. Traffick was in great Esteem, procuring honourable Alliances, and Knowledge of many things. Merchants have founded great Cities, as he who built Marseills, and was so well receiv'd by the Gauls. Thales is reported to have merchandiz'd, Hippocrates the Mathematician, and even Plato, whose principal Aim in his Egyptian Voyage was to sell his Oyl.

Cesfar the Rhodian, contemporary with Augustus, compos'd a History of such as had been possess'd of the Empire of the Mediterranean Sea from Minos down to the Athenians, for the Space of four hundred Years. From this Author Eusebius took the Lift of his Chronicle.

The Lydians, inhabiting the Country near Smyrna in Asia Minor, first in that Art, were the Inventors of Money, the principal instrument of Commerce.

The Pelasgi, so call'd from Pelasgus the Brother of Hermogynes, were antient and great Navigators; they first inhabited Arcadia, but peopled the Island of Lesbos, which from them was call'd Pelasgia. The Pelasgi built Spina at the mouth of the Po, which held the Empire of the neighbouring Seas till it was ruin'd by the Barbarians. The Tyrrhenians were their Neighbours, whose principal City was Luna, a good Harbour.

Of all trading Nations, none acquire'd a greater Reputation than the Rhodians; being constituted by the Romans as the sovereign Judges

\* Above Olympiad 69. \* Herodot. Lib. 3.
Weights and Measures, &c.

Judges of all Controversies relating to Commerce; and their Laws are appealed to, even at this Day.

The Phorceans founded the City of Marseills, which made a great figure at Sea. The Massilians sent Vessels into the Ocean, Southward under the Conduct of Euchymene, and Northward along the European Coast under the Conduct of Pythias.

About a hundred years before the time of Alexander the Great, the Athenians and Macedonians disputed the Empire of the Seas. Afterwards arose Philip King of Macedon, who endeavour'd to wrest it from them both; His Pretext for making War upon his Neighbours was their Pyracities: tho' when he wanted Money he practis'd the same Trade; particularly when he was straitned in his Finances at the Siege of Byzantium.

The Greeks all this while maintain'd their Commerce with the Egyptians, their Instructors in the Art of Navigation: Amasis, King of Egypt, assign'd them Neocratis for their Staple Port.

Before we speak of the great Revolution in Trade, which happen'd by the Destruction of Tyre by Alexander the Great, it will be necessary to say something of the Trade of the Arabians and Ethiopians.

Before the Egyptians traded to the Indies, their principal Commerce was with the Arabians. Arabia Felix (the Name of the Country as well as principal Port) was the Magazine of both the Egyptian and Indian Commodities. This Harbour was afterwards called Portus Romanus. The Country was likewise call'd Eden by an Hebrew Name, signifying Happiness or Delight, abounding in all the rich Commodities of the World.

The Trade to Arabia Felix, according to Pliny, cost the Romans yearly about 867,891 L. It was advantageously situated, there being an easy passage from it to Egypt, Ethiopia, Persia and India by Sea; and to Phoenicia, Syria and Mesopotamia by land.

The Country of the Ethiopians (by which may be understood all that tract of Land in the South of Africa from the Tropic of Cancer to the Ocean) abounded with several precious Commodities, as Silver, Gold, Ivory, some precious Stones, and
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the Wood Algummin. Those Commodities were likewise brought to Arabia Felix.

From these Considerations it will follow, that a Place, which had an easy Communication with the Sinus Arabicus, or the Red Sea, Egypt itself, Ethiopia, and likewise the Mediterranean, was a proper Staple for all the Trade of the World: therefore it was a very natural Thought in Alexander the Great, after the Destruction of Tyre, to establish the Seat of Trade at Alexandria, his Name-ake and favourite City, which had all those Advantages: besides he was induced to this in revenge to the Carthaginians, hoping that Alexandria, being situated between Tyre and Carthage, might get the Trade from them both; tho' at the same time he took care to establish a Colony of his own people at Tyre. Alexandria had the Island of Pharos before it, and the Lake Mareotis behind it, which communicated with the Nile. It soon grew an eye-fore to the Carthaginians.

Another mark of Alexander's great Consideration of Trade, was making Harbours at the Mouth of the River Indus, which he did by the Advice of some Phoenicians. He had undertaken a new Sea Expedition from the Phaloceras, a Branch of the Euphrates, to visit the Coasts of Arabia Felix, where he resolved to establish the Seat of his Empire. He intended to sail round the Cape of Good Hope, but all those great Projects were prevented by Death. During the last two Years of his Life, he had opened again the Trade between Egypt and the Indies: so natural was it for a Prince, who had proposed to himself the Empire of the World, not to neglect the Sea, the half of his Dominion.

His Successors pursued the Steps of their great Master in this particular. The Ptolomies in Egypt applied themselves diligently to Commerce. *Ptolomy Philadelphus, a Prince of an infirm Constitution, but of a noble Spirit, open'd the Water-carriage from Alexandria to the Indies, by establishing Staples on the Canals of the Nile, quite to the Red Sea. Of his Fleet, and particularly of two Ships of extraordinary Bulk, we shall have occasion to speak.

* About Olympiad 125.
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speak afterwards. Alexander had left Grecian Governors and Colonies in the Indies, but they were almost exterminated by Sandrocottus; Seleucus recovered the Sovereignty in some degree; but was forced to abandon to Sandrocottus, the Country along the Banks of the Indus, and some Cities which Alexander had built. Seleucus left Patroclus Lieutenant of that Country, who wrote Commentaries which are lost by the Injury of Time.

Ptolomy Philadelphus sent Dionysius, an able Mathematician, to the Indies, and Megasthenes Envoy to King Sandrocottus. Megasthenes left some Relations of that Embassy, of which there are a few Extracts yet remaining. Ptolomy sent afterwards Dimachus Envoy to Alcitrachades, Son of Sandrocottus, who likewise composed some Memoirs of his Negotiation. By those means the Indian Trade was restored again to Egypt, and continued during the Race of the Ptolomies.

The Successors of Alexander made war upon one another, particularly Seleucus upon Antigonus, in which there were great Fleets fitted out on both sides in the Meditarranean. Antigonus was a Prince of a great Genius; for, having to do with Ptolomy, Lytmachus and Cassander, Masters of the Sea, he sent out a Fleet with great Industry from the Coasts of Phoenicia, to dispute with them this Empire of the Sea: he had promised to his Army, who were discourag'd at the sight of Seleucus's Fleet, consisting of an hundred Sail, that at the end of the Summer they should see a Fleet of his of five hundred Sail: he kept his word nearly as to the Number, but effectually as to recovering the Command of the Sea. He made himself Master of the City of Tyre, which, even after the Destruction of Alexander, had recovered in some degree its Trade. This was a wonderful Effect of the Vigour of a great Prince, and a great Indication of a maritime Genius remaining in that part of the World.

Pliny speaks confusedly of the Navigations of Seleucus and Antigonus in the Cassian, which he erroneously supposed to be a Gulph of the Scythian Ocean. M. Huet justly complains of Alexander and his Successors
Successors for introducing great Confusion in Geography, by the ridiculous Vanity of new naming the places which they conquered.

The Descendants of the Successors of Alexander cultivated Navigation in some lesser degree with various Success, till they were all subdued by the Romans.

During the Wars of Seleucus and Antigonus, the Rhodians had signaliz'd themselves as Sea: it seems to have been the Policy of that wise trading Nation to keep an exact Neutrality, as far as they were able. They made in their Business to clear the Seas of Pyrates, and pursued their Trade; but as their Country subdused by Egypt, they had more Inclination for Ptolemy than any of the rest, therefore they were resolved generously to suffer the last extremities rather than enter into an Alliance with Antigonus against him. They sustain'd a Year's Siege by Demetrius, the Son of Antigonus, who had not his Equal in the Art of besieging Cities. He had a Fleet of four hundred Sail before their City; and yet after all they oblig'd him to raise the Siege, and made an advantageous Peace. They pursued the same Maxim with the Romans, cultivating their Friendship, but endeavouring to preserve their Neutrality. This embroil'd them afterwards with Philip of Macedonia, in his Wars with the Romans; and with Mithridates, who did not find his account in quarrelling with that great and wise Nation.

The History of Navigation about this Period is more particular and distinct, and in order to understand it, it is necessary to say something of the different Names, Figures, and Bulks of Ships. The first Division of Ships was into Ships of War, called by the Romans Classica, and Ships of Burthen or Onoraria. The first sort went with Oars, the second with Sails commonly, tho' both were sometimes used. The Classica were called long Ships, the Onoraria round, because of their Figure approaching towards circular or oval: This Figure, tho' proper for the Stowage of Goods, was not the fittest for Sailing, because of the great quantity of leeward way, except when they sail'd full before the Wind. There was likewise:
Weights and Measures, &c.

a mixt sort betwixt the long and the round, which Appian lib. 5. describes thus: Ostravia, imperata ab Antonio rentia, decem phaelos triresicos fratri dono misit, id est mixtos ex longarum forma & one- variarum.

Another distinction of Vessels was Aperta or open Boats, and Cataphractae, such as had Decks. The first were called Aphraete.

Some of the long Ships were called Attuarie, because of their great Swiftnes, which the French translate Brigantines. Cicero, in an Epistle to Atticus, calls a Ship Decem Scalmorum, of ten Banks of Ropers, Attuariola. The little Vessel, which Caesar went aboard of at Brundusium, Plutarch calls Πλοῖον Δύοκεκακάλμον, a Ship with twelve Banks of Oars. Suetonius calls it parvulum Navigium.

There were Myoparones, Hemiolia, Greek names for Ships of War, and may be properly translated Frigates; Lembi, little Ships, good Sailers, which the Pyrates used; they sometimes had Rostra.

Liburnae were a sort of light Ships, so called from the Liburni, a people of Illyria, who pyrated in them: They were Biremes.

Ordine contenta gemino crevisse Liburnae. Lucan.

The Romans called all their light Ships Liburnae or Liburnica.

Amongst the Ancients all great Ships had Scaphae or Boats.

In the first maritime Wars of the Greeks their Ships must have been very small, for * Xenophon writes that the Athenians put aboard a Fleet of an hundred sail, a thousand armed Men and four hundred Archers, about fourteen men a-piece, besides the Rowers. The Ships of Xerxes's Fleet must have been bigger; for, as † Herodotus relates, there were 1207 Ships, and aboard them, according to his Computation, two hundred and thirty men a-piece.

The manner of Sea Engagements of the Ancients (which was to bore and sink the Enemy's Ships with the Rostra) gave bulky and high Ships a great Advantage over their Enemies, by the force of

* Lib. 2., Hellen. † Herodot. lib. 7.
of the Stroak of a large Ship. The Height was likewise no small Convenience in boarding, and throwing of missile Weapons. So that it was much more true amongst them than amongst us, that a little Ship durst not lay her side to a great one: and tho' great Ships were commonly bad Sea Boats, they had a superior Force in a Sea Engagement. The Shock of them being sometimes so violent, that it would throw the Crew on the upper Deck of lesser Ships overboard. This occasion'd the Ancients gradually to encrease the Bulk of their Ships, till they came at last to an enormous size. This could not be done by one Row or Tire of Oars, but by several, therefore they built Biremes, Triremes, Quinqueremes, and, if we may believe them, some with forty Tire of Oars.

I shall not enter into the manner of construction of such large Vessels, seeming a thing impossible to moderns skill'd in Sea Affairs; however, that such Banks of Oars were not all in the same Plain, but rais'd above one another, is evident from the Figures and Descriptions of ancient Ships, and many other Passages of Authors.

In Triremes, the upper Rowers were called Thraniates, the middle Zygitae, the lower Thalamites. There is a passage in an old Scholast of Aristophanes that explains this matter otherwise, and tells you that Thraniates were in the Stern, the Zygitae were in the Midship, and Thalamites in the Prow: but he was a Writer of a later Age, ignorant of Sea Affairs, and lived after the time of Theodosius, when Triremes were no more used. Lucan, speaking of the Vessel of Brutus, tells us that the higher Oars touched the Sea at a great Distance.

--- Summis longe petit aquora Remis.

Silius Italicus lib. i4.

Intrat diffusos pellis Vulcania passim,
Atque implet dispersa foros, trepidatur omisso

--- Summis
Weights and Measures, &c.

Summis Remigio, sed enim tam rebus in artis
Fama mali nondum tanti penetravat ad imos.

By which Passage you see the Fire might be amongst the upper Tire of Oars before the knowledge of it had reach'd to the lower.

Arianus, speaking of a Biremis, saith αὐτῶν τὰς κάτω κόπας
οὐχ ἦν πώς ἔξω ἔχος τῇ ὕδατι, that the lower Tire of Oars were little above the Water.

The different orders of Rowers had different Rates of Pay. The Thranita, as *Thucydides tells you, had better pay, because they wrought with longer Oars. Appianus, lib. 5. de Bello Civili, has a passage, which puts the matter beyond all doubt, which translated runs thus: "Agrippa attack'd the Ship of Papias; he struck it under the Prow, and split it down to the Hold, those who were upon the Towers to defend the Ship were thrown overboard, the Water which the Ship took drowned the Thalamite; the Deck being broken, the other Rowers faved themselves by swimming." Thus we see in the Quotation from Silius Italicus, that when the Ship was fir'd aloft, the Thranita were in most danger; and from that of Appian, that when the Water broke in below, the Thalamite were drowned, and the Thranita escap'd.

Pausanias, in his Atticks, speaking of a Ship of Delos, saith that it had from the Deck downward nine Rowers.

A passage of Memnon, related and translated by Palmerius, runs thus: "The Leontophoros was a Ship admirable as well for its beauty as its bulk; it had eight Tire of Oars, an hundred at each Tire, eight hundred on each side, in all 1600." This passage and some others have occasion'd a great Dispute among the Antiquaries, whether there were more than one Man at the long Oars of ancient Ships, it seeming a thing impossible for such long Oars to be managed by one Man.

* Lib. 6.

All
Tables of Ancient Coins.

All the Writers of Tactic agree in this manner of Construction of Ships with several Orders of Oars, particularly an anonymous Author acquaints us with the Phrakology. Triacontoros, Tetracosuros, Pentacosuros, faith he, are so termed from the number of Oars; but Unirem, Birem, Trirem, &c. denote the number of Orders or Tires of Oars. If there were yet any doubt of this matter, the Figures of ancient Ships remaining are an ocular demonstration, in which it is observable, that the Columbaria, Pigeon-holes, as they were called, thro' which the Oars passed, are not placed immediately over one another in the same vertical plane, but by way of Quincunes, or chequer'd, which in effect brings the case to the supposition of Fabri, and the Problem is reduced to this, what perpendicular height is necessary to place several ranks of Rows, as it were upon Steps of Stairs in a Plain inclined to a horizontal Line in a given Angle? Quincunes, which were the greatest Ships in common use, are very possible after this manner.

There are some Ships of enormous Bulk, mention'd by the Ancients, built more for Oostentation than Use. Demetrius Poliorcetes, of whole naval Wars we shall speak afterwards, seems to have been the best Ship-builder amongst the Ancients, of whom Research reports, that the Bulk of his Ships surpriz'd his Friends, and their Beauty created some Delight in his Enemies. His built two Ships of sixteen and another of fifteen Orders of Oars, which moved as early as those of a lesser size; and warlike Machines for Sieges so well contriv'd that they astounded his Enemies: so that Lygimachus, his mortal Foe, having obtain'd the favour of seeing his Ships and Machines, surpriz'd at the Constancy, cried out, that they were built with more than human art.

Athenæus gives the following List of the Fleet of Ptolem Philadelphus; two of thirty Tires of Oars, one of twenty, four of thirteen, two of twelve, fourteen of eleven, thirty seven of seven, five of six, seventeen of five, double that Number of four, and of three and an half which were called Triremes, the rest of the Ships, which were distributed throughout the whole Empire, were above four thousand.
What Athenaeus relates from Callimachus of two ships built by Polybius Philopolus is still more surprising: "That Prince, said he, built a ship of forty ranks of oars, its length was 280 cubits, breadth 38, the distance on the prow was 48 cubits above the water, that on the stern 3. It had four rudders, each of 30 cubits. The oars of the thirtieth and highest ranks of rowers, 38 cubits, which were easily managed because the part within the ship was counterpoised with lead. It had two prows and two stetts, twelve decks, each 600 cubits in circumference. To give the ship her due motion, required 4,000 rowers, and 400 other seamen; 2,800 soldiers to defend it, besides a great number of other officers, as Commanders of Provisions, &c. I shall not enter into the Credibility of this description, or the mechanism of the ship: only taking the account as is stated, and comparing it with one of our first rates of 100 guns, of which I believe the dimensions may be length of the lower gun-deck 170 feet, length of the keel for turnage 235 feet, breadth from one to one 48, depth in the hold 195. By the common rule for measuring of turnage the length of the keel 35 x 48 the breadth, and this multiplied by 2 4 the half breadth, dividing the product by 95, because we suppose both ships without guns, will give: in round numbers 16 3 7 for the turnage.

In the measure of Polybius's ship, because it was a Greek who describes it, we shall make use of our own cubit of a foot and a half, which differs very little from the greacin: the dimensions of the ship are

<table>
<thead>
<tr>
<th>Cubits</th>
<th>Feet</th>
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<tr>
<td>Length</td>
<td>280</td>
</tr>
<tr>
<td>Breadth</td>
<td>38</td>
</tr>
<tr>
<td>¾ Breadth</td>
<td>19</td>
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480 x 57 x 28.5, the product is 682290; which divided by 95 gives 7182.1, so that the proportion of the burden or turnage of this ship of Polybius to one of ours of an hundred guns is 7182 to 1637, near 43 to 1. This

* Gratings.
† Quarter-deck.
Tables of Ancient Coins,

This Computation proceeds on the Supposition that those Ships were similar Solids, which perhaps is not true, but we can compute on no other.

The Thalamegus was a Ship built by the same Philopator for Sailing on the Nile, describ'd likewise by Calixenus of a surprizing Bulk, Beauty and Expence. We shall not enter into a Detail of all the particulars, it being rather a floating Palace than a Ship, but consider it in relation to our present purpose as to the Dimensions, which stand thus,

<table>
<thead>
<tr>
<th>Greek</th>
<th>Feet</th>
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<tbody>
<tr>
<td>Length</td>
<td>Stadium or 300</td>
</tr>
<tr>
<td>Breadth</td>
<td>30 Cubits or 45</td>
</tr>
<tr>
<td>3 Breadth</td>
<td>15 Cubits or 22.5</td>
</tr>
<tr>
<td>Depth</td>
<td>40 Cubits or 60</td>
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</tbody>
</table>

And \(95 \times 45 \times 22.5\) give \(303750\), which divided by \(95\) makes \(3197\) Tuns for the Burden: so that the Thalamegus was about double one of our 100 Gun Ships. But a more exact way of computation will be, instead of taking half the Breadth to take the Depth of the Hold, which is proportionably much greater in the ancient Ships abovementioned than in ours, and indeterminately expressed in the Description. For in the first Ship the Height of Acrobolion above Water is mentioned to be 48 Cubits: in the second, the height of the Tent or Auning above Water 40 Cubits.

Hiero, King of Syracuse, employed Archias under the Direction of Archimedes, to build a Ship of immense Bulk and Expence. Archimedes writes that there was as much Wood cut from Mount Altne, as would have built sixty Triremes, besides a great deal of Plank that was brought from Italy and other parts of Sicily. The Ship was built by halves, and the one half being finished, and by help of a Screw invented by Archimedes launch'd into the Water, the other half was join'd to it by great Brass Nails, weighing above ten pound a-piece, mortiz'd with Lead. It would be too tedious
Weights and Measures, &c.

tedious to relate all the Conveniences, Apartments, Gardens, Walks, Baths, &c. aboard this Ship; among other things there was a Fifth-pond, and a Reservoir holding two thousand Metretes of Water, that is, according to the Tables, above eighty five Tuns. It had several Tenders, particularly one mentioned, that was of the Burden of three thousand Talents; a Talent was sixty Mina, and the antient Attick Mina was our Pound Averdupois, consequently two Talents made an hundred and twenty Pounds, called a hundred Weight, and forty Talents made a Tun, therefore this Ship was just seventy five Tun. There were other Tenders, which the Author faith were only five hundred Talents, or the sixth part of this, viz. twelve Tuns and an half.

There is great reason to believe that the antient Merchant Ships were much less than ours. Cicero tells you in his twelfth Epistle to Lentulus, that they discovered by intercepted Letters that Dolabella design'd, when his Affairs grew desperate in Syria and Egypt, to pack up bag and baggage, and sail for Italy, and for that purpose was about to seize upon transport Ships, the leaft of which was of two thousand Amphora, that is about fifty six Tun, which it seems he thought a large Ship; if it were only the measure of the Capacity, and not of the Burden, it would be still much less.

Pliny lib. 16. cap. 40. speaks of one very large Ship of Burden, which brought over from Egypt the great Obelisk that stood in the Circus of the Vatican in the Reign of Caligula; which besides the Obelisk itself had 120000 Modii of Lentes for Ballast, 120000 Modii make 1138 Tun.

All those great Ships above mentioned fall very far short of the Capacity of the Ark, which, according to the Dimensions given us in the Scriptures, was 300 Cubits in length, 50 in breadth, and 30 in height: which supposing it a Parallelepiped, gives the Content 30x50x300 = 450000 solid Cubits. The Cube of the Jewisb Cubit in Feet and Decimals of a Foot is 6.068404224; this multiplied into the former Sum, gives 2730781.9 the Content of the Ark in Feet; 33,6875 cubical Feet make a Tun, therefore
fore dividing $27,078\frac{1}{2}$ by $33,687\frac{1}{2}$, the Quotient is $8106\frac{2}{3}$.

Tuns, the Capacity of the Ark; which being flow'd with things of no greater, and chiefly of less specific Gravity than Water, would make the Capacity not much different from the Tunnage.

But, to return to the History of Navigation,

*The Carthaginians endeavoured to extend their Empire and their Commerce by the Conquest of Spain, Sicily, and Sardinia. They attack'd Sicily with various Success, and often lost there great Fleets and Armies. The two Dionysus maintain'd their Tyranny there with great Conduct and Force for fifty years together, with a Fleet of five hundred large Ships, $10,000$ Foot and $10,000$ Horse*. Dionysus the father had once chased them out of the Island. He was the first who built Quinquiremes. Timoleon, who came after the Dionysus, forced the Carthaginians a second time out of the Island, tho' they had manned out against him a Fleet of two hundred men-of-war, and above two thousand Ships of Burden. These ill Successes did not discourage that ambitious and interested People, who looked upon Syracuse as the Rival of Carthage; they still pursued the same Scheme, and found afterwards a more dangerous Enemy in Agathocles, who from a Pyrate raised himself to be Tyrant of his Country. He not only beat the Carthaginians in Sicily, but besieged them in their Capitol in Africk, and restored the Sicilians to the Empire of those Seas. After the Death of Agathocles the Carthaginians renewed their Pretensions upon Sicily; the Sicilians called to their aid Pyrrhus, King of Epirus, who joining his Ships to those of the Syracusians, composed a Fleet of more than two hundred Sail! beat the Carthaginians at Sea, and made himself Master of the Island. But the Romans having obtained the same Advantages over him in Italy, as he had obtain'd over the Carthaginians in Sicily, obliged him to abandon both Italy and Sicily.

* About A. M. 3595. Olympiad 92.  
* Vid. Diodor, Sicul. Justin, & alios.  
* About Olympiad 109.  
* About Olympiad 117.
Weights and Measures, &c.

The Carthaginians disputed with the same obstinacy the Possession of Sardinia, and with no better Success. Their Attempts on this Island was the cause of the second Punic War, of which we shall speak afterwards.

The Tyrians, from whom the Carthaginians were descended, had established a Colony at Cadiz; the People of Cadiz procured their aid against the Spaniards, in which War they had got possession of some part of Spain. The great Hannibal afterwards extended their Conquests as far as the Eber. They were beat out of that Country by the Romans, of whose naval Power I shall now begin to say something.

The Romans, invited by the Example of their Neighbours, and compelled to it by Necessity, began to think seriously of acquiring a maritime Force. Polybius tells us, that before the first Punic War they had not thought of the Sea: this is not to be understood in a strict sense; for the same Author makes mention of a Treaty between them and the Carthaginians, Ann. U. C. 245, in the time of the first Consuls, which was two hundred and fifty years before the first Punic War, in which they engaged themselves not to sail beyond the North Promontory of Carthage, unless compelled by Necessity.

The Navigation of the Romans is regulated by particular Clauses in that Treaty. In the year of Rome 404, there was another Treaty of Commerce made with the Carthaginians, in which the Tyrians and People of Utica were comprehended as Allies of the Romans. It appears by these Treaties, that the Romans had not only practised the Sea, but pirated on it. The third Treaty between the then Romans and the Carthaginians, was made in the year of Rome 473. By this Treaty it appears, that the Romans had very much neglected their maritime Affairs, for they stipulated with the Carthaginians to furnish them with Ships both for Transport and War. In the year of Rome 416, seventy-four years before the first Carthaginian War, the Romans had seiz'd upon the Fleet of the Antines, now Capo de Auxo, consisting of twenty two Ships, among which
Tables of Ancient Coins,

which there were six armed with Rostra, with which the Consul Manius adorn'd the publick place of Oratory. These are plain Proofs of the Romans having applied themselves to the Sea, before the first Carthaginian War.

It was in vain for the Romans to think of carrying on the War in Sicily against the Carthaginians, without a naval Force; and perhaps nothing can give a greater Idea of the most invincible Courage and Industry of that People, than this first Effay of their naval Preparations; having built in the space of sixty Days from the time of cutting down the Timber a Fleet of an hundred Quinquiremes and twenty Triremes, upon a Model of one of the Enemy's Ships which chance had made them Masters of. They had been us'd before to wait over their Troops into Sicily in borow'd open Vessels. The Reader will find a very particular Account of this War in the first Book of Polybius, by which he may form likewise some Idea of the Vessels of that time: For five years after the beginning of that War the Romans rigged out a Fleet, in which there were 140,000 Men that bore arms. The Fleet consisted of three hundred and thirty Vessels; in each Galley they had three hundred Rowers and an hundred and twenty Soldiers; for the number of Men being divided by the number of Ships gives four hundred and twenty four men a-piece.

The Carthaginian Fleet consisted of three hundred and fifty sail, with 15,000 fighting men aboard, which is more than four hundred and twenty eight men in every Ship. This shews that their Ships were very large. And who now (as Polybius faith) would contemplate the mighty Hazard to which those two contending States were expos'd, and but hear the relation of the Preparation of such Fleets and Armies without Astonishment; and taking part of the Peril with which they threatned each other. The Event was, that the Roman Fleet (although built by Shipwrights, and conducted by Pilots, both without Experience) defeated that of the Carthaginians *, both in the first and second Battle; and had made the

* Olymp. 131. U. C. 498.
Weights and Measures, &c.

the Romans Masters at Sea, had it not been for their Losses by Shipwreck; by which, the first year of the War, their Fleet, consisting of three hundred and fifty four sail, was reduced to eighty. To repair this Loss they built a hundred and twenty Ships in three Months time, and put to Sea with a Fleet of three hundred sail, of which they lost again the half by Shipwreck. This Fleet they recruited with two hundred sail, whereof they lost ninety three in a Sea-fight the year afterwards. This was attended by another Loss: for the Consul Junius passing over into Sicily with a Reinforcement of an hundred and twenty Gallies, and more than eight hundred Ships of Burden, his Fleet was destroy'd by a furious Tempest. These Losses obliged the Romans to abandon the Sea to the Carthaginians, who by their Infolence and ravaging the Italian Coasts opposite to Sicily, forced the Romans again to try their Fortune at Sea with a Fleet of two hundred sail, under the Command of Lutatius the Consul, who obtain'd a compleat Victory over the Carthaginians in the year of Rome 511. After which these People were obliged to demand Peace, and give up to the Romans all their Possessions in Sicily. This Sea War cost the Carthaginians five hundred Quinqueremes, and the Romans seven hundred, including their Shipwrecks.

The Roman Shipwrecks were occasion'd undoubtedly by their Ships being bad Sea-boats, and themselves but indifferent Seamen. For mere personal Valour could not supply want of knowledge in building and working their Ships. Of which there cannot be a greater Indication than that of the Rhodian Ship, which passed thro' the whole Roman Fleet, backwards and forwards several times, carrying Intelligence to Drepanum. Polybius saith, that the Rhodian Captain relying on his Knowledge and the Lightness of his Vessel, passed in open day through all the Guards of the Enemy that awaited him; and in a kind of Mockery and Contempt of the Enemy, he would often lie upon his Oars, and then take a turn, and go quite round them, as if it were to provoke them to fight. This Ship by good luck fell into their Hands at last, and served as
Tables of Ancient Coins,

a Model to build others by. One cannot help making this Observation, that the People of that time must have been either more faithful to their Country, or better governed than those in our days; for if the Roman Government subsisted now, they would have had renegade Seamen and Shipwrights enough to have served them on this occasion.

A little before the time of this first Carthaginian War lived Hieron King of Syracuse, a wise Prince skill'd in maritime Affairs, of whose naval Architecture we have given a former Instance.

Ten or twelve years afterwards the Romans were engaged in a new War against the Illyrians, Inhabitants of the Eastern side of the Adriatic Gulph, who under the Authority and Permission of their Queen Teuta infested all the neighbouring Coasts with their Pyracies. Teuta had the Insolence to put to death one of the Roman Ambassadors; she was obliged, by a vigorous and successful War which the Romans made, to consent to give up all the Sea Coast, except a very few places; to reduce her Fleet two unarmed Brigantines, and not to fail beyond the City of Lissus, now called Aleso or Alcesa in the Neighbourhood of Dyrrachium, Durazzo in Albania. It was the constant Method of the Romans to disarm those Nations whom they had vanquished at Sea: for what other Security could they have, it being impossible to bridle their Power in that Element by Garrisons, as at Land.

The Illyrians broke this Treaty, and the Illyrians put to Sea fifty Brigantines, in which they sail'd beyond the Lissus as far as the Cyclades; but they were vanquished by the Consul Semilius.

The Island of Sardinia, and the Un鹻iness of the Carthaginians under a great Sum that was exacted from them by the Romans, were the causes of a second Punic War; in which the Fleets of both Nations seem'd to be less numerous than in the first. The Romans, according to their usual Spirit, when their Affairs were in the utmost Extremity in Italy by the terrible Invasion of Hannibal, Olymp. 140. U. C. 536. ordered Scipio to pass with a Fleet to
Weights and Measures, &c.

to Sicily, and from thence to Africk. He with a Diligence, almost past Credibility, built, rigg'd and arm'd twenty Quinquiremes, and thirty Quadriremes in forty five Days, reckoning from the time of cutting down the Timber, a great part of which was green. The Victory he obtained over Hannibal in Africk put an end to that War. The Carthaginians beg'd and obtain'd Peace upon the very hard terms of having their Fleet reduc'd to ten Gallies, Scipio having burnt the rest before their eyes to the number of five hundred of all Rates. What a miserable Spectacle was this for a Nation that had been Mistress at Sea so long? By this Treaty they were not only restrain'd as to their Ships of force, but the very Bulk of their trading Vessels was regulated. It was remarkable in this second Punick War, that whilst Hannibal was victorious in Italy at Land, the Romans beat the Carthaginians at Sea.

The next Affair which the Romans had at Sea was with Philip King of Macedon, who after the Battle of Cannae had entered into a Confederacy with Hannibal, of which the principal Article was, that he should invade Italy with two hundred fail of Ships. In the year of Rome 540, the Praetor Larvinius commanding the Fleet upon the Coast of Brundusium (now Brundif) and Calabria, embarked an Army aboard the Fleet, and forced Philip to raise the Sieges of *Oricum, and of †Apollonia, obliged him to retire into Macedonia by Land, and to burn the greatest part of his Fleet, consisting of an hundred and twenty Biremes. The very same year the Cities of Eubea were attack'd by three powerful Fleets, the Roman, that of Attalus King of Pergamos, consisting of eighty Quinquiremes, and that of the Rhodians of twenty Catapultae, that is, covered or close Ships. Twelve years afterwards Philip engaged near the Island of Chio the Fleet of Attalus, and that of the Rhodians consisting of sixty five Ships of War, besides some of the Byzantines Philip's Fleet consisted of fifty three cover'd

*Iricum on the Coast of Epirus, built by the Colchians. †Apollonia, a City of Macedonia, now called Pollina.
Tables of Ancient Coins,

ver'd Gallies, besides several open Ships, and an hundred and fifty Galliots and Ships called Prıfets, from the Figure of a Whale on their Prow, as a Mark of their extraordinary Swiftness. Philip at last being beaten by the Romans under the Conduct of Q. Flaminius, obtai'n'd peace upon the hard condition of delivering all his cover'd Vessels to the Romans. They left him some small Vessels, and one Galley of a prodigious size, which was said to be of sixteen Ranks of Oars. This great Ship carried the Consul Paulus Aemilius to Rome, after he had vanquish'd Perseus the Son of Philip.

Antiochus, surnamed the Great, at the Instigation of Hannibal, disputed with the Romans the Empire of the Sea with the same bad Success. He had an Admiral of great Experience, one Polyxenidas. The Romans had the advantage of the Battel by the Bulk of their Ships, and the Fleet of Antiochus in the Swiftness and Mobility of theirs, which served them in great stead in the Flight. Polyxenidas despised the Fabric of the Roman Vessels, affirming them to be in seke Favas & immobiles. The Battel was fought on the Coasts of Ionia. The Rhodians attacked a recruit of Vessels, which Antiochus was bringing from Sicily; but Polixenidas his Admiral, a very able Officer, surpriz'd the Rhodian Fleet, together with a part of the Roman at the Island of Samos: there were hardly seven Vessels that escaped, twenty were taken and carried to Ephesus. Aemilius Regillus succeede to Livius in the command of the Roman Fleet, and with eighty sail beat that of Antiochus under the command of Hannibal and Polyxenidas, consisting of an hundred covered Vessels. The Romans took thirty of them, and burnt or sunk the rest. The Defeat of his Army at land at the same time extinguished his Hopes of disputing with the Romans the command of the Sea. He was obliged to abandon all the Asiatick Coast between the Sea and Mount Taurus, to deliver all his Fleet to the Romans, except ten middle-siz'd Brigantines, with which he durst not sail beyond the Promontories of Cilicia.

In execution of this Treaty, fifty great Vessels were burnt by the command of the Roman Consul. His Son Antiochus Eupator, in
Weights and Measures, &c.

defiance of this Clause, began to augment his Fleet: but the Roman Senate ordered his supernumerary Vessels to be burnt.

Hannibal apprehending least Antiochus, after his Defeat, should be obliged to deliver him up to the Romans, went into the Service of Prusias, King of Bithynia, and commanded his Fleet against Eumenes, King of Pergamos, an Ally of the Romans. Being fruitful in Stratagems, he threw into the Enemy’s Ships earthen Bottles filled with Serpents, which put the Crew in Disorder, and made them fly. This was the same Prusias, who join’d with the Rhodians in a War against the Byzantines, and stop’d them from levying their Toll upon the Trade into the Euxine Sea.

The Aetolians were the next that by their Insolence drew the Arms of the Romans against them. The Consul Fulvius took their Capital City Ambracia, and reduced them to beg Peace, which they obtain’d by the Intercession of the Athenians and Rhodians. The Istrians who had join’d with them were Fellow-Sufferers. After this the Romans were Masters of all the Isles from the Coast of Epirus to the Cape of Malleum.

Nabis, who had possessed himself of the Coast near to Sparta, and there pirated outrageously upon all the Peloponnesian Trade, was the next that felt the Power of the Roman Arms. The Consul attack’d him with a Fleet of forty sail, eighteen close Gallies of Rhodes, and ten others of King Eumenes, obliged him to deliver up his Fleet, and restore the Ships he had taken to the Proprietors, reserving only to himself two Brigantines. Notwithstanding which he rigged out another small Fleet, and the Achaens ingaged him with theirs, not waiting for that of the Romans. Philopomen, a great Captain at land, but a bad Admiral, took the Command upon him, and was beaten by Nabis. He made afterwards a Truce with the People of Rome, but before it expired he was kill’d by the Aetolians. After which Sparta entered into the Alliance of the Achaens.

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1. A Province of Natoila.
2. In the Lesser Mylia. There was a famous Library at Pergamos.
3. Epirus lies between Macedonia and the Ionian Sea; it is now called Canina.
4. Now called Cabo Malio in the Morea.
Tables of Ancient Coins,

The Rhodians, tho' Friends and Allies of the People of Rome, were not perfectly well pleased with this great Superiority of their maritime Power. They would fain have made themselves Arbitrators between the Romans and King Perseus. They spoke in a very high style to the Senate, and complain'd of a great many Grievances; but chang'd their Language much after the Defeat of Perseus, laying the blame of this Proceeding on some particular Citizens. No body could be surpriz'd that so wise a People should have such Sentiments.

*Perseus, after having in vain solicited his Neighbours for aid, sent Envoys to Carthage, to kindle after their ancient Hatred against the Romans: He had a numerous Fleet, and some Ships of great Bulk. The Romans during this time had neglected a little their Sea Affairs, and their Fleet was ill man'd; but a Victory by Land over Perseus soon ended the Quarrel; and he himself being taken Prisoner in the Island of Samothracia, whither he had fled, was carried to Rome. It was on this occasion that Paulus Emiliius entered the Tyber in the above-mentioned royal Ship of Perseus of sixteen Ranks of Oars. Gemius King of the Illyrians had the same fate.

The Romans were surprized to see two captive Kings, and the successful end of a War, of which they knew not the beginning. But as a mark that the Romans considered their maritime Power more in relation to War than their Trade, they made a present of an hundred and twenty Brigantines of the Fleet of Gemius to the People of Apollonia, Corcyra (now Corfu) and Dyrrachium (Durazzo.)

Polybius tells us, that from the Defeat of Philip King of Macedon till a considerable time after that of Perseus, the Romans had absolutely neglected the Coast of Illyria.

All this while the little Asiatick Princes carried on maritime Wars against one another.

During

ynthia. 150. U. C. 570.
Weights and Measures, &c.

During the Roman Wars in Macedonia the Carthaginians were preparing to shake off their Yoke. The Romans were informed of their secretly laying up naval Stores. Ambassadors were sent to Carthage, under pretence of terminating the Difference between the Carthaginians and Masanissa. These Ambassadors were like to have been torn to pieces by the populace, but were convinced by ocular Demonstration of the naval Preparations of the Carthaginians. Whereupon the Romans quickly fitted out a Fleet against them of fifty Quinqueremes, and a great many other Ships. The Consul Manlius commanded the Land Army. The Carthaginians, surprised at so sudden an Attack, followed the Example of Utica, which had submitted to the Romans; who began by burning the Carthaginian Fleet; and, after having seiz'd a great number of Hostages, acquainted them with their resolution of destroying their City, and settling them on the Continent five Leagues from the Sea. Upon hearing this, they were seiz'd with Fury, and resolved to suffer the last Extremity rather than submit to such cruel Terms. They were besieged in form by Sea and Land. After Scipio had taken away the use of their Harbour, they dug a new one at another Quarter of their City, through which they sent a Fleet of an hundred and twenty Ships of War, which attack'd the Roman Fleet, and burnt a part of it: but after all their vain Efforts, the City of Carthage was taken by the Romans seven hundred years from its Foundation, and six hundred and eight after that of Rome. The Romans burnt the remainder of this last Fleet, which is another mark of their small Attachment for the Sea. Carthage at that time had seven hundred thousand Inhabitants, as we said before: and nothing could be a greater Sign of their Power and Riches, than that last Effort they made for their Preservation. But succeeding times plainly shewed the Romans the Advantage of a City situated on that place. For, not to mention the Attempt of the Gracchi to rebuild Carthage, it was at last finish'd by Augustus, and peopled

*Old Carthage stood about twelve Miles from Tunis towards the Sea. There is a small Village there now.*
Tables of Ancient Coins,

...pleased with Romans and Africans, two hundred years from the time of its Ruin, according to a Project left by Julius Caesar.

After the destruction of Carthage, the Romans began to have a regular Commerce in Africa. It consisted chiefly in the Sale of Slaves carried to the Island of Delos, which by the happy Circumstance of being reckoned a sacred place, grew to be a free Port, where Nations warring with one another resorted with their Goods, and traded as in a neutral Country.

The Destruction of Carthage was soon follow'd by that of Corinth, a City famous for Trade and Navigation; it had two Harbours, that of Senechas on the Aegan Sea towards the East, on the Western side the Port of Lechaum; it was called by Philip of Macedon the Chain of Greece. The Corinthians were said to be Inventors of Trivemes, and of Weights and Measures; tho' both their Sea-craft and Arithmetic came originally from the Phoenicians. But at last their Impudence in violating the Right of Nations, and ill treating the Roman Deputies, drew the Vengeance of that People upon them: and the Consul Mummius, after having beaten their Army, took, pillag'd, and burnt their City; which was afterwards rebuilt by Julius Caesar.

The Destruction of those two famous trading Cities, Carthage and Corinth, fill'd the Seas with Pyrates: their Inhabitants having no certain abode, nor any other way of subsisting. The Romans at that time were engag'd in a dangerous War against Mithridates, who was powerful at Sea, and used the Assistance of the Pyrates to reduce the Roman naval Power. Antonius attack'd the Pyrates of Crete, and by his too great Presumption was defeated, upon the Sense of which affront he died with Grief. This Loss was repaired by Q. Metellus Proconsul, who subdued all the Island, the Inhabitants of which had been free from the time of Minos. The Pyrates of the neighbouring Coasts, Pamphylia, Cilicia, and Lycia had the Courage to engage the Roman Fleet with their small Vessels,

g Corinth stood upon the Isthmus which joins Peloponnesus to the Continent, between the Sinus Corinthiacus (Golfo di Lepanto) and the Sinus Saronicus (Golfo di Egina) and so most conveniently for Trade.

h Provinces on the South side of Asia Minor.
Weights and Measures, &c.

fels, but were routed, and their little Fortifications destroy'd. The Romans, as they were grown formidable, were likewise become odious to the Inhabitants of Asia, Greece and Egypt, which made those Nations extremely respectful to the orders of Mithridates. The Rhodians alone kept their Faith with the Romans: Their Island was a Retreat to such as escap'd from the Barbarities which were practis'd by that Prince at Sea; who for that reason attack'd the Rhodians with a mighty Fleet; but his design was render'd abortive by the superior Art and Conduct of the Rhodians. Lucullus, under the command of Sylla, having with some difficulty collected a great Fleet, shut up Mithridates in Pitany, a City of Troas, whilst Fimbria besieged him by Land. Fimbria was a Person of so bad a Character, that Lucullus would not enter into any Association with him; but acting by himself, twice beat the Fleet of Mithridates. Yet I think there lies a great Suspicion upon Archelaus the King's Admiral, who deliver'd up seventy Ships, near a third part of his whole Fleet, and persuaded his Master to consent to it, and afterwards took service with his Enemies. Mithridates escap'd at that time, and revenged himself upon Cotta, Collegue of Lucullus. After the Death of Sylla, Cotta was beaten by Sea and Land (having lost sixty Ships) and afterwards besieged in Chalcedonia. Lucullus rais'd the Siege, and shut up Mithridates himself in his Camp before Cyzicus, a Town of Mycia, which that Prince had besieged. Mithridates chose the Sea as the securest Retreat, but lost sixty Men of War by a violent Storm, as he was sailing into the Euxine by Byzantium; he escaped narrowly himself aboard a small Privateer, who carried him back to his Kingdom. Lucullus pursued the rest of the Fleet, sunk thirty Men of War on the Coasts of Troas and Lemnos; and at last made himself Master at Sea; having with singular Modesty and Frugality refus'd 3000 Talents, or 581250l. which the Senate had order'd him to refit his Fleet. He brought to Italy an hundred and ten rostrated Galleys of the Fleet of Mithridates, and by his Behaviour in that War, and all the future part

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1 About Olymp. 177. U. C. 685.

2 Cyzicus is situated on the Propontis.
Tables of Ancient Coins,

of his Life, has left one of the greatest Characters of Anti-
quity.

All this while the Pyrates grew very numerous, and form'd a
fart of Republick, which grew to such a degree of Power and
Insolence, that a Merchant Ship durst not put to Sea. The ordinary
Convoys of Provisions for Rome were intercepted, and the City
was like to be famished. The Towns and Temples on the Sea
Coasts of Italy were pillaged, or put under Contribution. The
Pyrates appeared with great Fleets even at the Mouth of the Tiber.
They had of all sorts above a thousand Ships, of which they for-
med regular Fleets. They had their several Ports and Maga-
zines, but Cilicia was their principal Resort, from whence they
fitted out their Squadrons as occasion requir'd. So pressing an Evil
demanded a powerful and speedy Remedy. Pompey was entrusted
with a command greater than had been given before to any Ro-
man Citizen, and which, according to the reasonable care of Li-
berty in that time, and afterwards lost, gave much Jealousy. It
was no less than the command of all the Seas from the Straits of
Gibraltar to the Thracian Bosporus, with the bordering Coast fifty
Miles up the Country. He had a Fleet equip'd of Romans and
their Allies, consisting of five hundred Sail. With this Strength
he defeated the Navy of the Pyrates on the Coast of Cilicia, and
by a Conduct peculiar to himself, put a happy end to the War,
of which I think the most prudent part was his Moderation and
Indulgence, not reducing them to desperation; but after having
forbid them the use of the Sea, appointed them fix'd Habitations
and Lands to cultivate in the inland Countries; which kind usage
made them afterwards the most faithful Subjects of the people of
Rome. The successful Management of this War, which he fi-
nish'd in three Months, makes perhaps the most glorious part of
the Life of Pompey, and exceeds (in my Opinion) the greatest Actions
ever perform'd by Caesar.

1 Olymp. 178. U. C. 687.
Weights and Measures, &c.

The Navigation of the Mediterranean was now free, but the Romans enjoyed the Fruits of this Commerce very little, for their Trade was War. Another Scene of Action opened to the Romans; who, after the Conquest of Gaul, sent Shipping into the Western Ocean. After Caesar had subdued the Belgæ, the Venetiæ, a People inhabiting the Country about Vannes in Brittany, whom Strabo makes of the same Nation with the Belgæ, foreseeing that Caesar intended to invade Britain, with which they had great Commerce, resolved to divert him from his purpose by creating him some Disturbance in Gaul. The Venetiæ were very powerful at Sea, and a maritime Force was very necessary to attack them: Caesar therefore gave order to build his Gallies on the Loir, and the Rivers that fall into it. He made Decimus Brutus Admiral of the Navy, with orders to sail towards the Venetiæ with what speed he could, himself in the mean time marching towards them with his Land Forces. He tells us in his Commentaries, that the Tides were so much their Friends, and their Ships so accommodated to the nature of those Seas, that they could easily remove themselves from one Town to another, and so deluded him the greatest part of the Summer; they made use of Iron Chains instead of Cables, and raw Hides instead of Sails. When his Fleet arrived, there was but small hope of success against two hundred and twenty of Ships, of such height and strength that his Vessels could do no execution upon them: To supply those Inconveniencies he made use of this Device: he ordered his Men to arm long Poles with sharp Hooks or Seythes, wherewith they took hold of the Tackling which held the Main-yard to the Mast of their Enemies Ship, then rowing their own Ship they cut the Tackling, and brought the Main-yard by the board; thus the Venetiæ lost the use of their Shipping, and the Contest fell within the compass of Valour, in which the Romans were superior; the Venetiæ having lost the greatest part of their Fleet and their best Men in this Battle, were not able to make any farther resistance.
Tables of Ancient Coins,

This Obstacle being removed, *Cesar* invaded *Britain* with eighty Transports, on board of which he put two Legions and the Officers of some Gallies. He had likewise prepared eighteen Transports for his Cavalry. He observes that the Figure and Use of the Gallies appeared strange to the *Britons*.

To say no more of that Expedition, the ill Success of which was in great measure owing to the Storms that disordered his Fleet; the bad disposition he made in landing his Men, shews him not only to be much inferior to *Pompey* as a Sea Officer, but to have had little or no Skill in that Element.

He invaded *Great Britain* a second time, with a Fleet of eight hundred Ships, on board of which there were five Legions and two thousand Horse.

Before those times the *Spaniards* and *Phenicians* had great Establishments in *Spain*; they traded to the Western part of *England*, and the other *British* Isles, comprehended by the Ancients under the general Name of *Cassiterides*, from the Tin with which they abounded. The Commerce of Lead and Tin was so lucrative, that they kept it a great Secret. *Strabo* relates that a *Phenician* being pursued by a *Roman* Vessel, chose to dash his Ship against the Rocks, to draw the *Roman* after him, rather than discover his course. *Publius Crafsus* afterwards made that Voyage, and published his Journal: Both *Diodorus Siculus* and *Tacitus* acquaint us that Trade had civilized the Inhabitants of *Cornwall* more than those of the other parts of *Great Britain*. *Strabo* relates that the Commodities of *England* were Corn, Cattle, Gold, Silver, Iron, Skins, Leather, and hunting Dogs; and speaking of the *Cassiterides* he adds, *Tin* and *Lead*. *Tacitus* joins *Pearls*. *Cesar* mentions neither Gold, Silver, nor Pearls: *Cicero* affirms in express terms, from the Information of the Letters of his Brother *Quintus*, that there was neither Gold nor Silver in *England*, which shews that the *English* Metals were not then known.

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*On the 5th Year current, August 26. in the Afternoon, as Dr. Haly has demonstrated.*

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*Strabo lib. 4.*  
*Tacitus vita Agricola* cap. 12.  
*Cicero Epist. fam. lib. 7. ad Trebat. Epist. ad Atticum lib. 4. Epist. 17 & 116.*
Weights and Measures, &c.

known to the Romans, but were so very soon afterwards; for Strabo, who talks of their Tin and Lead Trade, lived under Augustus and Tiberius. There was either no Copper, or not a sufficient Quantity in England at that time, because they were furnished with that Metal from abroad. Lead and Tin were used in the time of the Trojan War, and brought perhaps from the Cassiterides by the Phoenicians. "Herodotus affirms that the Greeks had their Tin from thence. As for English Dogs they were brought to Rome before Caesar's Expedition: they are mentioned by Gratian in his Cynogeticon, and by Strabo as of common use. It has been doubted whether the Britons at that time had any other Shipping, except their small Boats covered with Leather; but since Caesar tells us that they often assisted the Gauls, and particularly the Veneta, we must imagine they had larger Vessels built of solid Wood; besides they must needs imitate the Fabrick of other Ships, which they saw in their own or foreign Ports every day.

The chief trading City among the Gauls was Massilia (now Marseilles) founded and peopled by the Phoceans, an Asiatic Nation addicted to Commerce, whose Manners they retained; they civilized the Gauls, who were their Neighbours; but their Riches and Grandeur drew upon them the Envy and Hatred of some Nations among them, as the Salyans and Ligurians. They assisted the People of Rome (who courted their Favour) on many occasions. There are two Voyages of the Massilians recorded; one of Euthemenes beyond the Line; and another of Pythis towards the North as far as Iceland, which were treated, because of the Strange-ness of their Accounts, as fabulous by the Ancients; but time has confirm'd the possibility and the truth of them. Marseilles had great Obligations to Pompey, and join'd with him against Caesar, who took their City after the Loss of two Sea Battles which they had sustained in their own Defence. There were other trading Towns in Gaul less famous than Marseilles, of which the Reader may see an account in Monsieur Huet.

Spain

1 Caesar. lib. 5. cap. 12. de Bell. Gall. Strabo lib. 3i
2 Herod. lib. 3. cap. 15.
Tables of Ancient Coins,

Spain (at least the Southern parts of it) was always much more famous for Traffick than Gaud. The Phenicians frequented it, especially that part which lies towards the Straits of Gibraltar at the mouth of the Betis, celebrated by ancient Authors under the name of Tharsis. See Exek. xlvii. 12.

The Expedition and Conquests of Hercules are ascrib'd to those Parts of Spain; and one Colaus of Samos is said to have been driven thither by fortune about the forty fifth Olympiad, where he made a very rich booty; tho' Sostrates, a certain Greek from the Island of Aegina, had been there before him. The Phocaeans, driven from Asia by the Persians, came into these Countries about the sixty eighth Olympiad. The Phenicians were enticed thither by the Silver Mines, called by the Ancients the Mountains of Silver: Whereof they found such Quantities, that they forged their Anchors and other Utensils of their Ships of that Metal. I have mentioned the Spanish Mines in a former Dissertation. Besides Metals, Spain furnished several other rich Commodities, as Wine, Wool, Stuffs, linen Cloth, (of which they were said to be the Inventors) Honey, Wax, Borax, Vermilion, fusible Salt, pickled Fish, and a sort of Rush called Spartium, useful for Cordage and other parts of Shipping, from whence Carthagena was called Spartania. But Oil must not have been plentiful, even in Andalusia, in those times, since Aristotle tells us that they purchased it of the Phenicians with Bars of Silver. The Inhabitants of the Balears made use of a factitious Oil, and the Portuguese instead of it used Butter. In the time of Augustus and Tiberius the Southern Coasts of Spain sent great Fleets of Merchants to Italy.

Germany was very little known before the time of Caesar; and he knew only that part of it which lies on the Banks of the Rhine. In the Wars that were carry'd on under Augustus, that Country came to be more frequented, for his Fleets sail'd round Germany beyond the Cimbrick Chersonesus (now Jutland.)

When

2 Aristotle, lib. de mirabilibus.

3 Strabo, lib. p.
Weights and Measures, &c.

When *Strabo* speaks of *Germany*, between the *Elb* and the *Baltick*, as an unknown Country, he must be understood to mean the inland places and not the Coast. *Tacitus* says that the *Germans* were *Autochthones*, Originals of their own Country, and that they had no Communication with any strange Nation; that the Transmigrations and peopling of Countries were made in former times by Sea, and not by Land; nevertheless there were several Inroads of foreign Nations into *Germany*, mentioned by ancient Authors, particularly *Voyage of the Egyptians* under the Conduct of *Osiris* up the *Danube*; from them the *Suevi* had their Worship of *Isis*, and all the *Germans* that of *Truth*, from whom they took the name of *Teutons*. According to ancient Fables the *Algonquins* at their return from *Colchis* sail'd up the *Danube*, and from thence passed into the *Adriatick*, carrying their Ship *Argo* upon their Shoulders: a Mark of great Ignorance in Geography among the Writers of that time. The manner of living of the *Nomades*, changing their Habitations, made them incapable of Trade. The Inhabitants on the Banks of the *Rhine* knew the use of *Wine* and *Money*, and taught both to their Neighbours. The Amber of the Northern Coasts of *Germany* brought a considerable Profit, that commodity being in great request at *Rome*. *Scandinavia* had Harbours both upon the *Baltick* and upon the Ocean: the Inhabitants built Vessels of a particular frame, with two Prows, and without fells, like those of some other people upon the *Euxine* Sea. They exchanged their dry *Fish* and other *Merchandizes* with those of the *Germans*; their Pitch and Copper brought them likewise considerable Profit. All the People of that Northern *Track* Eastward of *Germany*, and a part of *Germany* itself, were very indistinctly known by the Ancients under the Name of *Scythians*, of whose Commerce there is little mention; and Monsieur *Huet* speaks rather of the modern than ancient state of the Trade of *Muscovy* and *Poland*.

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* *Diodorus Siculus* lib. 1. * Capitol is Augsburg. 
* Inhabiting the Country now Schwaben, the * Capital*'s *Augsburg.* 
* Scandinavia was the Track of Land which contains now the * greatest part of Norway and Sweden.*
The Euxine Sea, is conveniently situated for Trade by the communication it has both with Asia and Europe, and the great navigable Rivers that empty themselves into it. The Danube, the Borythones, the Tanais, open it to the European Nations on the West and North, and on the Eastern Coast an Infinity of little Rivers from Mount Taurus, and its branches, brought down the Merchandise of Asia, so that it furnished many rich Commodities to the Countries which traded towards it, such as Gold and other Metals, Corn, Leather, Linen, Honey, Wax, Cattle, Furs, Drugs, as Rhubarb and Liquorish, Nuts, Timber for Ship-building, and some precious Stones. The Greeks believed themselves to be the first who had navigated that Sea, from the Story of the Argonauts; but the Egyptians had been there before them; for Sesostiris King of Egypt, following the steps of his Predecessors, marched into that Country, and was defeated at Colchis. The Greeks established a great many Colonies on the Coast of the Euxine, and in honour of Commerce erected a Temple and Statue to Mercury, which Arrian found at Trapezus or Trebizond. He mentions likewise the Port of the Asiacks, so called from Isis the Goddess of the Egyptians. The Fishery of the Euxine Sea consisting in Sturgeon, Tunny-fish, Cavear, which were exported to Italy and Greece, was so great that the Customs of them maintain'd the old Andronicus Paleologus and his Household. The old Byzantium (now Constantinople), raised a great Toll upon the Trade that passed into that Sea.

The Egyptians failed to the Cimmerian Bosporus, Palus Maotis, and the Taurick Chersonesus, unknown to the Ancients on the North side; for in Pliny's time they did not know whether the Palus Maotis were a Gulph of the Ocean. The Phœnicians traded to it, as appears by Lucian. The Fable of Iphigenia and the famous Exploits of Pylades and Orestes, demonstrate that there was a correspondence between the antient Greeks and Scythians in that Country, where they afterwards established Colonies. Theodosia an antient

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- Arrian, Peripl.
- The Cimmerian Bosporus joins the Euxine and the Palus Maotis.
- Palus Maotis, now called Mare delle Zaichische, from a sort of Fish.
- Taurick Chermonesus, between the Euxine and Palus Maotis.
- Plin. lib. 2. cap. 69.
Weights and Measures, &c.

tient Colony of the Milesians, at the Entry of the Cimmerian Bosporus, was an Harbour capable of an hundred Vessels, a Place of much Commerce, almost deserted in the time of the Emperor Adrian, afterward re-established and possessed by the Genoese, under the name of Casa, who carried on a great Trade there under the Grecian Emperors, till it was taken by the Turks... Tanais (now Asof) was built by the Greeks. k Olbia, Borythenis, Panticapeum capable to hold an hundred Vessels, Capi, Phanagoria and Harmonassa, are all Greek Colonies, and CHERSONESUS, according to Pomponius Mela, built by Diana. The Merchandise of the Taurick Chersonesus were Corn, Furrs, Butter, Horses, which the Tartars at this Day exchange with the Muscovites for other Commodities. Arrian in his Periplus of the Euxine has given us a Lift of the Ports of that Sea, which is but shallow, and does not admit of Ships of great Burthen; the Indian Goods were commonly brought hither by the Cappian Sea, into which they passed by the River Oxus. The Tartars who used to bring their Spices formerly to Casa, after the Genoese were beaten out of that Town, from the memory of so gainful a Trade, have sometimes sent the same Commodities as far as Genoa, in Ships from Casa. Their Predecessors, the Seythian Nomades, Inhabitants of the Country beyond the Palus Maetis, had no Commerce nor certain Abode, neither Corn nor Tillage, but lived on Milk and Horse Flesh.

Before we speak of the Commerce of Italy in the time of Augustus, the Reader must understand that the Tyrrhenians, even before the Reign of Minos, had settled themselves in Italy; they gave their name to the Tyrrhenian Sea; the Seat of their Empire was the Port of Luna: the Tarentines, Spinets, and Liburnians were likewise famous for their Navigation on those Seas. The Romans made war upon the Tarentines, and obliged them by Treaty not to sail beyond the Cape of Lacinia. Cornelius Valerius, Duumvir of the Sea, confiding in the faith of that Treaty, approached Tarentum with his

k There were three Olbias, one in Gallia Narbonensis, a second in Sardinia, and the third here mentioned. 1 It was called Chersonesus Emporium. 2 Luna, now l’Erica in Tuscany. 3 The Cape of Lacinia and that of Salentum, include the Sinus Tarentinus (Golfo di Taranto.)
Tables of Ancient Coins,

his Fleet, which the Tarentines plundered, killing their Commander, and so arm'd the Romans against them, by whom they were subdued. The Spineta, as we said before, were descendent from the Pelasgi, and settled at the Mouth of the River Po, which was called from them Spinetick. Thus the three Seas of Italy, the Inferior towards the South-East, the Italian towards the South, and the Adriatick on the North-East side, were antiently commanded by these three different Nations: the first by the Tyrrhenians, the second by the Tarentines, and the third by the Spineta. The Liburnians, who lived on the opposite Coast, that of Illyria, were great Navigators, and addicted to Pyracy; they possessed themselves of several Islands in the Adriatick, were the Inventors of a light sort of Vessels called Liburni, which came to be much in use in the time of Augustus. All those Nations were severally subdued by the Romans, who for a long time, tho' they were possessed of their Ports, did not profit much by Trade. The Books of Varro concerning Navigation are lost, which no doubt would have given us great light in those matters. The Romans tho' they had no great Genius for Trade, yet were not entirely neglectful of it. The Establishment of the Praefects Aemula was very ancient, their Business was to supply the City with Corn, which they transported at first from Sicily and Sardinia, and afterwards from Africa; under the first Emperors from Ægypt; and in the Declension of the Empire from Marseilles and Gaul. In the year of Rome 259 there was a College of Merchants instituted, called the College of Mercurials, from Mercurius the God of Commerce. We do not read of any great Improvements made in Commerce by that Society: The destruction of Carthage and Corinth did not increase the Trade of Italy so much as one would have imagined; but when those two great Cities were rebuilt, Augustus apply'd himself more seriously to Affairs of Trade and Navigation; he sent large Squadrons into the Ocean beyond the Cimbrick Promontory on the Coast of Africk towards the Line; to the Palus Maetis and the Arabick Gulph or the Red Sea. The African Trade was manag'd at Utica.
Weights and Measures, &c.

Utica. There are many Laws in the Digest, which shew that the Romans apply'd themselves to Trade. These related to privileges, as exemption from municipal Offices annexed to the Proprietors of Ships of such burthens, employed in the bringing home of Grain. Several Citizens by a fraudulent fulfilling of the Condition endeavoured to get the Benefit of the Privilege, without answering the Intention of the Law, which fraudulent practices were provided against by new Laws: The Constitution of Ships was forbidden to Senators, by a Law made by Claudius, Tribune of the people, in the time of the second Punick War, and re-enacted by the Julian Law of Concussions.

During the Triumvirate of Octavius, Antony, and Lepidus, young Pompey built a Fleet of large Ships, and good Sailors, commanded by experienced Captains, endeavouring, after the example of his Father, to pursue his Fortune at Sea; and encouraged by some Victories his Ships had obtained over those of Caesar, he called himself the Son of Neptune, and wore a sea-green Habit: He was defeated in a Sea Battel by Agrippa, who commanded Caesar's Fleet. This Engagement was on the Coasts of Sicily, with three hundred Ships on each side. Agrippa was an expert Sea Officer; but altho' his Master Octavius Caesar had no Genius or Inclination for these Expeditions, yet he honour'd his Admiral Agrippa with a naval Crown.

At last the Battle of Actium, between Antony and Caesar, gave a decisive stroke in the Command of the Sea: The different accounts that are given of the Numbers of Ships on both sides by several Authors, are reconcilable, by supposing that some spoke of the men of war only, and others added the Transports. If Plutarch's Account be true, Antony's Ships must not have been of very great bulk; for there were two thousand and twenty thousand Soldiers on board a Fleet of perhaps four hundred sail, since three hundred were taken in the Battle. Cleopatra fled with sixty, and Antony in one Quinquerenis: according to this Account there must not have been

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9 Actium is now called Cape Figalo, at the Entry of the Sinus Ambracius or Golfo di Larta.
been above fifty five fighting Men on board every Ship one with another; this Victory was obtain'd by the advantage of the Ships called Liburni, which for that reason came afterwards to be of common use. Augustus Caesar, to establish himself in the Dominion of the Seas, rigged out a powerful Navy to clear it of the Pirates of Malta, Corfu, and the Liburnians; he appointed two Stations for his Fleets, which were constantly equipp'd, one at the Cape of Misenum, in the Tyrrhenian Sea, and the other at Ravena on the Adriatic Gulf; the first had the command of all the Sea westward, and the second of the Eastern, as far as the Pulus Maotis. Ravena continued a large and capacious Harbour for a considerable time but at last the Sea left it, and it was choak'd up with slime and sand.

The Romans were now Masters of all the Trade of the world, but they were more employed in extending their Dominions than cultivating their Commerce. It is certain, whatever Strabo may allege to the contrary, that the Ancients coasted only in their Navigations, seldom taking the open Sea.

Pliny tells us that the Romans steer'd the same Course to the East-Indies, which the Fleet of Alexander did, and describes it exactly from Alexandria to the Indies; he says, the desire of gain had made the Merchants steer shorter and less dangerous Courses sometimes, by taking the open Sea, by sailing from one Cape to another, which was both a safer and shorter Course. What he says concerning the Circumnavigation of Africa, from the Straits of Gibraltar to the Red-Sea is very remarkable, and puts the matter of fact beyond doubt. This he proves from the Wrecks of Vessels, which had fail'd from the Coast of Spain, the broken pieces whereof were found in the Red-Sea. He speaks of Hanno's Journal of the same Voyage, as a thing certain; and adds upon the Credit of Cornelius Nepos, a faithful Historian, that one Eudoxius flying from Ptolomy Lathyrus, King of Egypt, embark'd on the Red-Sea, and landed at Cadiz.

1 Plin. lib. 6. cap. 23. 1 Lib. 2. cap. 67.
Weights and Measures, &c.

The Romans improv'd their Navigation by their Commerce with Nations more skilfull in those matters than themselves. Mr. Huet thinks that the custom they had of giving the colour of the Sea to the Hulks, Sails and Mariners of their Spy-boats to keep them from being discover'd, came from the Veneti, a people of Vannes in Britany, and this upon the Authority of Vegetius, and because of the Latin name of that colour Venetus. That the Romans cultivated Navigation chiefly with regard to War, is plain from "all their History. The Statue of Victory set up in the Port of Ostia, and the Medals of Marcus Censorinus, An. U. C. 630, stamp'd on the Reverse with two Ships, and a Victory, are a plain proof of it. Their Medals struck upon occasion of sending out Fleets of Victuallers, had this Legend, ad coementum Frumentum S. C. so in the time of the Emperors Annona Aug. Ceres Aug.

Nothing advanc'd the trade of the people of Rome so much as the Reduction of Aegypt into the form of a Province by Augustus. Rome drew from Aegypt immense Riches: first it was a Granary for their Provisions of Corn, which by a happy fertility they were able to furnish to other Countries, ev'n in Years of Famine. This Commerce of Grain was constant and regular to Rome under the Emperors, and afterwards to Constantinople, where it continued even to the time of the Sultans. The Sea-ports of Aegypt were Pelusium (now Damiat) toward the East, and Alexandria toward the West. The fertility of the Soil in grain, and its being not proper for Vines, put the Egyptians upon drinking Ale, of which they were the Inventors; but they afterwards planted Vines, and made excellent Wine, particularly the Moreau celebrated by Virgil, Horace and Strabo. The victualing Fleets sent to Aegypt were call'd by the Romans Sacra Embole, Felix Embole. Besides the Fertility, the Scitation render'd Aegypt a central place for the Commerce of Arabia, India, Ethiopia, Syria, and for all the Coasts of the Mediterranean and Ocean. Although the Harbours were extremely good,

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good, the difficult access to their Coast, the sandy Desarts towards the East, the defence of the Red-Sea, with the Isthmus joyning Egypt to Syria, and the Mountains towards the South, were reckon'd as Bulwarks to the Country; and so they had been, (if possesed by Inhabitants of a warlike disposition, but they were noted for the contrary Character,) rendring the Conquests of it difficult. Sesostris had join'd the Nile to the Red-Sea by a Canal, which open'd a Water-carriage to the East-Indies. And what Strabo says of Ptolemys Philadelphus being the first who made a way for the marching of an Army from Coptos to the Red-Sea, is only a Complement to a Greek. The Ships which Sesostris sent to the Indies must not have been small, he had consecrated one of 280 Cubits to the God Osiris. Lucian saw an Egyptian Ship in his time in the Peraum 120 Cubits long, 30 broad, and 29 deep. Appian in his Preface reckons the Forces by Sea and Land of Ptolemy the son of Lagus 200000 Foot, 40000 Horse, 300 Elephants, 500 Gallies, 2000 smaller Vessels, and 800 Thalamigos or Pleasure-boats of a great size.

The Government of Egypt was one of the great secrets of the politicks of Augustus; that Province was never given to a Senator, but always to a Knight, who was suppos'd not to have the ambitious aims of Senators. Germanicus was severely reprimanded by Tiberius for travelling into Egypt without his Permission.

As to the Revenues of Egypt in later times, Emalbin Author of the History of the Saracens lays, that in the year of Christ 898 the Calif drew from Egypt 300,000 Crowns of Gold.

The Trade of Egypt declin'd with the Roman Empire; grew still less under the Mamelukes, who had a Genius and Maxims quite opposite to Commerce; and at last came to be entirely lost by the navigations of the Portuguese round the Cape of Good Hope, and their Establishments in the Indies. Grand Cairo, which was built in the year of our Lord 795 out of the Ruins of the ancient Memphis, suffer'd much by the loss of their Trade on this occasion.
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occasion. There remains some part of their Linnen trade, for which they were always so famous.

The ancient City of Thebes, call'd Hecatompyle from its hundred Gates, was almost ruin'd by Cambyses, and very near desolate in the time of Strabo; but Alexandria surpassed in Riches and Trade, not only all the other Cities of Egypt, but of the whole World. Josephus describes it with great pomp, telling us that it yielded to Rome in nothing, except in bigness. Ammian Marcellinus calls it the chief of Cities. It sent many rich commodities to Rome, as Cloaths of all sorts, especially Linnen, Spices, Paper, Glass, Hemp, magnificent Robes. As it exported many, so it received some from other European Ports, which by reason of the fatness and heaviness of the ground Egypt did not produce, such as Metals, Wood, Pitch, and some Fruits. This great Trade began to decline under the Reign of Heraclius, when the Saracens made themselves masters of Egypt, but it recover'd a little again; for a Jew, one Benjamin of Navar, in his voyage made in the 12th Age, tells us that he saw there a great Trade, and resort of Merchants. And, the Indian Trade, which had been brought to Arabian by the Caspian Sea, and to Caffa by the black Sea, took once more the way of Egypt, and continued till the time of the navigation of the Portuguese to the Indies.

Ethiopia sent many rich Commodities down the Nile into Egypt, as Metals, particularly Gold. The Gold of Ophir is often mentioned in the Scriptures. Heliodorus tells us that the Ethiopians used Gold for the most common purposes; besides Gold, they had Ivory in abundance. The City of Coptos was the Magazine of all the Trade from Ethiopia by the Nile, as well as of those Commodities that came from the West by Alexandria. The Navigation of the Arabick Gulf being more dangerous towards the bottom, than the mouth, Ptolomy Philadelphus built Berenice, (so called from his Mother) at the entry of the Gulf, in the Country of

the Troglodites, to receive the goods from Coptos. It had near that
City the port of Myos-bormos, the harbour of Mice, and now call'd
Cafir. Aduli, according to Pliny, in the country of the Troglodites
(a part of Ethiopia) was a place of great Trade. Strabo tells you
that in his time they sent Fleets out of the Red-Sea to the extre-
mities of Ethiopia, and imported quantities of precious goods
from thence. These considerations induc'd Augustus, when he sent
Aelius Gallus into Arabia, to extend his commissiion to Ethiopia,
and the Trogloditeck, apprehending likewise that it was in the
power of the Ethiopians to change or at least spoil the course of the
Nile. Elmacin in his History of the Saracens, tells us that in the
time of Mustancer, Calif of Egypt, the waters of the Nile being
very low, and consequently Egypt threaten'd with a famine, that
Prince sent Michael Patriarch of the Jacobites with great presents
to the King of Ethiopia, with a requesst, that he would open the
Sluces of the Nile; which being granted, the Nile rose three cubits
in one night. John Cantacuzene, who quitted the Empire of Con-
stantinople for a monastery, tells us in the History of his Reign,
that the Sultan of Egypt endeav'ur'd to keep a good correspon-
dence with the Jacobites who were established towards the head of
the Nile, for fear they should take a fancy to turn the course of that
River. The famous Portuguese Alphonso d'Albuquerque had the same
extravagant fancy to turn the course of the Nile into the Red-Sea,
to revenge himself of the Sultan of Egypt who interrupted his
trade to the East-Indies.

Arabia was a Country of great Commerce in the time of the
Romans. Aden before-mention'd had in its harbour at the same
time Ships from all parts of the World. The Gerbeans and the
Mineans, ancient Inhabitants of Arabia, formerly carried their Spices
by land to the Frontiers of Palestine. Azotus, according to Pom-
ponius Mela, was the Staple Port of the Arabians upon the Medi-
terranean. There cannot be a better account of the Merchandises

a Pliny lib. 6. cap. 29.  e Strabo lib. 17.  d Pompon. Mela. lib. 7.
of Arabia, than by Moses himself who liv'd so long amongst them. The Prophecies of Psalm 71, the Presents of the Queen of Sheba to Solomon, and those of the three wise Men to our Saviour; and what Ezekiel, cap. xxvii. v. 21, 22, &c. lays of their traffick with the Tyrians in Spice, Gold and precious Stones, are all authentic accounts of the Richness of their Merchandize. The Arabians had all the qualities of the God Mercury, for they were not only addicted to Commerce, but stealing; they are naturally courageous; and it must be reckon'd amongst the most wonderful events that ever happen'd amongst mankind, that a handful of people of that country should partly by Valour, and partly by Enthusiasm, establish perhaps a greater Empire than that of Rome, and in much less time. The Conquest of that Country by Seostiris was in order to draw a Canal from the Red-Sea to the Nile. It is doubtful who began this great work, but it is certain that Ptolomy Philadelphus compleated it. This Canal had its opening at the City of Coptos. Augustus sent Aelius Gallus into Arabia, who tho' he did not conquer it, being deceived by Syllaus Intendant of the Nabatheans, yet made such an Establishment for the Romans, that in one Port, Albus Portus (White-Haven) they rais'd no less than 2½ per Cent. duty upon all commodities enter'd there. Aden, mention'd before, was afterwards called Portus Romanus.

The India Trade was ever reputed the most ancient, the most honourable, and the most considerable of any in the world; all Nations complain'd that it was expensive, yet none ever willingly quitted it. (The Reader may have observ'd what Pliny, quoted in a former Dissertation, says of it.) It having been ever the most favourite Branch of Trade to all Nations and Princes that have made any figure in the world, I hope the Reader will not be displeas'd with the following short History of it.

It is plain the ancient Egyptians had a great Commerce with the Indies, that Ptolomy Philadelphus did not begin, but restore this Trade. It is not credible that the Phoenicians, who navigated to the extremities of the western Ocean, who carried on a Land-

Gen. ii. 11, 12.
trade to Syria and Mesopotamia, and to the Frontiers of the Indies by Sea, who according to the Prophet Ezekiel, cap. xxvii. 15. had established Colonies in the Persian Gulf, call'd by their own names, Tyre and Aradus, stop't short, without pushing their Trade to the Indies. Taprobane, which was always acknowledged to be in the Indies, worshipped Hercules the God of the Phenicians; a sign that the Phenicians had been amongst them. Melas, Pliny and Capella speak of the Seres, the same people with the Chinese, as being very shy and diffident in their manner of dealing, so as neither to speak nor be seen by the strangers with whom they traded, yet as being just and honest. Time humanized them a little.

One certain sign that Commerce had been well established between the Indies and the Eastern Coast of Africk, is, that the Portuguese when they had doubled the Cape of Good Hope, found at Mozambique and Melinda skilful Pilots using Astronomical Instruments, Geographical Charts, and Compasses. Arrian in his Periphus of the Erythraean or Red-Sea, tells us that before the Egyptians had penetrated into the Indies, or the Indians come into Egypt, the Port called afterwards Arabia Felix was the Staple for the Merchandize of both Countries. The same Author describing the Persian Gulf, names two famous Ports, Apolagus and Ommanus; to which great Ships brought from the Indies Copper, Horns, precious Wood, and from whence were exported Pearls, purple Stuff, Robes, Wine, Dates, Gold, and Slaves. The Indies were very little known to the Greeks before the time of Alexander the Great. They treated the voyage of Pseudotheus to the Indies, related by Diodorus, as a Fable. Alexander himself, from a vain-glorious Spirit unworthy of him, exaggerated the Strength and Stature of the Indians, and endeavoured to impose upon Posterity, by monuments of an enormous size, that he erected in several Places. The Greeks who followed his Army, in this matter followed likewise his example. Nearchus, who commanded Alexander's Fleet, and Oneiwrates his Intendant-general of Marine, have both left relations of the State of the Indies at that time, which Strabo treats as fictitious, mixt with some truth.

1 Diodorus lib. 2. 2 Strabo lib. 17.
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truth. Pliny made an Abridgment of the Journal of Onesicrates, taken from Juba, and tells us that after the Navigation of Onesicrates, the common Course was from the Promontory of Syagros, (thought to be what we call Cape Farah) to Patalus in the mouth of the Indus; that afterwards the Course from Cape Syagros to Zigeros was found more safe and short. The Indian Fleets which carried the Roman Trade, went out in the month of July, and came back in December. We have observ'd already that Ptolomy Philadelphus restored the Indian Trade to Aegypt. Strabo reports upon the faith of Pisisenius, that in the Reign of Ptolomy Euergetes, second of that name, there was found in the Arabick Gulf a vessel with an Indian half dead in it. This Indian told them that mistaking their Course, the Crew all except himself were dead of Hunger: this Indian however served as a Guide for those whom King Ptolomy sent to the Indies. By this story it would seem, that the Indian Trade had been neglected in Aegypt for the space of 140 years. Strabo likewise tells us, that when Aelius Gallus was Gouvernor of Aegypt under the Reign of Augustus, a Fleet of Merchants from Alexandria fail'd into the Red-Sea by the Nile, that he himself saw 120 Vessels fail out of Myos-Hormos, (the Port of Mice, before mention'd) to India and Ethiopia, from whence they brought back very rich Commodities; and that under the Reigns of the Ptolomys, there were hardly twenty Ships that sail'd quite out of the Arabick Gulf. The Romans, not only from Luxury but Interest arising by the profit of this Trade, afterwards encouraged it very much; by which the Indians came to know the power of Rome, and sent Embassadors to Augustus. The Inhabitants of Taprobana in the Indies at that time were so ignorant of Navigation, that they steer'd their Course by the flight of Birds, who they reckon'd would fly to the nearest coast. Pliny tells us that this Island was discover'd under the Emperor Claudius, by a Libertus of Annias Plocamus being cast upon that coast by a Tempest. The Inhabitants, informed by this Libertus of the power of the Roman Empire, sent Embassadors to Claudius, to ask his Friend-
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...ship: these Ambassadors inform'd the Emperor of their Commerce with the Seres, a more Eastern People, whom they describ'd as gentle, but unsociable. The two Indian Merchants cast by a storm on the coast of Germany, carried first to the King of the Suevi, and presented by him to Metellus Celer, then Proconsul of Gaul, has occasion'd a great many reasonings about the Course they must have steer'd; some imagining that they might have come by the Northern Sea of Tartary through the Straits of Waigates, and so into the German Ocean. M. Huet has a short way of explaining all this matter, by supposing that the barbarous People among whom they were cast, called them by what name they pleased, taking any Nation whom they knew nothing of to be Indians. Under the Reign of the Emperor Antonine, the Roman Trade flourish'd very much, not only the Indian, but that of the Mediterranean and Western Ocean. Ammianus Marcellinus, about U. C. A.D. 194, speaks of the great Trade that was carried on in the Reign of Constantius at Batne, a City built by the ancient Macedonians, &c. of a great Fair they held there in the beginning of September, where Merchants purchased the Commodities of the Indies, and of the Country of the Seres or Chinese. Those Merchandizes were transported by Caravans through Persia, and others which came from the Persian Gulf, and were transported afterwards into the Euxine Sea, went up the Euphrates from whence the Town of Batne was not far distant. Firmus having seiz'd upon Alexandria under the Emperor Aurelian, carried on the Indian Trade, and by it no doubt acquir'd those great Riches of which Vopiscus saith he was possest'd. About this time Merchandising came to be a more honourable profession amongst the People of Quality in Rome.

There are a multitude of Cities of Trade reckon'd up by the Geographers, particularly by Ptolomy. Alfragan who lived A. D. 800, Cherif Edesbi, under the title of the Geographer of Nubia, later than Alfragan 350 years; as for the Cities in general, with or without Commerce, if we believe Strabo, Pliny and Plutarch, there are about 5000 only in that part of India which was conquer'd by Alexander.
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Benjamin of Navarre, a few mention'd before, has wrote a relation of his voyage, which contains several curious things intermixed with some Falshoods. Marcus Paulus a Venetian says that in his time, about the 13th Age, the Commerce on the Coast of Malabar was very inconsiderable. Mario Sanudo a Venetian, who lived about the 14th Age, a Man full of zeal for the recovery of the Holy Land, and the destruction of the Sultan of Egypt, tells us, that the greatest part of his Revenues arose from the Trade of Spice and other Indian Goods. He names the two principal Ports in the Indies, Malabar and Cambaya; that the Customs paid to the Sultan were about the third of the value of the Goods; he would have been more surprized at the customs of India Goods in our time; he observes that the Spices brought by Land-carriage were much better than those which came to Egypt by Sea. In the History of the Moluccas, there is mention made of a Venetian Ship seen in the Eastern Seas, bound from Manilla to China, which consequently must have doubled the Cape of Good Hope.

Smarcanda the Capital City of Transoxiana, the Maracanda of the Ancients, situated beyond the Oxus, was formerly a famous place of Traffick, where the Chinese, Tartar, Persian and Indian Merchants resorted. This City was the Seat of the Empire of Tamerlane. The Turkish Conquests, and the Trade of the Portuguese, have diminished the Commerce of that place. Smarcanda had eclipsed Bogor or Bokara, which was not far distant from it, situated on the North of the River Oxus, in 39 degrees of Northern Latitude; it was formerly the Capital City of all that Country, and is now in the possession of the Usbecks; there is a description of it by Anthony Jenkinson in Hakluyt's Collection; it was possessed of great Trade, and the native Place of Avicenna, as Hera was that of Mircond Author of the Oriental History wrote in the Persian Tongue. Hera is one of the chief Cities of Chorasan, famous for the Industry of the Inhabitants, and great resort of Merchants. Canjachur, an ancient and populous City situated in the Province of the same name, was formerly the Repository of the Indian and Persian
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Persian Goods, but the Commerce of it is weakened since the Navigation of the Cape of Good Hope. Cabul, Capital of a Province of the same Name, was a famous place for the Spice Trade; the Inhabitants of that Country are called by Ptolomy *Cabolita; it was formerly the Seat of some Indian Kings: But no Country exceeded the Taprobana of the Ancients, called by the Nubian Geographer Sarandib, Serlandive in Teixera, and Serandino, and the People Serandini; according to †Ammianus Marcellinus, its Trade consisted in Pearls, precious Stones, Cinammon, Musk, Civet, Silk, and Ivory.

The Geography of the extremities of the Indies was little known to the Ancients. They were inhabited, according to their Accounts, by three different Nations, the Eastern Scythians, the Seres, and the Sina. The Eastern Scythians are now the Tartars Northward of China. The Seres, Inhabitants of the Northern parts of China; and the Sina Inhabitants of the Southern. The oriental Scythia or Cathay, Caracashay or Black Cathay, is that Country which the Arabian Geographers and the Scriptures call Gog and Magog. The Oriental people in general went almost all by the name of Seres among the Ancients. They were famous for their Justice in Commerce, but extreme shyness to strangers. They exposed their Goods with the Price mark'd upon them, then retir'd; the Merchants came, left the price which they would give upon the Goods, and likewise retir'd: the Seres returning, carried off either their Goods or the Money as they liked best. Eutropius, who relates this, adds, upon the faith of Herodotus, that the Carthaginians traded after the same manner with some people beyond Hercules's Pillars. The Seres were famous among the Ancients for their Manufacture of Silk. Under the name of Sine or Thina the Ancients comprehended not only the Southern Chinos, but the Inhabitants of Tanquin, Cochinchina, Pegu and Siam. The Sine or ancient Chinos were not so unsociable as the Seres; they were great Navigators, and much addicted to Trade: They owned the Indians as their Masters.

* Ptol. Afir cap. 18. † Amm. Marcel. lib. 22.
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Sages in Arts and Sciences. Confutius himself acknowledges that he learned his Philosophy from the Brahmins; and both the Indian and Chinese Erudition came from the Egyptians. Arrian, in his Periplos of the Erythrean or Red Sea, has set down the principal Merchandize that came from the Indies, which are some of the same brought at this day. Before the time of Augustus the common course to the East-Indies was by the Red Sea, of which Navigation Pliny gives a very exact Description. It does not appear that the ancient Geographers had any notion of the Courses which the moderns have tried by the Strait of Malacca and Nova Zembla. The Ancients had strange opinions concerning the Geography of the Northern part of Asia, they believed that the Caspian Sea was a Gulph of the Scythian or Northern Ocean of Asia, that those two Seas were join'd by a Channel large enough for the Passage of Ships, and this after a plain Testimony of Herodotus to the contrary.

It is probable that there was some Commerce by Land between the Northern part of Asia and Europe anciently as well as now, between Moscovy and China. There was an old Road to China by Smarronda, mention'd before, situated beyond Oxus, by which River Smarronda carried on its Trade to the West over the Caspian Sea, and from thence up the Volga to the Northern Countries of Europe. If one considers that passage, it seems possible to go generally by Water-carriage from China to Spain without entering into the Ocean, viz. from the East by the Oxus, the Caspian Sea, the Volga, which might be join'd to the Tanais by a Canal of six German Leagues, then by the Tanais entering into the Euxine, and from thence to the Straits of Gibraltar. Strabo points a shorter Road still by the Caspian Sea, viz. turning towards Albania, and ascending up the River Cyrus. Seleucus Nicator, according to Pliny, had devis'd a way to join Asia to Europe, and the Caspian Sea to the Euxine by a Canal from the Commerson Bosphorus to the Cappadocian. Time has much changed the disposition of those places, and the Oxus is almost drain'd by Channels which the neighbouring Inhabitants have made for watering their Grounds.

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The passage by Cabul stretched Southward by a neighbouring River, which fell into the Indus, and from thence into the Indian Ocean. The Commerce between Persia and India went by Candchar, called so from Alexander who built it, or more probably from the Candarians, a people near it. That Road is unfrequent since the Commerce between Persia and India by Sea. The Caravans of Ispahan and Agra go still by the way of Candchar, as likewise the Trade of Mingrelia the antient Colchis.

But, to return from this Digression: The Roman Trade flourished much under the time of Augustus, but was not improved under Tiberius. History only acquaints us that his Fleet went up the Elbe, he having carried his Arms as far as the Banks of that River. Caligula, an extravagant Prince, prepared himself a Triumph for an imaginary Conquest of Britain, and carried some of his Gallies by Land to Rome, for an Expedition that ended in gathering Shells upon the Sea-shore. He equip'd afterwards some Ships neither for Trade nor War, but in order to fly out of Italy, upon the News of a Revolt in Germany. He was so far from benefitting Trade, that he did it a great Injury, and brought Rome in danger of a Famine, whilst he collected from all parts an infinite number of Ships for the Construction of some great Work between Baiae and Puzzola. * Suetonius faith that Drusus, the Father of the Emperor Claudius, was the first who navigated the Northern Ocean, which is not true; for Augustus had sent Ships there before, as *Pliny tells us. And Velleius Paterculus mentions a Fleet that sailed up the Elbe, when Tiberius the Brother of Drusus commanded in these Quarters, which Fleet came back laden with all sorts of Merchandize. It was Drusus who join'd the Rhine to the Ijssel, by a Ditch from him called fossa Drusiana.

The Emperor Claudius was the first after Julius Caesar, who invaded Britain: his Fleet is celebrated by Seneca the tragick Poet. Pliny writes, that in his triumphing over Britain he enter'd the Adriatick in a Ship of an enormousBulk. He conquered a part of

*a Sueton. in Claud.  
* Plin lib. 2. cap. 67.  
b Seneca Oedav. Act. 14
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of England, and the Orcades, and left the surname of Britannicus to his Son. Vespasian, under his command, subdued the Isle of Wight. He was so great an Encourager of Commerce, that he charged himself with all the Sea-risque of such Vessels as carried Corn to Rome in the Winter time: He augmented and repaired the Port of Ostia, built a Pharos or Light House, whereof the Foundation was the Ship of Caligula before mentioned, which brought the great Obelisk from Egypt: It was under the Reign of Claudius that Corbulo join'd the Rhine to the Meuse by a Canal twenty three Miles long. Nero never thought of the Sea, but as a means to escape into Egypt when his Affairs grew desperate. Britain under his Reign had like to have thaken off the Roman Yoke. The apprehension of Nero's Jealousy made Antistius Vetus lay aside his Design of joining the Rhine and the Mofell by a Canal. Galba, Otho and Vitellius, Nero's Successors, had hardly time enough to settle in their Government, and less to enrich themselves by Trade. Vespasian coming from the East to take Possession of the Empire, thought it of the utmost Importance for his Design to seize upon Alexandria, as the Key of Egypt and the Magazine of Rome. He sent Agricola into Britain, who almost subdued it, and govern'd it with great Prudence. Tacitus ascribes to Agricola the Discovery of the Orcades, and Thule, which that Author distinguishes from the Orcades, telling us that Agricola subdued the Orcades, but only discover'd Thule. He is mistaken in both; for other Historians ascribe the Conquest of the Orcades to the Emperor Claudius; and Pomponius, who lived in his Reign, reckons their number. Thule was known in the time of Ptolomy Philadelphus, since Pythias of Marseilles, who lived in his time, had made a Description of it, which is cited by Strabo.

It does not appear that there were any new Discoveries made in Trade under the Emperors Titus, Domitian, and Nerva; but Trajan, a Prince ambitious of Glory, descended to the Mouths of the Tigris and Euphrates, and went upon the Ocean, where having seen a Vessel trading to the Indies, he had thoughts of outdo-

* After An. Dom. 100.
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...ing Alexander by the Conquest of those Countries, but wisely gave over the Project by the reflection of the difficulty of preserving such distant Provinces. The Pharos of Caieta and the Port of Terracina were repaired by the care of the Emperor Antoninus Pius. He, after the manner of Augustus, inforced the observation of the naval Laws of the Rhodians. There is mention made, in a Decision of the Jurisconsultus Favolemus, who lived under the Reign of that Emperor, of a Britamick Fleet commanded by Seius Saturninus, called their Archigovernus, which perhaps had been established for the Commerce of that Country, and to keep them in Subjection. His Successor Antoninus Philoponus was a great Encourager of Trade, for the Beneft of which he took care of the repairation of the Highways. He put off the representation of Pantocromes till late Hours, on Market Days; and Aristides the Orator his contemporary affirms Trafick to have flourished very much in his time, both in the Mediterranean and in the Ocean. The Emperor Pertinax applied himself in his Youth to a gainful Trade practised by his Father, who judging him fit for a better employment had a mind to turn his Education another way; the Son was obstinate in pursuing so profitable a Trade (which was a sort of Merchandize of Wood) by which he acquired the name of Pertinax. He carried the same genius for Trade into the Government, but executed it by Ministers. The Emperor Severus was very intent upon procuring plenty in Rome, and sending peace in all the Provinces of the Empire, particularly in Britain, having cast an Incurtainment from one Sea to the other, which separated the barrens from the fruitful part of the Island. It was with a View to Commerce that in returning from his Expedition against the Parthians he passed through Egypt, informing himself particularly of the Advantages which Rome might draw from that Country. Albeit his Son Constantine travelled through the same Country, and seemingly upon the same Motives, yet Revenge appears to have been the cause of the great Misfortune which he made at Alexandria; wherein nevertheless he had so much regard to the Merchants, that he left them in Security.
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Security. Alexander Severus, a sage and virtuous Prince, encouraged Trade at Rome itself, by moderating the Customs. This Emperor seems to have been the first who incorporated the several Trades of Rome into Companies with their particular Privileges; assigning them Protectors out of their own Companies, and Judges to decide their Suits. Maximinus traded himself with the Goths in the Produce of his own Estate in Thracia, the Place of his Nativity, whether he retired to withdraw from the unjust Domination of Optius Macrinus. The Emperor Aurelian considered the Importance of the Egyptian Trade, regulated the Prices of Commodities which came from that Country, as well Indian as native; and to facilitate the Transportation, he took care of the Navigation of the Nile and the Tiber; and to make the common people feel plenty, he increased the Weight of Bread without augmenting the Price.

The barbarous People of the North being sensible how necessary a naval Power was to carry on their Designs, endeavoured in this to imitate the Romans. The Goths, when they attacked the Empire first with an Army of 32,000 Men, had a Fleet of 1,000 Ships (Zosimus saith 5,000) built at the Mouth of the River in the Black Sea; which were most part destroyed in the Archipelago by Peace or War. The Arabs, under the Empire of Constans, appeared in the Mediterranean with a Fleet of 1,700 Sail.

Eurinus, who seiz'd upon Egypt in the Reign of Aurelian (by whom he was vanquished) was so far praise-worthy, that he encouraged Trade, and particularly the Indian, very much in that Country. Saturninus in the same Enterprise had the same fate. The Historians of that time quote a Letter of the Emperor Hadrian, wherein he renews the principal Manufactures of Egypt to be Glass, Paper, and Linen Cloth.

The Emperor Probus, equal in merit to any of his Predecessors, had the peace of the Empire very much at heart. He had a mind to divert the Labour and Industry of his Subjects from War to Agriculture.
Agriculture and Trade; and in pursuance of that design, employed his Army always in some useful Work. What was so profitable to the Empire became fatal to the Emperor, by a Conspiracy of the Soldiers, who were impatient of this fatigue, and could not bear the Restoration of ancient Discipline. He enlarged the Channels of Rivers, and particularly of the Nile, to make them more commodious for Navigation. The Commerce of Rome must have suffered under the Empire of Diocletian, by the Revolt of the Britons, begun by Carausius, and continued by Aleclitus. Carausius had been entrusted with the Britannick Fleet, to repress the Pyracies of the Franks and Saxons in the Channel; he acquitted himself like a valiant, but not like an honest Man; for he converted the Prizes to his own use. He afterwards usurped the Title of Emperor, invaded England, and was kill’d by his Associate Aleclitus. The Trade of Rome had like to have suffered another great Stroke by an Insurrection in Egypt, excited by Achilles: But he was kill’d, and Diocletian re-established Commerce in that Country. About this time the Saxons began to be known to the Romans, by the Pyracies and Ravages they made on the Coasts of Gaul and England, and their peopling some part of the same Coasts. The Affairs of Religion and War took up the Emperor Constantine so much, that he had not Time to think of Trade, in which the Foundation of Constantinople made a very great Revolution; the Vessels of Alexandria carried now their Goods thither, as they did formerly to Rome. This new Capital was peopled at the Expence of Italy, which this new Plantation exhausted. Constantinople, by its Situation, naturally invited the Emperors to think of Trade: accordingly we find in the Theodosian and Justinian Code the Interest of Trade very well provided for. After this the Incurions of the Goths and some other barbarous Northern Nations, so disordered the Affairs of the Roman Empire, that they thought rather of their own Preservation, than of enriching themselves by Commerce. After the Goths, the Arabsians, Disciples of Mahomet, erected a new Empire more formidable to the Romans than the Power of the Goths:

The
Weights and Measures, &c.

The Egyptians, weary of the Roman Government, submitted to the Saracens; and the City Cairo was built Anno Dom. 984, which proved a Rival to Constantinople in Trade; notwithstanding Constantinople, under the protection, and by the advantage of an happy situation, carried still on a great Trade. Benjamin of Navarre, a few above-mentioned, tells us he saw a great Concourse of Merchants from all Parts of the World there; this was near the twelfth Century; about this time Bagdad in Persia being situated near the Frontiers of the Indies came to be a place of great Commerce, the Indian Goods being carried from thence to Constantinople. The Greeks and Latins being mightily delighted with the taste of Cloves, made some of the Greek Emperors have a mind to conquer the Country where they grew.

Syracuse and Saladine his Son having extinguished the Caliphate of the Saracens, established the Government of the Mamelucks in Egypt, and renewed the Indian Trade in that Country; the Militia of the Mamelucks depended upon Traffick for young Boys, which they purchased in Circassia and the other Provinces of Colchis about the Pallas Meotis, and several other places of that Country; this obliged the Sultans of Egypt to treat with the Emperors of Constantinople for a permission to send a few Ships into the Black-Sea, for that Trade.

There were many excellent Laws made for the encouragement of Trade by the Grecian Emperors, but the Emperor Constans was he that signalized himself most in this particular; he declared himself Protector of the Mariners, he defended them from vexatious Suits, exempted them from publick Offices and Taxes, and granted them many other privileges. He was seconded in this by Julian, who had then only the Title of Caesar; by his care the Commerce of England, almost ruin’d by the Pycaries of the Barbarians, was re-established; he repaired and augmented the number of vessels that carried Corn from England to Gaul.

The Romans were reduced to the last extremity by the eruption of the Goths, and the taking of their City by Alarick. Amongst several
several Tyrants that aspired to the Government at the same time, there was one Attalus, who endeavored to starve Italy by stopping their Convoy of Provisions from Africa; he sail’d towards the Coast with a Fleet of 3700 Vessels of all kinds; his naval Preparations were not more surprizing than his quick and thankless Retreat; for he returned to Carthage with only one Ship, having fled without landing in Italy, or striking one Stroke.

A.D. 468.

The Emperor Leo rigg’d out a Fleet of 1100 Sail, which bid fair for re-establishing the Roman Power at Sea, had it not been burnt by Genfrick upon the Coast of Africa, by the Treachery of Basilisk the Emperor’s General and Brother-in-law.

The Roman Fleets, during their Commerce and Command at Sea, had their several Stations and Departments; the most considerable was the Alexandrian Fleet, under which was compris’d the Shipping on the Red-Sea; the second was the African Fleet, for supplying Rome, and afterwards Constantinople, with Corn; the third was the Eastern Fleet, the principal Station of which was at Seleucia, a City of Syria on the River Orontes. This Fleet had several other lesser Squadrons depending on it. They had a fourth Fleet of forty Sail in the Euxine Sea. There is a fifth Fleet mention’d in the Code, appointed for the Guard of the Treasures. It does not appear that they had any particular Fleet for the Spanish Trade.

Rome could not maintain it’s Dominion over so many Provinces without Squadrons ready equipt in the great Rivers of the Empire, which are set down in the Notitia Imperii.

The Emperors gave a very special protection to all Mariners employ’d in the Service of the Government. The fifth Title of the thirteenth Book of the Theodosian Code regards their interest only. The ninth Law of that Title protects them not only from personal injuries, but all sorts of violences and concussions ordinary and extraordinary, Inconveniencies, Inquietudes; and decrees that they should enjoy a full security. This Law was insert’d in the Justinian Code. It was provided by another Law under pain of
Weights and Measures, &c.

of death, that none should divert the ships of seafaring people against their will, nor other uses than those for which they were appointed. These were other laws of the Emperors Gratian, Valentinian, and Theodosius, confirming those privileges for ever, and forbidding all judges and magistrates under pain of death to give them the least disturbance. The Emperors Valentinian, Theodosius and Arcadius exempted them from all taxes, to which at the same time they subjected merchants without any exception. It has been observed before that the Roman laws gave particular exemptions to such as built ships, or traded in corn; they were raised to the dignity of knights by Constantine and Julian; and by another law of Valens and Gratian, a senator might be admitted into the company of mariners. As they were honoured and protected by great privileges, so their lands were in the nature of fiefs, for which the possessors were obliged to do personal service at sea. That obligation upon the lands did not prescribe or come into dispute, but by fifty consecutive years of exemption. They were bound so strictly to those personal services, that they could not take the goods of private persons abroad till the government was first served. There were laws by which they were obliged to keep ships of an useful size. The government on pressing occasions could command the service of the vessels of private proprietors, as well as their own.

The ancient Nundinae, or fairs of Rome, were kept every ninth day, which custom continued under the Emperors. Afterwards the same privileges were granted to the country markets, which was at first under the power of the consuls. For the emperor Claudius was obliged to ask the privilege of a market for some of his own grounds, from the consuls. This power was at last lodged in the hands of the Emperors.

This is a short history of navigation before the invention of the needle; when and by whom that discovery and improvement was made, is somewhat uncertain; it is older than some people have
have imagin'd. Mr. Pasquier in his most excellent Book des Re-
cherches de la France; lib. 4. cap. 35. has proved the Compass to
have been in use in the time of St. Lewis, who came to the
Crown An. Dom. 1226. He quotes some verses of Hugues de Ber-
cy, who liv'd in the time of St. Lewis; which, because they give
an ample description of it, I have set down. They are in his Bible
Fuyot.

After he has compared the Pope to the Pole-Star, he goes on,

Mais ceste essoile ne se muet,
Un Art font qui menter ne peut
Par vertu de la Mariniere
Un Pierre, Laide, & Noiriere,
Ou le fer, volontiers se joint,
Et si regardent le droit point
Puis que l'aiguille l'a touchie
Et en un festu l'ont ficchie,
En lieu le mettent sans plus,
Et li festus le tient dessus:
Puis se tourne, la pointe toute
Contre l'essoile, si sans doute
Que Jasper rien ny faussera
Ne Maroniers, n'en doubtera.
Quand la nuit est obscure & brune,
Qu'on ne voit Essoile, ne Lune,
Lors font à l'aiguille allumer,
Puis ne peuvent ils s'égarer:
Contre l'essoile va la pointe,
Perce font li Maroniers comte
De la droitte voye tenir:
C'est un ars qui ne peut mentir:
Là prennent la forme, & le molle,
Que ceste Essoile ne se crolle,
Weights and Measures, &c.

Moult est l'estoille belle, & claire:
Tel deurroit estre le Sainte Pere,
Clercs deurroit estre, & estable.

There Bercy calls the Loadstone the Mariner's Stone, as the principal instrument for steering their Course. That an iron Needle being touch'd with this Loadstone turns towards the Pole-Star, so that Mariners in the darkest night by the help of a Candle, having fitted their Compass, can judge of their Course. There is a Particularity curious enough in their Compass, which was thus, they join'd three or four straws one above another, and fix'd the Needle upon them, and letting them swim in water, mark'd where the Needle turn'd.
A Dissertation

Concerning the Doses of Medicines given by Ancient Physicians.

The knowledge of the value of ancient weights and measures is very necessary for the right understanding of the writings of the ancient physicians, and I hope it will not be unacceptable to the students of the profession, if I give a few instances of the use of the tables in computations of this kind: at the same time I hope they will excuse the imperfections of this essay, composed in haste upon a subject that really deserves to be considered with more attention.

Hippocrates divided the Drachma (which I will suppose to be the Attick, except where he mentions another) into 6 Oboli, according to the usual manner of reckoning in Greece; and no doubt in imitation of him, Celsus divides the Denarius, which was always supposed equal to the Drachma, into 6 parts.

The learned and accurate Dr. Hooper, Bishop of Bath and Wells has observed that the physicians made their prescriptions by Drachmas, not according to the standard weight, but by the current coin of their time; he supposes indeed the Denarius to have been equal to 64 grains; according to my computation, it is only
Weights and Measures, &c.

perhaps he is in the right. There is some small difference between us in the English Weights, for he assumes a different proportion of the English Averdupois Pound to the Troy Pound, from that which is supposed in the Tables of this Book; it is allowed that the Roman Ounce is equal to the Averdupois Ounce, and consequently, the Roman Pound consisting of 12 Ounces, and the Averdupois of 16, the Roman Pound must be according to both reckonings of the Averdupois Pound, but he makes the proportion of the Averdupois Pound to the Troy Pound, 175 to 144, perhaps a more accurate proportion than mine. According to Dr. Willet, whom Sir Jonas Moor quotes as very accurate, it is only as 17 to 14, and consequently the Averdupois or Roman Ounce to the Troy Ounce is as 51 to 56; according to the Bishop, there are in the Roman Ounce 437,5 Troy Grains, according to the computation of the Tables 437; of which the seventh part, viz. the Denarius, is equal to 62 1/3. The English Physicians make use of Troy Weight after the following manner:

<table>
<thead>
<tr>
<th>Grains</th>
<th>Scruple</th>
<th>Drachm</th>
<th>Ounce</th>
<th>Pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>60</td>
<td>3</td>
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<td>8</td>
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<tr>
<td>480</td>
<td>24</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5760</td>
<td>288</td>
<td>96</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

The Paris Pound consists of 16 Ounces, of which the Ounce is equal to 472,5 English Troy Grains. The Physicians reckon to their Pound 12 of those Ounces, consequently their medical Pound is equal to 5670 Troy Grains, and less than ours by 90 Grains; and their Ounce less by 7 1/2, and their Drachm, which is the eighth part of their Ounce, is less than ours by 1/4 of a Grain. But they reckoning 576 Grains in their Ounce, makes still a greater difference in the quantity of the Grain, for 105 of our Grains make 128 of theirs. This short account of the French medical Weights,
Tables of Ancient Coins,

Weights, (tho' they are not ancient,) is not foreign to our purpose. See Bishop Hooper's Treatise of Weights and Measures.

In the following computation of the Doses of ancient Medicines, I shall make use of the Weight of the Denarius and Drachma as Coins, both supposed equal to 62 T Troy Grains. The sixth part of this, or the Obolus Atticus, and likewise the sixth of the Denarius used by Celsus, is equal very near to 10 4 Grains. Sometimes Hippocrates mentions the Aeginean Weight, which is bigger than the Attick in the proportion of five to three.

I shall begin with a short account of Hippocrates's manner of prescribing, who indeed very seldom mentions the Doses of his Medicines: perhaps because they were commonly prepared and administered by the Physicians themselves, or that the Sons of the Art were sufficiently instructed in these things, and the Doses were likewise to be different according to the strength and other circumstances of the Patient; yet this is somewhat surprising, because his Purgative Medicines are generally very rough and strong, such as Hellebor, not only the black but the white: Elaterium or the juice of the wild Cucumber; Onidian Grains, or the Berries of the Mezerium; Peplus and Peplium, both Species of the Tythimalus or the greater Sperge. Besides those Purges, there were the Thapsia, the juice of the Hippophae, which is supposed to be a sort of Rhamnus; Coloquintida, Scammony, Magnesian Stone, Onicus a carthamus; le Clerk mentions likewise a sort of purging white Poppy as a Medicine of Hippocrates.

Those purging Medicines, as said before, are often mentioned without naming the Doses; thus in an inflammation of the Lungs, when the spitting is suppressed, he orders after the sixth, seventh or ninth day, to take white Hellebor, Thapsia, from Elaterium, of each equal parts; and to make the Patient vomit, but with a prediction of the great danger of the Patient. In a vehement pain of the head, the juice of the Thapsia in warm water for a Vomit, without mentioning the Dose.
Weights and Measures, &c.

He orders Scammony in bilious cases, Hellebor in defluxions of the Head, white Hellebor in a Drop; but when he mentions Hellebor without any addition, it is to be understood of the black Hellebor. He orders Cummin, and Carrot Seeds or Seseli to be mixt with Hellebor, but with the Peplum the juice of the Lasar, or Assa fatida.

In some places, he mentions the Doses particularly of Elaterium, which he orders in a woman's case, the weight of an Attick Obolus, which is about 10½ Grains in a Cyathus, that is somewhat more than 2 Ounces of Wine.

For the expulsion of a dead Fetus, he orders a Pugil of black Hellebor, and the quantity of a bean of Myrrh in a draught of sweet Wine. It is surprizing to see Drugs of that force ordered in so great and uncertain Doses; but when they were given for vomiting as well as purging, the ancient Physicians did not reckon this of so great importance; for they reckon'd that a greater Dose wrought quicker, and came up so much the sooner.

He gives as far as thirty Grana Cnidia, or Berries of the Mezerium. It seems by his manner of ordering outward Medicines, that the inward Doses of them were known to the Sons of the Art; for his Style often runs thus, As much of such a Drug as makes one, two, three Potions; thus in Lotions in women's cases he orders two potions of Hellebor macerated in two Cotyle or Hemina of water: a Cotyle or Hemina is a little more than our half pint of Wine-measure. For the same purpose he orders sixty Grana Cnidia, or Mezerium Berries macerated in Oyl and Honey, by which it would seem that thirty of them was an inward Dose.

For the same purpose, one Dose or Potion of the Oneorus (a Remedy taken likewise from Mezerium) macerated in an Æginaean Hemina of Hydromel, or Honey and Water. The Æginaean Hemina must be according to the proportion of the Talent, larger than our half pint, or about ¼ of a Pint.

Immediately afterwards he orders for the same purpose one Potion of Scammony, macerated in Hydromel, or an Attick Hemina of

e Lib. de Superfetatione.  

De natura muliebr.
of Raisin-water; where the change of the Measure is very remarkable, and it seems very unaccountable to be so exact in the quantity of liquor, where a small error was of little concern, and so be so loose in the Doses of powerful Medicines. If I were allowed to guess at the reason of this proceeding, I should believe that the Medicines being prepared by the Physicians themselves, and the lotions or fomentations by the Nurses; he thought it was much more necessary to be exact with the one than the other; and you will find through his whole Writings that he is very precise and exact in ordering alimentary things; and likewise it is not improbable, but that he concealed the Doses of his Medicines from all others but the Sons of the Art.

He is very nice in distinguishing the different qualities of his Purges; he tells you that Hallicbor is a better Purge than the Peprium, but the Peplium was better against Wind. He seems to have been the first, who divided Purges into Hydriacks, Purgers of Bile, &c.

I think there is one sort of Remedy which he uses in Drop-sies, viz. the water of the Hydriacks, which he faith is a Remedy for the Disease.

There is mention made of μέλανα or Manno, not as a purging Medicine; it is applied externally.

The next thing of which the Doses ought to be nicely determined are Opiats, but tho' he speaks of such Medicines as procure Sleep, and ease Pain, he doth not determine their Doses; he names the μέθυκον, and μεθωίκον, by which he understands the Poppy and the juice of it. He speaks both of the white and the black Poppy as astringents, but faith the black Poppy, or that with the black seed, excels most in that quality. In another place he reckons the Poppy amongst the Spices. Amongst the Opiats may be reckoned the Mandragora, Hypocremus, Henbane seed, the one he prescribes to melancholy people only with this caution, that it should not

* Lib. de internis affectionibus.  
& Lib. de  
\textit{De internis affectionibus.}  
\textit{De fo-  
\textit{natur. muliebri.}  
\textit{Lib. de ratione viétus,}  
\textit{De fo- 

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not be given in so great a Dose; as to bring madness, the other
to be taken in the measure of a Concha, which is the same with the
Oxyhaphum, above; of a Pine, adding that the madness which it
induces will be taken off by Ase's Milk. He prescribes Opium and
Milk to prevent abortions, till the Patient is quick. Castorides are
another Medicine of which the Dose must be very nicely determin'd,
he prescribes them both outwardly and inwardly, five of them
in a Possety, cutting off their heads and feet, mixt with Myrrh,
Incense and Honey. 1 Three Castorides the same way prepar'd, gi-
ven in a quarter of pint of water in a Drop Sy. 2 Four of them
in a quarter of a pint of white Wine in one of the kinds of Jaun-
dice. 3 As for Clisters he specifies them as he doth his Purges,
some for purging off Pits or Phlegm, and others for purging off
Bile. In some he determines the quantity of the liquid; in oth-
ers not; as for example, one for purging off Bile is after this
manner, Of the juice of the Lasers, as much as makes one Poti-
on or Dose, half a Drachm, of Elaterium, of Colouquintida a Drachm,
these ingredients diluted with Honey, Oyl, and Sea-water in which
Dran was boiled; he gives great quantities of Salts in his Clisters,
an Acetabulum, of common Salt, or ten Drachms of Nitre.

The Lasers Succus, which he speaks of, is the same with our
Ase fatida; by reason of the great quantities sometimes prescri-
bled, a Drachm is but a very moderate Dose, to expell a dead fe-
tus: he uses a Drachm of Laseris Succus, and an Acetabulum, (which is
above three Spoonfulls) of the juice of Leek.

Another of his Clisters is composed of a Hemina of Wine, that
is above half a pint, 1 a Hemina of Oyl, and as much of Honey,
of Nitre, the bigness of a Sheep's ancle; this shews that it was kep-
in great pieces, for he often makes use of that expression to de-
termine the quantity of Nitre.

* Another Clister is thus compos'd, two Hemine of white Wine,
half a Hemina of Honey, Egyptian Nitre torrifled a Quadrant, a Hem-

1 De morbis mulierum lib. 1. 1 Ibid. 1 seciion. 0 De morbis mulierum lib. 1. *De
m De ratione vitæ, &c. 1 De intern. af- natura mulieræ. 1 De internis affectionibus.
Tables of Ancient Coins,

mina of the expressed juice of the wild Cucumber; this in an Ana-
farca. This Clister is very strong, and in our measures runs thus, 
Take of white Wine fourteen Ounces, three Drachms; of 
Honey 1 Pint, one Spoonful; of the expressed juice of the wild 
Cucumber 1 Pint, two Spoonfuls; of Egyptian Nitre three 
Ounces.

The quadrans here meant he expresses in other places to be the 
quarter of a Mina, which is somewhat less than our Pound, ta-
kling the value of the Drachm as above; the whole Liquor of the 
Clister will make above a Quart and five Spoonfuls.

9 In a Tetanus to move the belly he proceeds by this method, 
first with a Suppository of ten inches long of Honey and Bull's 
Gall, then with a Clister; that proving ineffectual, he makes use 
of a Smith's Bellows, and afterwards applies a Clister.

Q. Whether Wind might not be drawn out of the Bowels by 
a Machine contrived after the manner of an Air Pump;

Blood-letting is another subject of enquiry. Hippocrates let 
great quantities, and open'd several veins at a time; he faith that 
object should be done with broad Lancets, or as it is in the original, 
Swords, in order to make a large Orifice: from which one may 
guess that the manner of opening a vein at that time, was by 
stabbing or perfusion, as it is performed in horses. He tells you 
that in applying of Cups the Scarification ought to be made with 
crooked Instruments. He often has the expression of letting blood 
to a great quantity, without mentioning the Weight or Measure. 
He let blood often ad deliquium, till the Patient fainted. He tells 
you of one Patient in a complaint of his Bowels, who was let blood 
till he had scarce any left, and that he was perfectly cured; by 
this one would imagine his Disease had been an inflammation of 
the Bowels.

He was extremely careful in ordering the kind and quantity of 
Dyet, especially in acute Diseases; in such the Dyet which he or-
dered was a Pirifes of Barley. Pirifes properly was a Pollen, Paste,

9 De morbis lib. i. 1 De medicis lib. 9 Lib. 5. Epidemicorum.
Weights and Measures, &c.

or Jelly of boil'd Barley, which he order'd to be mixt in certain quantities of Water, allowing his Patients seldom above two Co-

* De natura muliebri. u De morbis lib. 3. x Ibid.
Tables of Ancient Coins.

'Of Ethiopia. A Cumin, of a Hemina, boil it in three Congius of Water in a Vessel closely luted, into a third part, let it be drunk cold in every kind of Fever.

The Cumin here bears a small proportion to the water, and is certainly only meant to correct the crudity of it as a Spice, so it is only a manner of giving Water in a Fever.

'A Hemina of Psitan boil'd in a Congius of Water, into one half, to the strain'd Liquor add a little Apium, let it be drunk cold.

The Psitan of Barley was prepared after this manner; the Barley was first steep'd in water till it swell'd, afterwards dried in the Sun, then beat till the husk was taken off and ground; the Meal was boil'd in Water, and expos'd to the Sun, and when dry, shut up for use.

White Raisins without the Stalks a Hemina, of Roots of Pentaphyllum bruis'd one handful, boil'd in twenty Hemina of Water into one half.

The white of four Eggs boil'd in a Congius of Water.

He recommends this Drink as cooling and laxative.
Weights and Measures, &c.

Half a Chaffin of Barley Meal, and Three quarters of a Pint of Barley Meal, a Pugil of Maid-en-hair in seven Pints of Water.

The Pulp of a ripe Cucumber without the rind in Water is recommended as an excellent Medicine both to quench Thirst and provoke Urine.

Three handfuls of Aphum, two Pugils of Pulegium, boil'd in ten Hemina of Vinegar [i.e. six Pints] into one third part, mixt with Honey, and then to be drank with Water, putting in one Pugil of Adianthus, is recommended as a Diuretick and Laxative. This is an Oxyymel to be mixt with Water.

He orders all the Liquors which are given to feverish Patients to be expos'd to the Air in a clear Night, and then to be drank cool, except by such as were inclined to a Looseness. These Decoctions are most of them to be found in his Book de internis Affectionibus.

There is one very strange draught prescribed for a short-breath'd man, and ordered to be drank off at one draught; half a Gallon of Hydromel with a little Vinegar: this seems to be prescribed by way of Exercise as well as Medicine, and it encreaseth some Suspicion that the Book de internis Affectionibus, as well as that de Affictionibus, was not writ by Hippocrates: but that is a consideration I do not enter into, because all the Books published in his name, are at least wrote by the ancient Authors.

*Hydromel and Vinegar, three Somewhat more than a Pint in bilious cates.

*De affectionibus, &c.  * De internis affection.
Tables of Ancient Coins,

There is nothing more surprizing than the great quantities in which he prescribes Milk. Asses Milk to be drank to the quantity of twelve Hemia, and if the Patient can bear it, to sixteen, that is from seven to nine Pints.

He often orders that quantity of Asses Milk boil'd to purge his Patient, particularly in Epilepsies.

He prescribes Goat's Milk to the quantity of four Hemia, or a Quart, with about ½ of a Pint of Hydromel, and the same quantity of it with ten Grains of the juice of Lacer, or Asa fistida, and some Honey, in an Hepatical Distemper.

Two Congii, or above fourteen Pints of Cow's Milk in Diseases of the Spleen. Le Clerk imagines that this quantity was not to be drank in a day; but I wonder that any man who had read Hippocrates could think so, because he has several times the word ἧξ ἐγγίζον. particularly he faith in one place, let him drink the next day eight Hemia of Asses Milk with a little Honey, and if that cannot be had, three Semicongii or eleven Pints of Goat's or Cow's Milk. And in another place he faith, let him drink the next day a Congius or seven Pints of Asses Milk.

I have often thought that our prescribing Asses Milk in such small quantities is injudicious, for undoubtedly with such as it agrees with, it would perform much greater and quicker effects in greater quantities. I take it for granted that the Patients who drank such great quantities, took no other Food.

He was very nice in the choice and quantity of his Wine, mostly white, but sometimes what he called black, in some cases sweet Wines, and in some cases auffere. Sometimes he ordered a Patient a Cup of two Hemia, or a full Pint of Wine, when going to sleep.

He prescribes sometimes very large Doses of Powders, but very effectual for the intention, such as of Sulphur, Cardamomum, Rue, Ethiopick Cummin, each the quantity of a Bean, which will make very near a Drachm, to be taken in an Asthma.

Another

* De ratione victus, &c. a Ibid. * De internis affection. * De Morbis mulier. lib. i.
Weights and Measures, &c.

Another prescribed in hard labour: 1 Of Aethiopic Cummin as much as you can hold in three Fingers, of Anniseed and Sefili as much as you can hold in five or six Fingers. I cannot tell what he means by six Fingers, unless it be to denote the different Proportions of the Ingredients. He orders in the same case the Parnon Root or Seed a Concha or about three Spoonfuls.

He is no less exact in prescribing the Exercises of his Patients, ordering some of them to walk eighty Stadia in a Day, which is about nine English Miles, which he divides after this manner, thirty Stadia in the Morning, thirty before Supper, and twenty after. I think this as necessary a Prescription as any; and if Patients would be obedient, it might do more good than all the others.

A short Account of the Prescriptions of Celsus.

Celsus was a very cautious and sparing giver of inward Medicines, he puts the strengthening of his Cure in most cases upon Diet, Bathing, Unction, Frictions, and Exercise.

He vomits often only with warm Water, and rather in the Winter than Summer, chiefly People that are bilious, and fat rather than lean; great Eaters and ill Digesters: 2 yet he gives the white Hellebor for a Vomit in one sort of Madness, and the black for a Purge in another, without naming the Dose. 3 He saith Vomits even repeated are not dangerous in Hemorrhagies. He thought Autumn the properest Season to give white Hellebor.

1 Demorbas Mulier. lib. 2 De inter. effect.
2 Lib. 1. c. 3. Vomitus utilior est hyeme quam salsate. nam rum & puitium plus, & capitis gravitas major subest. Inutilis est gracilibus, & imbecillium (lomachum, habentibus; utiles est tum excipandum dari debet. 3 Lib. 4.
Tables of Ancient Coins,

He was no great Friend to Purging and Clisters; and blames the Ancients for their too frequent use of them: You may see the Passage at large*. He was for mixing *Aloes with all Purges.

As for Opium, he seems to allow a Decoction of the Poppy or Henbane in Water, at least by quoting the Example of other Practitioners.

He condemns Blood-letting in Children, old Men, and Women with Child, but allowing at the same time many Exceptions from such a general Rule. He names several cases very pertinently, in which it was absolutely necessary to let blood; gives proper Cautions against Accidents of pricking a Tendon or Artery: As to the Quantity, he faith the Vein should be stop'd before the Patient faints; he orders bleeding from the same Vein the next Day: He gives one Precept about Bleeding which seems extraordinary, that when the Blood is good, which is to be judged by the colour, that immediately the Vein should be stop'd; but he adds, that this is a Caution which a skilful Physician does not want, because he knows the proper cases before hand.

He uses the Lactuca marina and Squils as Diuretics in Drop-sies.

I don't find he gives the second inwardly, but uses the Decoction of it as a Fomentation. He mentions several other Diuretics besides these.

He prescribes Milk in Consumptions without naming the Dose, and condemns it as a Poison in Head-aches, acute Fevers attended with Thirst, or where the Urine is bilious.

In Fevers he seems to approve raising the Sweat by cool Liquors, and tells you that after Hippocrates there was one Peter who covered up his feverish Patient with warm Cloths; and when the Fever

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*a Lib. 2 c. 12.  
*b Ibid. Sed medicamenta stomachum fere taudunt, ideoque omnibus Catharticiis Aloe mixendum est.  
*c Lib. 3 c. 18. Quidam foetum molliatur potui dando aquam in qua Papaveris aut Hyoscyamus decoctam sit.  
*d Lib. 2 c. 10.  
*e Lib. 2 c. 31.  
*f Lib. 3 c. 21.  
*g Lib. 3 c. 22. Lactuca marina, quod in capitis doloribus, & in acutis febris, & per eam facta nimia fitis, five praecordia tument, five biliosa abitu est, fave linguis suis, pro veneno ait; in phthisiis tumere, fictae in omnibus loquentes difficilissime recitantes, recte dart potavit.  
*h Lib. 3 c. 9. ---

*He intrin ex omni medicine esse.
Fever began a little to decline, gave them cold Water to drink till he provoked Sweat; if he did not sweat at first, he gave him still more cold Water till he obtain'd his purpose: When he was out of his Fever, he gave him Hog's Flesh and Wine: if he was not still quite cure'd, he purg'd him with Salt Water, and this was the whole of his Practice.

He is very precise in prescribing his Exercises and Frictions, of which he describes the natural Effects with great judgment. He prescribes from fifty Frictions to two hundred, according to the Strength of the Patient; I suppose he means so many Strokes with the rubbing Instrument.

As for the Doses of his Medicines, they seem to be reasonable, except where the Text is corrupted: for Example.

**A Confection against the Cholick.**

*Coffii, Anesi, Cassiae, singulorum P. denarios III. = dr. 3. gr. 7½.*

*Petroelimi denarios III.*

*Piperis longi & rotundi, singulorum P. II. = dr. 2. gr. 5.*

*Papaveris lacrymae, junci rotundi, Myrrha, Nardi, singulorum P. VI.* = dr. 6. gr. 15. que melle excipientur. Id autem & devorari potest, et ex aqua calida sumi.

In this the Opium is about one seventh part of the solid Ingredients.

**Against an Asthma.**

Honey, Galbanum and Turpentine mixt, the Bigness of a Bean: but there follows after that a Receipt in which the Text must be corrupted.

*Sulphuris*
Tables of Ancient Coins,

dr. 4. scr. 2. gr. 5¼.  
Abrotani pondo in vini cyatho teruntur, = Oun. 10. dr. 7. scr. 2.  
gr. 5. idque teepsactum forabetur.  
It's plain from the first Inspection that such a Quantity of either  
of the Ingredients cannot be given at once, far less out of two  
spoonful of Wine, therefore undoubtedly the numbers are omit-  
ted, and Pondo is only put at length as P. in other Receipts, and  
the * with the number wanting.

Antidotum Ambrosia nominatum, quod Zopyrus Ptele-  
maeo Regi composuit.

Costi, Thuris masculi, singulorum P. V. * = dr. 5. gr. 12.  
Piperis albi P. * = dr. 1. gr. 2¼.  
Floris Juneci rotundi P. II. * = dr. 2. gr. 5.  
Cinnamoni P. III. * = dr. 3. gr. 7¼.  
Casia nigrae P. III. * = dr. 4. gr. 10.  
Croci Cilicii P. * IIII = dr. 4. gr. 10.  
Myrrhe quam Stattem nominat P. V. * = dr. 5. gr. 12.  
Nardi Indici P. * V. = dr. 5. gr. 12.  
Que singula contrita melle colo excipiuntur: deinde ubi utendum est,  
&id quod Ægyptiæ fabæ magnitudinem impleat in potione vini diluitur.

Catapotium ad somnum accersendum.

Papaveris lachryma, Galbani, singulorum P. I.* = dr. 1. gr. 2¼.  
Myrrhe, Cistoœi, Piperis, singulorum P. II. * = dr. 2. gr. 5.  
Ex quibus quod Ervi magnitudinem habet, satis est devorasse.  
Here the Opium is one eighth part of the Ingredients.
Weights and Measures, &c. 297

Catapotium valentius ad Somnum.

Alterum stomacho pejus, ad somnun valentius, ex bis fit, Mandragora P. *, Apii feminis, item Hyosciami feminis, singulorum P. III. = * dr. 4. gr. 9¼. que ex vino terruntur.

Catapotium ad plurimos dolores, per somnum leviendos.

Silis, Acori, Rute sylvestris, feminis, singulorum P. I. * = dr. 1. gr. 2¼.
Cassorei, Cinamomi, singulorum P. II. * = dr. 2. gr. 5.
Papaveris lachrymae, Panacis, Radicis Mandragorae, Malorum aridorum, Junci rotundi Floris, singulorum P. II. * = dr. 2. gr. 5.
Piperis grana LVI. = scr. 2. gr. 2¼.

Hec per se contrita; rursus instillato subinde passo, simul omnia terruntur, donec crassitudo sordium fiat: ex eo paullum aut devoratur, aut aqua diluitur & potui datur.

The Opium is above a ninth part of the Ingredients, besides the Passum.

Passum is a Wine made of dry'd Grapes, in all appearance not after our manner of making made Wines. It was strong and sweet.

Catapotium ad inducendum somnum, quod vulva dolens prohibuit.

Croci P. II. * = dr. 2. gr. 5.
Anisi, Myrrhae, singulorum P. I. * = dr. 2. gr. 2¼.
Papaveris lachrymae, P. IIII * = dr. 4. gr. 9¼.
Cicuta feminis P. VIII. * = Oun. 1. gr. 19¼.

Q q Miscendentur
Tables of Ancient Coins,

Migcentur, excipienturque vino vetere; quod lupini magnitudinem habet in tribus cyathis aque diluitur. Id tamen in febre periculose datur.

The Opium is a fourth part of the Ingredients.

**Catapotium Athenionis ad Tussim.**

*Myrrhae, Piperis, fngulorum P. I. * = dr. 1. gr. 2;  
*Cassorei, Papaveris lacrymae, fngulorum P. I. * = dr. 1. gr. 2;  
Quae separatae contusa, posseae juxtapunguntur & ad magnitudinem fabae nostrae, bina Catapotia mane, bina noctu dormituro dantur.

The Opium is a fourth part of the Ingredients.

It is strange that the Quantity of the Dose of an Opiate should not be weighed as well as the Ingredients: it is often described by the bigness of a Bean, and there are three sorts of Beans mention'd, the Ægyptian Bean, the Roman, and the Lupine. The Ægyptian Bean must have been very small; for in the Mithridate, as describ'd by Celsus, he determines the Dose either by an Ægyptian Bean or by an Ervum, a sort of a Vetch or small Pea; besides, the Bean must have been near round, because it serves for the Model of a Pill; and it is a common Observation of Beans, the less, the rounder. The Phæsolus or Kidney Bean is commonly call'd the Roman Bean, as well as the French Bean; but if the Bean were very small in the Catapotium Athenionis, the Opium making the fourth part of the Ingredients, four such Doses in twenty four Hours would be a very large Quantity. A Dose only of four Grains would make a Grain at a time, and therefore I am apt to think that there are some Ingredients wanting in the Composition. The manner of the Ancients is to associate Opium, with other warm Ingredients.
Catapotium Heraclidis Tarentini ad Tussim & Somnum.

Croci P. I. * = dr. 1. gr. 2½.

Cinnamomi, Caesorei, Papaveris lachrymae, singulorum P. I. * =

dr. 1. gr. 2½.

Piperis longi, Costi, Galbani, singulorum P. * = dr. 1. gr. 2½.

The Opium is one eighth part of the Ingredients.

Colica Cassii Medici.

Croci, Anifi, Caesorei, singulorum P. III. * = dr. 3. gr. 7½

Petroselini P. III. * = dr. 4. gr. 10.

Piperis & longi & rotundi, singulorum P. V. * = dr. 5. gr. 12.

Papaveris lacrymae, Junici rotundi, Myrrhae, Nardi, singulorum

P. VI. * = dr. 6. gr. 14.

Quae melle excipientur: id autem & devorari potest, & ex aqua calida sumi.

The Opium is about one eighth part of the Ingredients.

Adversus difficultatem Urina.

Piperis longi, Caesorei, Myrrhae, Galbani, Papaveris lacrymae, Croci, Costi, uncia singula. = dr. 7 gr. 17½.

Styracis, Resine Terebinthae pondo sextantes = Oun. 1. dr. 6.

scr. 1. gr. 14½.

Mel Absinthii cyathus. (somewhat above two Spoonfuls.)

Ex quibus ad magnitudinem fabae Aegyptiae mane, & cœnato dari debet.

The Opium is an eleventh part of the Ingredients, besides the Honey.

Q q 2 
Some
Some Examples of the Manner of Prescribing, and Doses of Medicines, taken from Scribonius Largus.

Scribonius Largus makes use of the same Weights and Measures with Celsus. In the following Examples I shall take some Prescriptions of several kinds, following the order of the Book, and reduce them to our Weights and Measures.

A Prescription for a Snuff to be taken in a violent Head-ach.

Veratri albi, castorei, struthii, quod est radix lamaria, piperis albi, singulorum * P. I. haec contusa tenuisse forato cribro transmutatur.

R Of white Hellebor, Castor; Struthium, (which is a Root us'd by the Wool-dressers) white Peper, each one Drachm, 2½ Grains.

The Struthium is a Plant mention'd by Dioscorides, Columella, lib. XI. cap. 11. who faith that the Tarantine Sheep ought to be wash- ed with it. Pliny, lib. XXIV. cap. 11. faith that the Dyers made use of a Plant, in preparing their Wool, which the Greeks call Struthion, which he faith, lib. XXV. cap. 5. was good for Snuff. The Plant does not grow in this Country.
In Epilepsies,

Thymi albi * P. III. ex aceti syphis tribus, & mellis boni pondo uncio: ut dilatum jejunos bibat per dies quadragesimata quinque, sed quum biberit citatus ambulet millia passuum minime dudum.

R Of white Thyme three Drums seven Grains, of Vinegar seven Spoonfuls, or a quarter of a Pint and a Spoonful, and of good Honey seven Drachms, seventeen Grains: The Patient to drink this in a Morning for forty five Days, walking fast a Space, which wants an hundred and twelve paces of two English Miles.

The white Thyme is mention’d by Gaspar Bauhen Pinac. lib. VI. §. 4. he faith that it is grave olens, ill-scented or stinking.

A Collirium for an Epiphora or Inflammation of the Eyes from a watery Humour.

Aloes Indicae * P. III. Croci * P. II. Opii * P. I. Gummis * P. III. Plantaginis suci cytosis tres.

R Of Indian Aloes four Drachms ten Grains, Saffron two Drachms five Grains, Opium one Drachm 2½ Grains, Gum Arabick four Drachms ten Grains, Juice of Plantane seven Spoonfuls.

When Gummis is put by it self, it means Gum Arabick, in the Author it is often wrote Cummis with a.c.
A sharp Collirium to take Specks off the Eye, and against the Asperity of the Eye-lids.

Æris usi * P. III. Thuris Arboris Corticis * P. III. Ammoniaci Gutta * P. III. Commis * pond. IIII. Teruntur ex æqua pluviali.

Calcined Copper, the Bark of the Incense Tree, clear Gum Ammoniac, Gum Arabic, of each four Drachms ten Grains.

Galen saith that the Bark of the Thuriferus Tree is more astringent than the Incense itself.

A Remedy against Spitting of Blood and an obstinate Cough.

* Aluminis fissi P. * VI. Opii P. * I. aqua exigua Opium diluitur, miscetur alumini ante trito; sunt globuli ciceris amplitudinis: dantur jejuno ante cibum quaterni aut quini.

Of Alum six Drachms fifteen Grains, Opium one Drachm two Grains and a half. Let the Opium be dissolved in fair Water, and mix the Alum powdered, make it up in Pills of the Bigness of Chicken Peas or Vetches, and let the Patient take four or five of them in the Morning fasting.

A Remedy against an Asthma.


Live Sulphur one Drachm two Grains, of Nitre 3; 1 Grains, Southernwood as much as can be held in three Fingers. These
Quam opus est, 'dantur ex his co-
chlearia duo cum duobus cyathis a-
ceti calidi jejuno. (The libra is
to be taken away, and it must
be read *S.

Ingredients must be powdered
nicely, and two Spoonfuls of
the Medicine given in seven
Spoonfuls of warm Vinegar to
the Patient fasting.

Tho' all Authors correct this Reading as I have done, yet I
think it would be better read of a Pound than a Denarius; for
the whole Composition as it stands will hardly make two Spoonfuls.

Another Medicine for the same Purpose, which the
Author saith is good against a Palsy, Dropsy, or
Disease in the Spleen.

Bryonia, id est alba vita ra-
dicis P.*XII. Iris Illyrica P.*XII.
Ammoniacus gutta P.*XII. Aspa-
ragi radix P.*VI. Scilla bulbi
crudi ex interiore parte P.*XII.
Tragacanthi P.*VI. Mel miscet-
tur contusis & tritis donec cere
mollis habeat temperaturam. Inde
cum opus est datur P.*I. cum a-
qua mulsa cyathis tribus vel qua-
tuor.

R Of the Roots of white Bri-
ony, Illyrian Iris, Gum Ammo-
niac in clear drops, of each thir-
teen Drachms five Grains, Roots
of Asparagus six Drachms thir-
ty two Grains and an half, of
the inward part of Squill thir-
teen Drachms five Grains, or one
Ounce, five Drachms, five Grains,
Gum Tragacanth six Drachms,
three two Grains and a half,
or six Drachms, one Scruple,
twelve Grains and a half. To
these Ingredients bruised and
powdered add as much Honey
as makes the Consistence of soft
Wax. The Dose is one Drachm,
two Grains, drinking after it six
or eight Spoonfuls of Hydromel,
Seve-
Several Catapotia.

A Catapotium is a general Name for a Medicine that is swallowed solid without being dissolved, and most commonly made up in Pills.

A Catapotium for a Cough with Spitting.


R Of Saffron seven Drachms, seventeen Grains, of Myrrh double the Quantity, of Opium triple. To Myrrh bruised add the Opium dissolved in a little Water, afterwards the Saffron; after it is bruised and strained, and made up in Pills of the Bigness of a sort of Vetch, three or four of them in a Night.

What is remarkable in this Pill is, that the Opium is just one half of the Ingredients; the Pill can hardly be less than two Grains, consequently the Patient takes a Grain of Opium at a time, three or four times in a Night.

A Catapotium for a dry Cough.


R Myrrh, Peper, Castor, Galbanum, Storax, Opium, equal parts. Bruise and sift the Ca-
Weights and Measures, &c.

per contunduntur & cribrantur: deinde Myrrhae ante trite caturis contusis aque admiscuntur. Ubi omnium unitas mortario facta est, melle despumato medicamentum comprehenditur: deinde formantur pilulae viciae magnitudinis. Dan tur terne vel quaternae in noctem.

The Quantity of Opium is less in these Pills in the proportion of two to five.

Another Catapotium for an old Cough.


Styrax six Drachms fifteen Grains, Myrrh two Drachms one Scruple and sixteen Grains, (a Victoriatus is half a Denarius) Opopanax two Drachms five Grains, Illyrian Iris and Galbanum each two Drachms five Grains, Turpentine five Drachms twelve Grains and a half, Henbane seed, Nitre, white Peper and Opium each one Drachm two Grains and a half. The Iris and the Henbane Seed and the Peper must be pounded and sifted, and the Nitre powdered in a Mortar, and the rest of the Ingredients, being mixt with a Pestle, must be added to it, and made up into the Bigness of a small Bean, three or four of them to be taken in a Night.
Tables of Ancient Coins,

The following Receipts are not translated, but the Doses are marked.

Pastills or Lozenges for a Cough.

Myrrhae Trotolodytis pon. * VI, = dr. 6, gr. 15.
Croci P. * V, = dr. 5, gr. 12.
Opis P. * IV = dr. 4, gr. 9.
Thuris P. * V, = dr. 5, gr. 12.
Alterci albi semenis P. IV, = dr. 4, gr. 9.
Apollinaris herbe radicis corticos P. * IV = dr. 4, gr. 9.
Contundit hic cortex per fe, & cribratur tenui cribro: deinde Cro-
enum, postea Altercum, Myrrha, Thus, quibus misceretur Opium grise
aqua maceratum: subinde auque exiguum adjectur, donec fungi pastilli
possint pond * victoriati = half a Denarius, or scr. 1, gr. 11.

Altercuse in the Hebans, Apollinaris herba a Mandrake.

Antidotos Hiera Paccii Antiochi ad universa corporis
vitia, maxime Lateris, & ad Podagram.

Stachados, Marrubii, χαμαίδιπο, qua herba similis quyrcus folia
habet, Agarici, Cucurbitule Silvestris, quam xolonxvthia appellant,
singulorum = P. x. = dr. 10, scr. 1, gr. 4.
Opoponacis, Sagapenii, Petroselini, Terra mali, Piperis albi, singu-
lorum * P. v, = dr. 5, gr. 12.
Chnami, Nardi Spice, Myrrha, folii, Croci, singulorum * P. III.
=dr. 40, gr. 9.

In unum omnium ponderata contunduntur & cribruntur: præterea
Opoponacis & Sagapenum, hac enim mortario teruntur, adjecto meli
nuei
Weights and Measures, &c.

Terra malum is the Aristolochia. The Greek words, which are still preserved in the receipt, is a great presumption for the common opinion, that the Author wrote in Greek, tho' by his name he was a Roman by Birth. It seems the Translator was not quite sure of the meaning of some words.

Scribonius tells you that the Inventer of this Medicine got a great deal of money by it, that he did not divulge it in his own life-time, that Scribonius had found the Receipt in a Letter wrote to Tiberius, and that he never was able to procure the Receipt during the life of the said Emperor.

Against Pain and Wind in the Stomach.

Palmarum *P. XI. = dr. 11, scr. 1, gr. 7.
Anethi * pondo IV. = dr. 4, gr. 9.
Croci *P. duum, Git *P. duum, & Asari *P. duum. = dr. 2, gr. 4½.
Murti nigra baccarum *Pond. IV. = dr. 4, gr. 9.
Juniperi grana numero viginti. Contunduntur seorsum omnia, & in unum miscen tur: deinde sunt pastilli *P. I. = dr. 1, gr. 2½, or scr. 1, gr. 11. alii victoriati.
Daniur jejuno ex aquae Cyathis quatuor [about ten Spoonfuls] aut ex Cretico musfo, quod est pasti genus.

Git is the Melanthium or the Nigella, the seed of which was reckon'd as a sort of Pepper by the Ancients.
**Tables of Ancient Coins.**

Pastils to be used in a Clister, in a Disease which the Author calls a Cancer in the Bowels.

*Chara combustae cimeris* P. XXX. = Oun. 3, dr. 7, gr. 1 3 4.
*Calcis viva* pondo XXIV. = oun. 3, scr. 2, gr. 1 8 7.
*Aesivuxq, quod est Auripigmentum* P. XII. = oun. 1, dr. 4, scr. 1, gr. 9 4.
*Sundraca* P. sex. = dr. 6, gr. 24 4.

_Hae trita vino consparguntur, in quo rosa & lentes prius incoquuntur, ut possint fieri pastilli* P. duum aut unius. = dr. 2, gr. 4 4 0 or dr. 1, gr. 2 4 0.

This Receipt, if I rightly remember, is in *Marcellus*, who has copied it from the Author. *Scribonius* faith it is blamed, but only by ignorant people, because it is caustick.

**A Remedy for the Cholick.**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Oun</th>
<th>Dr.</th>
<th>Scr.</th>
<th>Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apii seminis P. jeliuam</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>5 4 1 2</td>
</tr>
<tr>
<td>Anesi P. quadrante</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2 5 6</td>
</tr>
<tr>
<td>Castorei P. sextante</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1 2 4</td>
</tr>
<tr>
<td>Myrrhe P. quadrante</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2 5 6</td>
</tr>
<tr>
<td>Spicae Nardi Indica P. sextante</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1 2 4</td>
</tr>
<tr>
<td>Opia P. quadrante</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2 5 6</td>
</tr>
<tr>
<td>Croci P. jescunciam</td>
<td>7</td>
<td>2</td>
<td>1 5 3</td>
<td></td>
</tr>
<tr>
<td>Piperis longi, pon. sextante</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1 2 4</td>
</tr>
<tr>
<td>Piperis nigri sextante semunciam</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1 0 5</td>
</tr>
<tr>
<td>Petroselini P. sextante</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1 2 4</td>
</tr>
<tr>
<td>Schoni P. jescunciam</td>
<td>7</td>
<td>2</td>
<td>1 5 3</td>
<td></td>
</tr>
</tbody>
</table>

_Hae omnia contusa cribrata, melle Attico decolle miscenetur. Datur ex hoc medicamento quantum nux Abellana media patet, ex aqve cyathis tribus calide._

I have set down in this long Receipt the true quantities reduced to our Measure, tho' the proportion of the Ingredients is sufficient
Weights and Measures, &c.

Sufficient towards the making up of the Medicine, which are set down both in the Fractions of a Roman Pound and in Integers. It was a Receipt of the famous Cassius, whom Celsus calls the most ingenious Physician of his Age. Galen has the same Receipt, but differing a little in the proportion of the Ingredients.

A Remedy against the Dropsy.

\[ \begin{align*}
Vitis albae Radicis & \times P. XX. = \text{oun. } 2, \text{ dr. } 4, \text{ scr. } 2, \text{ gr. } 9. \\
Cocci Cnidii & \times P. IV. = \text{dr. } 4, \text{ gr. } 9. \\
Scille bulbi coeci detraeta exteriore parte & \times P. X. = \text{oun. } 1, \text{ dr. } 4, \text{ scr. } 1, \text{ gr. } 9 \frac{1}{4}. \\
Myrrha & \times P. VIII. = \text{oun. } 1, \text{ gr. } 18.
\end{align*} \]

a. Cymini cyathis tribus, b. Anesi cyathis tribus, c. vini Falerni sextariis duobus, d. passi sextario uno. Prater myrrham, omnia contusa, non cribrata, macerantur passo & vino, noxie & die: postridie collatur liquor, cui myrrha trita admiscetur, a quo cyathus datus a balneo alternis diebus, singulis adiectis cyathis, donec profectus intelligatur.

The Dose is above two Spoonfuls every other day, adding as much till it has its effect.

The Medicine of Julius Bassus against the Cholick.

\[ \begin{align*}
Spicae Nardi, Costi, Piperis albi, Piperis nigri, Piperis longi, Myrrha, Opii, Aquilariae radicis, & Cinnami, Asari, Acori, Thuris, Brassicae seminis, Castorei, singulorum & P. XII. = \text{oun. } 1, \text{ dr. } 4, \text{ scr. } 1, \text{ gr. } 9 \frac{1}{2}. \\
Opoponacis & \times P. X. = \text{oun. } 1, \text{ dr. } 2, \text{ scr. } 1, \text{ gr. } 4 \frac{1}{2}. \\
Stachadis, Dauci, Amii, singulorum & P. XVIII. = \text{oun. } 2, \text{ dr. } 2, \text{ scr. } 2, \text{ gr. } 4. \\
Seselis Cretici & \times P. XXIV. = \text{oun. } 3, \text{ dr. } 0, \text{ scr. } 2, \text{ gr. } 18 \frac{1}{2}. \\
Mel Atticum miscetur, datur non plus quam & P. aut Victorii. \\
\end{align*} \]

\[ \text{Ceterum} \]

a. Seven Spoonfuls.  b. Idem.  c. two \( \frac{1}{2} \) Pints.  d. one \( \frac{1}{2} \) Pint.
Tables of Ancient Coins.

Ceterum prout exjusque vires postulabunt, dummodo infra hos pondus ex aque calde cyathis tribus [about seven Spoonfuls.] in nostrum secundum cenam. Hec potio etiam febris tantibus tuto datur: sed calicis in ipso dolore prodest.

This Julius Bassus was either Esquire of the Body, or Physician in ordinary to Nero, as appears by an old Inscription. Bassus Neronis Caesaris Corpopore Custos. Natione Frisius.

Ovilis laetis sextario, = one Pint, five Spoonfulls.
Si quis adjiciat Onici purgati * P. IV. = dr. 4, gr. 9.
Mollit & ventrem.
Quidam tribus Heminis vini = 1½ Pints.
Ut Aloes victoriati pondo, = scr. i, gr. iii.
Vel idem pondus duobus tribusvex sextariis vini [two or three pints] & ita totem per partes aquae mixtum bibunt. Videtur autem vinum vetustius, ventremque cum eo satis mollit. Facit autem Aloe per se victoriati vel * P = [scr. i, gr. iii, or double that] ex aque cyathis tribus [seven Spoonfuls] frigida vel calida perducta.

The Doses of the Aloes seem to be very small in these Infusions, yet I believe the Medicine would attain its effect in being lenitive. The Onicius or Carthamus is in quantity sufficient.

Aloes victoriati pondus = scr. i, gr. iii.
Colophonie victoriati pondus = scr. i, gr. iii.
Una terrament, adjicitur mellis quod satis est ad colligenda ea, datur ex aquae calida vel frigida cyathis quatuor [about seven Spoonfuls of Water] Hoc medicamentum stomachum non corrumpit.

Purging Pills mightily commended by the Author for being grateful to the Stomach.

Colophonie * P. VIII = oun. i, gr. 19½.
Bdellii * P. duum = dr. 2, gr. 4 ½.
Commis * P. unius = dr. 1, gr. 2 ½.

Hec
Weights and Measures, &c.

Hoc trite succo Laetueae colliguntur, & funguntur pilulae fabae magnitudinis. Dantur paribus pilulis usque ad septem, prout uniuscujus- 
cunque vives patiuntur.

Admirable Pills.

Colaphosia * P. III. = dr. 3, gr. 7 ¼.
Aloes * P. IV. = dr. 4, gr. 10.
Tragacanthi * P. dumi = dr. 2, gr. 5.

Hoc pridie aqua maceratur, posero die ceteris admiscetur. Fiunt
inde globuli fabae magnitudinis. Dantur a tribus usque ad septem,
prout uniuscujus vives patiuntur. Stomachum nullo modo vexant.

For a Swelling and Pain in the Bladder, and for
those who have difficulty in passing of Urine.

Alterci feminis, Apis feminis, malvae feminis, cucumeris edulis fe-
minus purgati, singulorum * P. VI. = dr. 6, gr. 14 ¼.
Amygdalorum dulcium purgatorum, nucleorum pinnorum purgatorum,
singulorum, * P. III. = dr. 3, gr. 7 ¼.
Opii * P. I. = dr. 1, gr. 2 ¼.
Oroci * P. unus & victoriati, passo contusa consparguntur.
Dat ur hoc medi-Medicamentum * P. I. ex passi cyathis duobus &
aque totidem. = dr. 1, scr. 1, gr. 14.

Some Examples of Prescriptions taken out of
Marcellus.

Marcellus lived under the Reigns of the Emperors Gratian and
Theodosius; he was an Empyrick, and a mere Collector of
Receipts; he often copies them without changing the very cir-
cumstantial
Tables of Ancient Coins.

cumstancial matters of fact related by the Author from whom he takes them. For example, when the Author faith he cured by such a Medicine, Marcellus faith the same thing of himself. *Describing the Remedy of Antiochus Paccius, he tells you in the very words of Scribonius that he could never get the Receipt till after the death of Tiberius, tho' he had taken great pains to discover it. But for that very reason, that he is a mere Collector and Transcriber, he is the more useful to our purpose in discovering the composition and doses of ancient Medicines, of which I shall give some Examples.

Some of the ancient Physicians are not very particular and exact in the Doses of their purging Medicines, at least in their Writings. I hope Marcellus in some measure supplies this defect in his thirtieth Chapter, where he speaks of all Medicines of that kind.

First of Lenitives.

Mollit alvum, Nitri * semissis, = scr. 1, gr. 11.
Mixtus cum Resina Terebinthina, & Avellanae nucis magnitudine devoratus.

Ovilem laetis sextario si quis adjiciat = A Pint and five Spoonfuls.
Cnici purgati denarios quattuor = dr. 4, gr. 10.
Et discotum ita ebat, molliet ventrem.
Quidam tribus Heminis vini = 1 ; Pint.
Adjiciunt Aloes denarii semissem, = scr. 1, gr. 11.
Et ita totum per partes aqua mixtum bibunt, ut molliant ventrem.

Solvit autem utiliter alvum ipsa Aloe per se victoriati denarii ponder = scr. 1, gr. 11.
Ex aqua cyathisis tribus vel frigidae = leven Spoonfuls.
Vel calida epota.

Purgat

* Cap. 2. Fecit enim magnos questus ex ea propter crebros succelsus in vitibus difficillimis; sed ne hic quidem unquam ulli vivus vivo compositionem isam offendit. Post mortem Tiberio Caesar per libellum scriptum data est, & per eum in bibliothecis publicis posita, venit in manus nostras, quamante nullo modo extrahere potuimus, quamvis omnia fecerimus, ut sciremus quae effet.
Weights and Measures, &c.

Purgat bene hac compositio ventrem,
Aloes denarii semissis = scr. 1, gr. 11.
Colophoniei denarii semissis = scr. 1, gr. 11.
Unde teruntur hac, adjicitur melis quod satis sit ad colligenda ea.
Datur ex aqua callidae vel frigidae cyathis quatuor.

Colophoniei denarii quatuor = dr. 4, gr. 10.
Bdelliai denarii duo = dr. 2, gr. 5.
Hac trita laetca succo colliguntur, & fregiuntur pilule magnitudine fabe, dantur a tribus pilulis usque ad septem, prout cujusque vires patiuntur.

Colophoniei denarios tres = dr. 3, gr. 7½.
Aloes & Tragacanthi binos = dr. 2, gr. 5.
Hoc pridie aqua maceratur, postero die ceteris admiscetur: sunt inde globuli fabae magnitudine: Dantur a tribus usque us ad septem.

Anguineai Cucumeris denarios VI = dr. 6, gr. 15.
Semis ex aqua mulsa.

Veratri nigri Radicis semissis = scr. 1, gr. 11.
Et ejus tertia portio pota ex vino passo.

Purgatio ventris qua facit ad lumborum dolores, & ad omnium febrium molestias depellendas.

Scammoniae * VIII = oun. 1, gr. 19½.
Veratri nigri, Anesi, Aphromiti, Nardi, Syriace, Caffes, Cinnamomoi, singulorum, denarios binos = dr. 2, gr. 5.
Dantur hac trita & mixta cum aqua mulsa hemina.

Purgatio ventris altera sic.
Scammoniae * XII = oun. 1, dr. 4, scr. 1, gr. 9.
Veratri nigri * XVI = oun. 2, scr. 1, gr. 19.
Croci * V = dr. 5, gr. 12½.
Myrrha * VII = dr. 7, gr. 17½.

Cinnamomoi
Tables of Ancient Coins.

Cinnamomi * VII. = dr. 7, gr. 17; 4.
Panacis * VIII. = oun. 1, gr. 19; 4.
Piperis * V. = dr. 5, gr. 12; 4.
Aphronitri * VI. = dr. 6, gr. 15.
Trita hac & in pulverem reducata, meli consparguntur: datur ex
his * I. S. aqua cyathis tribus.

Aliud remedium ad ventris purgationem.

Uva passa exemptis granis contusa * IV. = dr. 4, gr. 10; 4.
Anefi * VIII. = oun. 1, gr. 19; 4.
Elaterii, id est, Cucumeris in partes divis, lati, & faccari, * VII.
dr. 7, gr. 17. 
Veratri nigri * XVI. = oun. 2, lcr. 1, gr. 19.
Cunila feminis purgati interiora * XII. = oun. 1, dr. 4, lcr. 1,
gr. 9.
Ha in pulverem reducata colliguntur, & ex aqua dantur quantum
fabe trita grana sunt, superque acetum cum melle mixtum bibitur.

Alia ventris purgatio ejusdem effectus.

Sesammonis * VIII.
Veratri nigre * VIII.
Cucurbitae sylvestris interiora * VIII. = oun. 1, gr. 19; 4.
Aphronitri * VIII.
Iridis * VIII.
Nardi Syriace * V. S. & victoriati partem tertiam = dr. 5, lcr. 1,
gr. 3.
Myrrhe idem pondus = dr. 5, lcr. 1, gr. 3.
Ex his factus melle colligitur. Dantur ex medicamento hoc globuli
quantum fabe magnitudo est, ad demarios quatuor vel quinque, quibus
devoratis acetum melle mixtum, superdandum est.

Ad
Ad omnem febririum molestiam, &c.

Cucurbita sylvaticae interiores partes aridas qua quasi pluma sunt
*VI. = dr. 6, gr. 15.
Croci ac Panacis denarios senos, = dr. 6, gr. 15.
Marrubii succi *VIII. = dr. 8, gr. 19 f.
Glycyrrhizae * IV. = dr. 4, gr. 9 f.
Piperis albi * VI. = dr. 6, gr. 14 f.
Piperis longi * VI. = dr. 6, gr. 14 f.
Stachados * senn = dr. 6, gr. 14 f.
Scheni floris * quattuor = dr. 4, gr. 9 f.
Malabathri * tres = dr. 3, gr. 7 f.
Passo colliquamur trita hæc omnia, dantur ex bis denariis singuli cum
aqua calida cyathis binis vel ternis.

Hierà ad resolutum stomachum & rejicientem quocumque sumpserit.

Aloes nigra * V. = dr. 5, gr. 12 f.
Mafirhes * IV. = dr. 4, gr. 10.
Cinami, Scheni floris, Malabathri, Nardi Syriace, Croci, Afari,
Xylobalsami, singulorum denarios senos. = dr. 6, gr. 15.
Hæc trita vel contusa melle consparguntur, & ita repomuntur, &
quum opus est, ad modum fææ cum Oxyymelle dantur.

Purgatio quâ Cosmus Medicus frequenter usus est.

Scammonia denarii victoriati ponderis partem unam = fcr. 1, gr. 11.
Veratri nigri * l. = dr. 1, gr. 2 f.
Panacis * senn = fcr. 1, gr. 11.
Ex melle consparguntur hæc trita, datur ex his quantum mun avel-
dana est, ex aqua mulsa cyathis quattuor. Globuli quoque supradicta
S & 2

magnitudine
Tables of Ancient Coins,
magnitudine sicci, de hoc medicamento duo tresve dantur jejuno vel post canam vorandi.

Confectio Salis Cathartici.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scammoniæ uncias tres</td>
<td>oun. 2, dr. 5, scr. 2, gr. 11 1/4</td>
</tr>
<tr>
<td>Zingiberis uncias tres</td>
<td>oun. 3, dr. 5, gr. 8 1/4</td>
</tr>
<tr>
<td>Petroselini uncias tres</td>
<td>oun. 1, dr. 6, gr. 14</td>
</tr>
</tbody>
</table>

Ita ut Scammoniam coquas, ut minus ledat. Coques enim sic: mittes in pastam, & deinde mittes in furnum, ut cum ea coquatur, & aliquantulum plus mittes, ut quem cocta fuerit, ad superscriptum veniat pondus, & quem refrierit, tolles, & sic omnia teres, & miscabis, & ad quod volueris, manducandum in convivio pro quibuscumque salibus uteris.

Confectio Salis Cathartici, quam Marcellus osten-
dit sic.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salis duri &amp; assati P. I. - II.</td>
<td>oun. 1, dr. 7, scr. 1, gr. 17</td>
</tr>
<tr>
<td>Salis Ammoniaci P. I. - IV.</td>
<td>oun. 3, dr. 6, gr. 11</td>
</tr>
<tr>
<td>Piperis albi - III.</td>
<td>oun. 2, dr. 5, scr. 2, gr. 11 1/4</td>
</tr>
<tr>
<td>Zingiberis - IV.</td>
<td>oun. 3, dr. 5, gr. 8 1/4</td>
</tr>
<tr>
<td>Imulae feminis - II.</td>
<td>oun. 1, dr. 6, scr. 1, gr. 14</td>
</tr>
<tr>
<td>Ameos - III.</td>
<td></td>
</tr>
<tr>
<td>Hyssopi Cretici - III.</td>
<td></td>
</tr>
<tr>
<td>Laseras Radicis - III.</td>
<td></td>
</tr>
<tr>
<td>Thymi - III.</td>
<td></td>
</tr>
<tr>
<td>Folii - III.</td>
<td></td>
</tr>
<tr>
<td>Apii feminis - III.</td>
<td></td>
</tr>
<tr>
<td>Anesi - III.</td>
<td></td>
</tr>
<tr>
<td>Petroselini Macedonici - III.</td>
<td></td>
</tr>
</tbody>
</table>

Origani
Weights and Measures, &c.

Origani = quatuor = oun. 3, dr. 5, gr. 8.
Nasturtii seminis = tres = oun. 2, dr. 5, fcr. 2, gr. 11.
Hec omnia tunsa, cribrata, atque in pulvem tenuissimum redacta, & in unum commixta repones in vase vitreo, & inde quotiens aliquid sumes seu bibes, quasi pro aliis salibus uteris.

A Specimen of an Emulsion in Ulcerations of the Bladder.

Alterci seminis, malvae seminis, Cucumeris edulis seminis purgati, singulorum denarios senos = dr. 6, gr. 25.
Amygdalorum dulci purgatorum, nucleorum Pineorum purgatorum, singulorum teratos = dr. 3, gr. 17.
Opii * I. = dr. 1, gr. 2.
Croci * V. = dr. 5, gr. 12.
Passo contusa hec omnia consparguntur, datur hoc medicamentum ad mensuram denarii unius = dr. 1, gr. 2.
Ex passi cyathis duobus, = four Spoonfuls.
Et aqua tepida totidem.

Against Nephritick Pains.

Opii Drachmae III. = dr. 3, gr. 7.
De nucleis Pineis excaldatis & purgatis Drach. III.
Croci Drach. III.
Amygdala dulci excaldata & purgata Drach. III.
Avenula purgata & excaldata Drach. III.
Cucumberis seminis purgati Drach. XII. = oun. 1, dr. 4, fcr. 1, gr. 9.

Hyoscyami albi seminis Cyathos III.
Apii seminis Cyathos III.
Feniculi seminis Cyathos III.
Lapatii seminis Drach. I. = dr. 1, gr. 2.

Hec
Tables of Ancient Coins,

Hæc omnia primum separatim teres, & permiscebis cum passo Cretico.
Tum ex eo facies Trochisicos habentes Drachmas singulos, & dabis bibendos
singulos cum aqua mulfe calide Cyathis binis. = four Spoonfuls.

Against the Colick.

Panacis * IV. = dr. 4. gr. 9.
Piperis * IV. = dr. 4. gr. 9.
Dauci Cretici radicis vel semenis * VI. = dr. 6. gr. 13.
Sulphuris vivi * S. = fr. 1, gr. 11.
Opii duas tertiasve partes victoriati ponderis, = gr. 1 5 2 vel. 11.
Cassieei * S. = fr. 1, gr. 11.
Myrrha * III. = dr. 3, gr. 7.
Hæc trita & cribrata vino confagmentur, & ex iis sunt passilli
magnitudinis lupini. Dantur quum res postulat ex aceto & melie in
succum mixto Cyathis tribus. = seven Spoonfuls.

The Simple Doses of purging Medicines according to
Rufus Ephesiuss.

Felicule radicis ex mulso aut aqua ad Drachmas
duas,
Ireos radicis in mulso ad Drachmas septem
Pulpe Colocynthidos in mulso Drachma una
Siquis tamen mitius purgere volet, semen ejiciendum est.
Calcifraga in mulso ad Drachmas duas
Peplos & Peplis absque dolis
Aloes in mulso Drachmas duas

Ou. Dr. Scr. Gr.
0 2 0 5
0 7 0 17
0 1 0 25
0 2 0 5
0 2 0 5
Hippophaes
Weights and Measures, &c.

Hippophaes succi per se obolos tres
Hippophaestum minori copia
Pycnoconum ejus radicem comedendum dato
Vitis Drachmas duas
Epithymum tritrum & cretum dandum est in vino
dulci semiuncia cum Siciliquo mensura
Thymi comae Acetabuli mensura, a little above
the eighth part of a Pint
Amaraci succi melle excepti, Drachmæ quatuor
Similiter & Oreganum danda sint succa cum mulso
Acetabuli mensura, the eighth part of a Pint.
Papaveris ustruisque feminis in mulso Acetabulum,
the eighth of a Pint
Cucumeris Radicis succus ad pondus trium obolorum
Heliotropii minoris manialis fasciculus in decocto
Sesamoidis feminis Acetabuli dimidium: the sixteenth part of a Pint
Tithymalli succi Drachma
Esali folia perarida mulso soluta mensura Acetabuli
the eighth of a Pint
Camerii folia nonnulli Absinthium admiscentes in
Cataporia degerunt Pondus idoneum drachmæ
due
Lathirius comestra Graea decem
Agaricum ex mulso aut pesca ad Siciliquum
Euphorbiurn, delunt cetera.

Ou. Dr. Scr. Gr.
0 0 1 1 1
0 2 0 5
0 4 0 1 0
0 2 0 5
0 4 0 1 0
0 0 1 1 1
0 0 1 1 1
0 1 0 2
0 2 0 5
0 1 0 1 4
0 2 0 5

The
The Doses of simple purging Medicines, according to Paulus Aegineta.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Ounces</th>
<th>Drachms</th>
<th>Scruples</th>
<th>Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aloes Drachma una cum aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Drachma una Radicum [veratri nigri] in aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Scammonica —— pondere Obolorum quattuor</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Colocynthidis Medulla Drachmæ pondere</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Elaterium —— trium Obolorum pondere cum laque</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Thymylli guttae quatuor aut quinque cum polenta</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Latyrides —— septem aut octo et ad quindecim, ita ut robusti et ampliori</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
</tr>
<tr>
<td>purgatione opus habentes, ipsas mandere jubeantur</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
</tr>
<tr>
<td>Peplii virgulta, octo obolorum pondere in aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
</tr>
<tr>
<td>Agaricum datur trium duarum Drachmarum pondere cum aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
</tr>
<tr>
<td>Iris Illyrica octo Obolorum pondere in aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>1 1/2</td>
<td>2</td>
</tr>
<tr>
<td>Centaurii sesquidrachma in aquæ hemina</td>
<td>0</td>
<td>1 1/2</td>
<td>1 3/4</td>
<td>2</td>
</tr>
<tr>
<td>Tragorigani flos cum femine duarum drachmarum pondere in aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Chamehæa drachma quatuor in aqua mulsa</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Aristolochiæ Clematidis feminis drachma una in aqua mulsa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Polipodii Radix ficca trita aquæ mulæ inspersa, (without the Dose.)</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Epithymi drachmæ quinque triti cum fero laevis</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Pulegium Acetabuli mensura in aquæ mulsa (the eighth of a Pint.)</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Tragorigani heracleotici eadem mensura.</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

Alispi
Weights and Measures, &c.

Alispi feminis eadem mensura cum sale & aceto.
Styraxis albi drachma una cum Resina Terebinthina equalis ponderis.
Oleo radicis cortex drachma pondere cum vino aut aqua.
Pyrethri oboli novem cum aqua.
Lychnidis feminis drachma dua.
Cyclaminis radicis Drachma una cum aqua mulsa.
Scordii drachma dua cum melle.
Squamae Cypriae Drachma dimidia cum pari resina in Catapotis.
Foliorum Lauri viridium sesquidrachma.
Cucumeris silvestris Radicis Corticis oboli duo.
Ricini Grana quadraginta, qui Crotones appellantur.

Bdellii Drachma dua cum aqua mulsa.
Squamae Cypriae drachma una cum aqua mulsa.
Verum aceti parum insuper absorbere oportet u ne remoratur Grani Cnidii, a Granis viginti ad quadraginta.
Euphorbii Drachma una cum melle cocho.
Lonicerdis feminis oboli octo cum aqua mulsa.
Onici feminis Drachmæ quinque.
Ammoniaci Thymiamatis Drachmæ dua in aqua mulsa.
The Doses of compound purging Medicines, from Paulus Æginæta.

Cataporia ex Aloe; Colocynthidis medulla partem unam, fumi Ab-
synthii partem unam, Aloes partem unam, Scammoniae partes
duas, cum aqua in Cataporia efformata Ciceris magnitudine: datur
ex his Graia undecim.

Purgatorium aquam ducens ex Caryophyllo.

Aloes, Episthymi, Caryophyllic, Grani Oridii, Pe-
troelini, Rhei Pontici, singulorum semuncia,
Euphorbii scrupulos quattuor;
Mellis quod satis est datur Coehlarei mensura.

Purgatorium ex Mali Citri, Romanche granum.

Mali Citrii Corticis & Carnis libra una
In aquæ Sextario uno [one Pint] semis ad ter-
rías coquito. Et mellis sextario dimidio adjícit, ad
mellis spissitudinem coquito.
Et piperis longi uncia
Scammoniae in fermento tostæ uncia, terito ac in-
spergito.

Buccellatus purgatorius.

Scammoniae tostæ uncia I.
Piperis & seminis Apii singulorum scrup. I.
Fæniculi, Aniis, singulorum uncia I.
Mellis libra I.
De moderato tostis dato unc. I. in condition.
Vinum purgatorium in Hydropicis.

Scylla quadrantem
Apii seminis sexuncem
Piperis Drachma I.
Capparis Radicis Drachma IV.
Grani Cnidii decorticati Drachma I.
Folii Malabathri globulos II.
Vini hennas XII.
Mellis Sextar. III.
Scyllam contusam in vino macerato, reliqua trita admisceto.

Purgatoria ex Hermodactylo Podagrica.

Hermodactylis quadrantem
Anifi, Cuminii Æthiopici, Ameos, Thymi Corymborum, Piperis albi,
Zingiberis, singulorum scrup. III.
Ephibymi semunciam
Dofis scrup. IV. — aliqui sex dant.
Dantur mane cum condito, aut aqua mulsa, aut mero fervesante.
Some Instances of the Practice of Aretæus.

As to Blood-letting he was very judicious, both as to the cases and quantities.

* In Frenzies he was against letting much Blood at a time, because such Patients were apt to fall into a fainting Fit; unless it was the case of a young, strong, and replete Body: and even in such a case less was to be let, because they were frantick. But if the original of the Disease was in the Heart and not the Brain, then Blood was to be let the more liberally, and at one time.

* In Apoplexies he lays great Stres upon letting Blood, but owns that it is hard to proportion the due Quantity. * In the Cure of a Tetanus he is for letting Blood once, not quite to the fainting of the Patient. The vein in the Arm is that which he commonly opens, in curvatura Cubiti: and he gives a particular caution in this case to make a slack compression, for fear of exciting a Convulsion. * In a Quinsy he orders Blood-letting in some cases till the Patient faints, at least till he is very near it. * It appears that he thought copious Blood-letting was more necessary in a Quinsy, than in an Inflammation of the Lungs, for in that case he orders it not quite ad anima deliquium. * In the Head-ach he orders the opening of the vein of the Forehead, and Blood to be let to the quantity of a Hemina, or a little more, that is somewhat more than

---


2. ibid. cap. 1. autem cito Hemina aut paulo plus.

3. Aequalis lute adjutorium utpote magnum affectui magnum remedium missio sanguinis est.


5. De Morb. diurnor. curatio-ne. Pollica ite- rum venæ froutis recta scidunt et, hac enim est opportune sanguinis detractio, modus evanetur, semel auferendum est.
Tables of Ancient Coins,

than half a Pint; this is the first time that I have read of any Measure of the quantity of Blood. * His Purges are Cnicus and black Hel-lebor, and Hiera to the quantity of two Drachms to be given sometimes at Night. * Elaterium, mention'd only with this restriction, as much as is necessary to purge a man, and Cneorum or Thymelae without mentioning any Dose. These last in a Quinsy, in which Disease he commends the Elaterium as most proper. He commends the Radix Rhei or Rhubarb as a better astringent than the juice of Hypocistis or Accatia, he orders it in the weight of three Oboli, or thirty one Grains. He commends Hellebor in Melancholy, and tells you that he will describe the several Species of it, and manner of using of it, which is lost, with many other passages of his Works: you may see his commendation of white Hellebor in the quotation at the bottom of the page, which I think is very remarkable.

For Vomits he uses Caesamomii pars, Æris combusii Æ, ex mulso in Epilepsies, this he faith will either vomit or purge. Afterwards he adds these words, verum potentiora etiam his medicamna ad vomitum deligenda sunt, ut Narcissi, Bulbi, Sinapis, & Hyssopi pares partes, Æris & Piperis dimidio minus quam priora, cum melle miscens ex-hibite.

For Clysters he uses Nitre, Euphorbium the weight of three Oboli or thirty one Grains, the inward part of a sort of Gourd, of the decoction of Centaury in Oyl or Water, Honey with Rue, Turpentine and Hyssop; Exempli gratia, Lotion per Clysterum usitata opus est:

---

* De curat. acutor. morb. cap. 2.  * Ibid. cap. 7.
At si deglutendi via expeditissima sit, Elaterium & cum mulsa & cum fero laeis, quantum ad purgandum hominem fatis sit, praebatur. Allis enim purgatorius Elaterium in his aegrotis praefatius est. Conferunt etiam Cneorum fen Thymelæ & Sinapi.——Quin & album Vernum non vomitum tautum molitur, sed & etiam omnium firmul purgantium medicamentorum efficacissimum est, non multitudine & varietate excrementorum: id enim & affedus ille qui cholera dicitur, praestare solet) non distentionibus & violentia in vomendo (ad hoc enim & nauseas & mare validiora sunt) sed potentia & qualitate non vitiosa; quippe quae laborantium sanitatem reddit per exiguum purgationem, & modicam intentionem. vetuitorum praeterea morborum omnium firmus Radicibus inhaerentium, si cuneta alia medicamina viribus inferiorem sint, id unicum remedium est; siquidem igni facultate persimile est album Veratrnum: & quod ignis exures facit, eo plus veratrnum interiorius discurrrens operatur; videlicet facilem inspiracionem ex difficili, ex pallido colore floridum, & ex macie corputentiam.
Tables of Ancient Coins,

He fomented the Head with Opiums to procure Sleep, particularly he commends the Poppy boil'd in Oyl and applied to the back part of the Head; and a Solution of Opiums in Water to foment the Forehead. Cap. I. de morbis acutis. Magis autem superflue est Papaver in oleo elixire, capitum fruepti superdatum.

At si valentioribus auxilium egubum, ipsa etiam Papaveris lachryma ex aqua frons insinuenda. There are other mechanical helps he uses to procure Sleep, in the same Chapter, not amiss, particularly the scratching of the Temples and the Ears, for he saith even that mollifies the fury of wild Beasts. These Remedies are prescribed in Madness.

For blistering, particularly in the falling Sickness, he uses Frictions with Castor-oil, but before orders Milk for fear they should inflame the Bladder. De curatione diurnae. morb. cap. 4.

For the same purpose he uses Lemmasides or Adarca.

Euphorbium cum anguine glaucoma, and the singing the Legs with Nettles, these in a Lethargy. De Curis. morb. acut. cap. 2.

He uses Frictions with Squills for the same purpose.

He orders Cafer in the Dose of half a Drachme, and the same in Clivers, Caftorem dimidio Drachmae pondere ex mulso Cyathis tribus ad pluris dies bibendum est; si bibi virum non sustinet, ad demolendam calamitatem, cum olei cyathis tribus, in quo ruta incutita sit, duplum in tram fatas initium infundatur, idque per pluris dies sustentandum. He prescribes it afterwards in the dose of three Oboli, which is the same quantity; and yet he prescribes Assa satida in the bigness of an Ervum or Verch. Quod si Cyreniaci Lasnecitii lachryma copia ibi fiat, hanc opus est malle soto involutam ad Ervi magnitudinem devrandam dare. By this passage it would seem that this Drug had not been so common. The Ervum I believe is a larger quantity than a Vetch, or even a common Pea.

He commends Milk as the Specific in Consumptions. (De curatione morb. acut. lib. 1.) but he reckons Women's Milk new the best, and Goat's the worst. Morb. acut. lib. 2. cap. 6.
Weights and Measures, &c.

He allows Patients that are subject to fainting not above half a Pint. Ibid. cap. 3.

Thus I have slightly touched this Subject so far as it falls in with my present Design, and I take the Liberty to recommend the further Prosecution of it to some Student of the Profession, as a Work both useful to himself and the Publick.

It had been sufficient in most Places of this short Essay, to have set down the proportion of the Ingredients, noting only for once the small difference of the Denarius and Drachm; but it having been done in the Manuscript in every particular, I thought it was needless to expunge it.

FINIS.

ERRATA.

Page 147 dele Varro, read Aelian who relates, &c.
190 for artificium, read artificum.
224 for Phoce, read Phocae.
251 for Venetze, read Veneti.
272 after Phoenicians, add who.
ibid. Note M. inferi before the Birth of Christ.
### English measures of length

<table>
<thead>
<tr>
<th>Inch</th>
<th>3 Palm</th>
<th>4 Span</th>
<th>6 Foot</th>
<th>8 Cubit</th>
<th>10 Yard</th>
<th>12 Pace</th>
<th>14 Faddom</th>
<th>17 Pole</th>
<th>20 Furlong</th>
<th>30 Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>4 1/2</td>
<td>5</td>
<td>6 1/2</td>
<td>7</td>
<td>8 1/2</td>
<td>9 1/2</td>
<td>10</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>35</td>
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<tr>
<td>12</td>
<td>24</td>
<td>24</td>
<td>32</td>
<td>40</td>
<td>44</td>
<td>52</td>
<td>62</td>
<td>70</td>
<td>80</td>
<td>96</td>
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<tr>
<td>18</td>
<td>36</td>
<td>36</td>
<td>48</td>
<td>60</td>
<td>68</td>
<td>84</td>
<td>98</td>
<td>108</td>
<td>120</td>
<td>144</td>
</tr>
<tr>
<td>216</td>
<td>432</td>
<td>432</td>
<td>576</td>
<td>720</td>
<td>840</td>
<td>1008</td>
<td>1152</td>
<td>1260</td>
<td>1512</td>
<td>1824</td>
</tr>
</tbody>
</table>

### Greecian measures of length reduced to English

| Greecian | 400 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
### Roman Measures of Length

<table>
<thead>
<tr>
<th>Digitus transversus</th>
<th>English</th>
<th>Feet</th>
<th>Inch. Dec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/3 uncia</td>
<td>0</td>
<td>0</td>
<td>0,725 1/4</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2,901</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>0</td>
<td>11,604</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>1</td>
<td>9,050</td>
</tr>
<tr>
<td>24</td>
<td>1 1/2</td>
<td>1 1/2</td>
<td>5,406</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
<td>2</td>
<td>5,210</td>
</tr>
<tr>
<td>80</td>
<td>4</td>
<td>4</td>
<td>10,050</td>
</tr>
<tr>
<td>10,000</td>
<td>12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>80,000</td>
<td>120</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>800,000</td>
<td>867</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Scripture Measures of Length

<table>
<thead>
<tr>
<th>Digit</th>
<th>English</th>
<th>Feet</th>
<th>Inch. Dec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>palm</td>
<td>0</td>
<td>0,912</td>
</tr>
<tr>
<td>12</td>
<td>span</td>
<td>0</td>
<td>3,648</td>
</tr>
<tr>
<td>24</td>
<td>cubit</td>
<td>1</td>
<td>9,888</td>
</tr>
<tr>
<td>96</td>
<td>fathom</td>
<td>7</td>
<td>3,532</td>
</tr>
<tr>
<td>144</td>
<td>Ezekiel's Reed</td>
<td>10</td>
<td>11,328</td>
</tr>
<tr>
<td>192</td>
<td>Arabian pole</td>
<td>14</td>
<td>7,104</td>
</tr>
<tr>
<td>1920</td>
<td>Schemus measuring line</td>
<td>14 1/2</td>
<td>7,104</td>
</tr>
</tbody>
</table>

### The Longer Scripture Measures

Note the East of another Span equal to 1/3 of a Cubit.

<table>
<thead>
<tr>
<th>Cubit</th>
<th>English</th>
<th>Miles</th>
<th>Paces</th>
<th>Feet. Dec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>stadium</td>
<td>0</td>
<td>145</td>
<td>1,824</td>
</tr>
<tr>
<td>2000</td>
<td>Sab days journey</td>
<td>0</td>
<td>729</td>
<td>4,6, 3,0</td>
</tr>
<tr>
<td>4000</td>
<td>Eastern mile</td>
<td>1</td>
<td>403</td>
<td>1,0</td>
</tr>
<tr>
<td>12000</td>
<td>parasang</td>
<td>4</td>
<td>153</td>
<td>3,0</td>
</tr>
<tr>
<td>96000</td>
<td>a days journey</td>
<td>33</td>
<td>172</td>
<td>4,0</td>
</tr>
</tbody>
</table>

Digitized by Google
**English square measures.**

<table>
<thead>
<tr>
<th>Inches</th>
<th>Feet</th>
<th>Yards</th>
<th>Paces</th>
<th>Poles</th>
<th>Rood</th>
<th>Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 4.4</td>
<td>1296</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3600</td>
<td>25</td>
<td>2 3/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39204</td>
<td>27 2/3</td>
<td>30 1/2</td>
<td>10, 89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1568160</td>
<td>1090</td>
<td>12 10/12</td>
<td>435.6</td>
<td>40</td>
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<tr>
<td>6272640</td>
<td>43560</td>
<td>4840</td>
<td>1743.6</td>
<td>160</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**English measures of capacity.**

<table>
<thead>
<tr>
<th>Solid Inches</th>
<th>Pint</th>
<th>Gallon</th>
<th>Rundlet</th>
<th>Barrel</th>
<th>Tierce</th>
<th>Hogshead</th>
<th>Pincion</th>
<th>Butt</th>
<th>Tun</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 2/3</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>415.8</td>
<td>14.4</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>727 6/1</td>
<td>25 2</td>
<td>31 1/2</td>
<td>1 3/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9702</td>
<td>336</td>
<td>42</td>
<td>23 1/2</td>
<td>1 1/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14553</td>
<td>504</td>
<td>63</td>
<td>3 3/2</td>
<td>2</td>
<td>1 1/2</td>
<td>Hogshead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19279</td>
<td>672</td>
<td>8 4/3</td>
<td>2 2/3</td>
<td>2</td>
<td>1 1/3</td>
<td>Pincion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29106</td>
<td>1008</td>
<td>12 6/7</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1 1/2</td>
<td>Butt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58212</td>
<td>2016</td>
<td>25 2/4</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**English Corn measures.**

are raised from a Winchester Gallon, which contains 27 2 1/4 solid Inches & as far as serves our purpose are.

<table>
<thead>
<tr>
<th>Solid Inches</th>
<th>Pints</th>
<th>Gallon</th>
<th>Peck</th>
<th>Bushel</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>34 3/16</td>
<td>8</td>
<td></td>
<td>16</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>27 2/3</td>
<td>8</td>
<td></td>
<td>64</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>54 4/5</td>
<td>16</td>
<td></td>
<td>64</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>21 7/8</td>
<td>64</td>
<td>8</td>
<td>64</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>17424</td>
<td>512</td>
<td>64</td>
<td>64</td>
<td>8</td>
<td>32</td>
</tr>
</tbody>
</table>
Grecian Square Measure.

Πλέθρων by some said to contain 1444, others 10000 sq. Feet.

Aργύρων the half of the Πλέθρων.

The Egyptian Αργύρων was \( \sqrt{ } \) square of 100 Cub."

Roman Square Measure.

The Romans divided their As, Libra or any Integer after the following manner, so the Jugerum was reckoned \( \sqrt{ } \) Integer.

<table>
<thead>
<tr>
<th>Unciae</th>
<th>Unciae</th>
<th>Square Feet</th>
<th>Scruples</th>
<th>Eng. Roods</th>
<th>Sq. Poles</th>
<th>Sq. Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>As</td>
<td>28800</td>
<td>288</td>
<td>2</td>
<td>18</td>
<td>2500</td>
</tr>
<tr>
<td>( \frac{1}{12} )</td>
<td>Deux</td>
<td>26400</td>
<td>264</td>
<td>2</td>
<td>10</td>
<td>183 87</td>
</tr>
<tr>
<td>( \frac{1}{10} )</td>
<td>Dextans</td>
<td>24000</td>
<td>240</td>
<td>2</td>
<td>2</td>
<td>177 64</td>
</tr>
<tr>
<td>( \frac{1}{9} )</td>
<td>Dodrans</td>
<td>21600</td>
<td>216</td>
<td>1</td>
<td>34</td>
<td>51 42</td>
</tr>
<tr>
<td>( \frac{1}{8} )</td>
<td>Bes</td>
<td>19200</td>
<td>192</td>
<td>1</td>
<td>25</td>
<td>257 46</td>
</tr>
<tr>
<td>( \frac{1}{7} )</td>
<td>Septumx</td>
<td>16800</td>
<td>168</td>
<td>1</td>
<td>17</td>
<td>191 25</td>
</tr>
<tr>
<td>( \frac{1}{6} )</td>
<td>Semis</td>
<td>14400</td>
<td>144</td>
<td>1</td>
<td>9</td>
<td>125 03</td>
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<tr>
<td>( \frac{1}{5} )</td>
<td>Quincunx</td>
<td>12000</td>
<td>120</td>
<td>1</td>
<td>1</td>
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<td>9600</td>
<td>96</td>
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<td>264 45</td>
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<td>( \frac{1}{3} )</td>
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<td>7200</td>
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<tr>
<td>( \frac{1}{2} )</td>
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<td>4800</td>
<td>48</td>
<td>0</td>
<td>16</td>
<td>132 43</td>
</tr>
<tr>
<td>( \frac{1}{12} )</td>
<td>Uncia</td>
<td>2400</td>
<td>24</td>
<td>0</td>
<td>8</td>
<td>66 21</td>
</tr>
</tbody>
</table>

NOTE. Achus Major was 14400 Square feet equal to a Semis-
Clina 3600 Square feet equal to a Sextuncia.
Achus minimus equal to a Sextans.
### ATTICK measures of capacity for things Liquid.

#### ENGLISH WINE MEASURE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.356 3/10</td>
</tr>
<tr>
<td>1</td>
<td>1/120</td>
<td>1/60</td>
<td>0.071 9/10</td>
</tr>
<tr>
<td>2</td>
<td>1/48</td>
<td>1/24</td>
<td>0.178 1/4</td>
</tr>
<tr>
<td>3</td>
<td>1/30</td>
<td>1/18</td>
<td>0.356 2/10</td>
</tr>
<tr>
<td>4</td>
<td>1/24</td>
<td>1/12</td>
<td>0.535 5/8</td>
</tr>
<tr>
<td>5</td>
<td>1/18</td>
<td>1/9</td>
<td>2.141 1/8</td>
</tr>
<tr>
<td>6</td>
<td>1/12</td>
<td>1/6</td>
<td>4.283</td>
</tr>
<tr>
<td>7</td>
<td>1/6</td>
<td>1/3</td>
<td>6.698</td>
</tr>
<tr>
<td>8</td>
<td>1/3</td>
<td>2</td>
<td>9.626</td>
</tr>
</tbody>
</table>

### ATTICK measures of capacity for things Dry.

#### ENGLISH CORN MEASURE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.276 6/10</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2.763 1/2</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>16.579</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>33.158</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>50.795</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>68.431</td>
</tr>
</tbody>
</table>

N.B. Besides this Medinum which is the Medicus, there was a Medinum Georgicus equal to 6 Roman Modij
N.B. There are some other measures (mentioned by Authors) of uncertain value easily reducible to those of Tables.
## Roman Measures of Capacity for Things Liquid

<table>
<thead>
<tr>
<th>Ligula</th>
<th>English Wine Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Cyathus</td>
<td>0 - 0 3/8 - 0.177</td>
</tr>
<tr>
<td>6 1 1/2 Acetabulum</td>
<td>0 - 0 3/8 - 0.469 3/4</td>
</tr>
<tr>
<td>12 3 2 Quartarius</td>
<td>0 - 0 1/2 - 1.409</td>
</tr>
<tr>
<td>24 6 4 2 Hemina</td>
<td>0 - 0 1/8 - 2.818</td>
</tr>
<tr>
<td>48 12 8 4 2 Sextarius</td>
<td>0 - 1 - 5.636</td>
</tr>
<tr>
<td>288 72 48 24 12 6 Congius</td>
<td>0 - 7 - 4.942</td>
</tr>
<tr>
<td>1152 288 192 96 48 24 4 Urna</td>
<td>3 - 4 1/8 - 5.33</td>
</tr>
<tr>
<td>2304 576 384 192 96 48 8 2 Amphora</td>
<td>7 - 1 - 10.66</td>
</tr>
<tr>
<td>46080 11520 7680 3840 1920 960 480 40 20 Culeus</td>
<td>143 - 3 - 11.095</td>
</tr>
</tbody>
</table>

Note 1: Quadrantal is same as 6 Amphora. Cadus, Cingarius, & Doliun denote no certain measure.

Note 2: The Romans divided the Sextarius or the Libra into 12 equal parts called Cyath and there

## Roman Measures of Capacity for Things Dry

<table>
<thead>
<tr>
<th>Ligula</th>
<th>English Corn Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Cyathus</td>
<td>0 - 0 - 0 3/8 - 0.4</td>
</tr>
<tr>
<td>6 1 1/2 Acetabulum</td>
<td>0 - 0 - 0 1/8 - 0.6</td>
</tr>
<tr>
<td>24 6 4 Hemina</td>
<td>0 - 0 - 0 4/8 - 0.24</td>
</tr>
<tr>
<td>48 12 8 2 Sextarius</td>
<td>0 - 0 - 1 - 0.48</td>
</tr>
<tr>
<td>384 96 64 16 8 Seminmod</td>
<td>0 - 1 - 0 - 3.84</td>
</tr>
<tr>
<td>768 192 128 32 16 2 Modius</td>
<td>1 - 0 - 0 - 7.68</td>
</tr>
</tbody>
</table>

## Jewish Measures of Capacity for Things Liquid

<table>
<thead>
<tr>
<th>Caph</th>
<th>Gall. Pints. Sol Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/3 Log</td>
<td>0 - 0 3/8 - 0.177</td>
</tr>
<tr>
<td>5 1/3 4 Cab</td>
<td>0 - 0 3/8 - 0.844</td>
</tr>
<tr>
<td>16 12 3 Hin</td>
<td>1 - 2 - 2.533</td>
</tr>
<tr>
<td>32 24 6 2 Seah</td>
<td>2 - 4 - 5.067</td>
</tr>
<tr>
<td>96 72 18 6 3 Bath Epha</td>
<td>7 - 4 - 15.2</td>
</tr>
<tr>
<td>960 720 180 60 30 10 Coron Chomer</td>
<td>75 - 5 - 7.625</td>
</tr>
</tbody>
</table>
JEWISH measures of Capacity for things dry: English Corn Measure.

| Gachal | Cab | Gomor | 15
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>6</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>360</td>
<td>18</td>
<td>10 3</td>
<td>3</td>
</tr>
<tr>
<td>1800</td>
<td>90</td>
<td>50 15</td>
<td>5</td>
</tr>
<tr>
<td>3600</td>
<td>180</td>
<td>100 30</td>
<td>10 2</td>
</tr>
</tbody>
</table>

Chomer Coron

1 - 0 - 1 - 18,969

ENGLISH (Troy) weight.

Grains. 8° Ounces. Pen. W. ‡ Grains

| 24 | Penny-weight. |
| 480 | 100 | Mav. |
| 5760 | 6000 | Talareum. |


| 4  | Silique. |
| 12  | Obolus. |
| 24  | Scriptulum. |
| 72  | Drachma. |
| 96  | Sextula. |
| 144 | Sicilicus. |
| 192 | Duella. |
| 576 | Uncia. |
| 6012 | Libra. |

The Roman Ounce is the English Avoirdupois Ounce, which they divided into 7 Denarij, as well as 8 Drachmas, and since they reckoned their Denarius equal to the Attick Drachm this will make the Attick weights ½ heavier than the correspondent Roman weights.

Note: The Greeks divided their Obolus into Chaei and Sextas; some as Diodorus and Strabon divided the Obolus into 6 Chaei, and every Chalcus into 5 Sextas; others divided the Obolus into 8 Chaei, and every Chalcus into 8 Sextas or minuta.
The greater weights reduced to Engl. Troy weight.

<table>
<thead>
<tr>
<th>Libra</th>
<th>Ounces</th>
<th>Den. Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>13 1/2</td>
</tr>
<tr>
<td>1/2</td>
<td>11</td>
<td>16 2/3</td>
</tr>
<tr>
<td>1/3</td>
<td>12</td>
<td>19 5/6</td>
</tr>
<tr>
<td>1/4</td>
<td>14</td>
<td>22 4/6</td>
</tr>
<tr>
<td>1/8</td>
<td>16</td>
<td>25 3/4</td>
</tr>
<tr>
<td>1/16</td>
<td>18</td>
<td>28 1/2</td>
</tr>
</tbody>
</table>

Note: There was another Attic Talent by some said to consist of 80 by others a 100 Mina.

Note: every Mina contains a 100 Drachmae and every Talent 60 Mina, but the Talents differ in weight according to the different Standard of the Drachmae and Mina of which they are composed. The value of some different Minae and Talents in Attick Drachmae, Minae and English Troy weight, is exhibited in the following Table.

### MINA.

<table>
<thead>
<tr>
<th>Mina</th>
<th>1/16 Ounces</th>
<th>Pennies</th>
<th>Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aegyptiaca</td>
<td>133 1/3</td>
<td>1</td>
<td>19 1/2</td>
</tr>
<tr>
<td>Antiochica</td>
<td>133 1/3</td>
<td>1</td>
<td>19 1/2</td>
</tr>
<tr>
<td>Cleopatrae Ptolemaica</td>
<td>144</td>
<td>1</td>
<td>19 1/2</td>
</tr>
<tr>
<td>Alexandrina Dioscoridis</td>
<td>160</td>
<td>1</td>
<td>19 1/2</td>
</tr>
</tbody>
</table>

### TALENTUM.

<table>
<thead>
<tr>
<th>Talentum</th>
<th>1/16 Ounces</th>
<th>Pennies</th>
<th>Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aegyptiacum</td>
<td>80</td>
<td>1</td>
<td>13 1/2</td>
</tr>
<tr>
<td>Antiochicum</td>
<td>80</td>
<td>1</td>
<td>13 1/2</td>
</tr>
<tr>
<td>Ptolemaicum Cleop.</td>
<td>86 2/3</td>
<td>1</td>
<td>13 1/2</td>
</tr>
<tr>
<td>Alexandrae</td>
<td>96</td>
<td>1</td>
<td>13 1/2</td>
</tr>
<tr>
<td>Insulanum</td>
<td>120</td>
<td>1</td>
<td>13 1/2</td>
</tr>
<tr>
<td>Antiochia</td>
<td>360</td>
<td>1</td>
<td>13 1/2</td>
</tr>
</tbody>
</table>
JEWISH WEIGHTS reduced to English Troy Weights.

<table>
<thead>
<tr>
<th>Shekel</th>
<th>60</th>
<th>Maneh</th>
<th>02</th>
<th>03</th>
<th>06</th>
<th>10 3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>50</td>
<td>Talent</td>
<td>113</td>
<td>10</td>
<td>01</td>
<td>10 3/4</td>
</tr>
</tbody>
</table>

Note in reckoning money 50 Shekels made a Maneh, but in weight 160 Shekels.

The value and proportion of the Grecian Coins

<table>
<thead>
<tr>
<th>ηπτων</th>
<th>Χαλκος</th>
<th>Ελασσον</th>
<th>Ελασσον</th>
<th>ηπτων</th>
<th>ηπτων</th>
<th>ηπτων</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>28</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>32</td>
<td>64</td>
<td>128</td>
</tr>
<tr>
<td>56</td>
<td>8</td>
<td>16</td>
<td>32</td>
<td>64</td>
<td>128</td>
<td>256</td>
</tr>
<tr>
<td>112</td>
<td>16</td>
<td>32</td>
<td>64</td>
<td>128</td>
<td>256</td>
<td>512</td>
</tr>
<tr>
<td>224</td>
<td>32</td>
<td>64</td>
<td>128</td>
<td>256</td>
<td>512</td>
<td>1024</td>
</tr>
<tr>
<td>336</td>
<td>48</td>
<td>96</td>
<td>192</td>
<td>384</td>
<td>768</td>
<td>1536</td>
</tr>
<tr>
<td>662</td>
<td>96</td>
<td>192</td>
<td>384</td>
<td>768</td>
<td>1536</td>
<td>3072</td>
</tr>
<tr>
<td>1324</td>
<td>192</td>
<td>384</td>
<td>768</td>
<td>1536</td>
<td>3072</td>
<td>6144</td>
</tr>
<tr>
<td>1660</td>
<td>256</td>
<td>512</td>
<td>1024</td>
<td>2048</td>
<td>4096</td>
<td>8192</td>
</tr>
</tbody>
</table>

Note of these the Drachma, Didrachm &c. were of Silver, the rest for the most part of Brass, the other parts as Tridrachm, Triobolus &c were sometime Coin'd.

N 2 I have suppos'd with the generality of Authors that the Drachma and Denarius were equal, tho' ther's reason to believe the Drachma was somewhat the weightier.

The Grecian Gold Coin was if Stater Aureus weighing 2 Attick Drachms or half of if Stater Argenteus &c exchanging usually for 25 Attick Drachms of Silver in our money 16 - 16 1/4

According to our proportion of Gold to Silver 1 - 00 - 9

There were likewise if Stater Cyzicenus exchanging for 28 Attick Drachms or 00 - 18 - 1

Stater Phillipicus & Stater Alexandrinus of the same value

Stater Darius according to Josephus worth 50 Attick Drachms or 01 - 12 - 3 1/2

Stater Cælius of the same value
The **Greek** manner of reckoning sums of money, was by **Drachmas.**

<table>
<thead>
<tr>
<th>Value</th>
<th>Syms</th>
<th>Drachmas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.00-0.07</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.06-0.53</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>3.04-0.07</td>
<td></td>
</tr>
</tbody>
</table>

**Minae.**

<table>
<thead>
<tr>
<th>Value</th>
<th>Minae</th>
<th>Talentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.04-0.07</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>32.05-1.00</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>193.15-0.00</td>
<td></td>
</tr>
</tbody>
</table>

**Talentum.**

<table>
<thead>
<tr>
<th>Value</th>
<th>Talentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>193.15-0.00</td>
</tr>
<tr>
<td>10</td>
<td>1937-10.00</td>
</tr>
<tr>
<td>100</td>
<td>19375-00.00</td>
</tr>
</tbody>
</table>

2.4. I have given the value of **y** different Talents and Mina, considered as Weights; but when they denote Sums of Money, they vary after the following manner.

**Minae.**

<table>
<thead>
<tr>
<th>Value</th>
<th>Minae</th>
<th>Talentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.04-0.07</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>32.05-1.00</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>193.15-0.00</td>
<td></td>
</tr>
</tbody>
</table>

**Talentum.**

<table>
<thead>
<tr>
<th>Value</th>
<th>Talentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>193.15-0.00</td>
</tr>
<tr>
<td>10</td>
<td>1937-10.00</td>
</tr>
<tr>
<td>100</td>
<td>19375-00.00</td>
</tr>
</tbody>
</table>

The **value and proportion** of the Roman coins:

<table>
<thead>
<tr>
<th>Value</th>
<th>Roman Coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sembella</td>
</tr>
<tr>
<td>4</td>
<td>As</td>
</tr>
<tr>
<td>10</td>
<td>Sesterius</td>
</tr>
<tr>
<td>20</td>
<td>Quinarius</td>
</tr>
<tr>
<td>40</td>
<td>Denarius</td>
</tr>
</tbody>
</table>

**Note of these the Denarius, Victoriatus, Sesterius and sometimes the As were of Silver, the rest of Brass.**

**There were sometimes also coined of Brass the Triens, Sextans, Uncia, Sextula and Dupondius.**
The Roman gold coin was the Aureus, which weighed generally double the Denarius; the value of which according to the first proportion of coinage mentioned by Pliny Lib. XXXIII. Cap. III. was worth 1 - 04 - 3.4.

According to the proportion that obtains now amongst us, it was worth 1 - 00 - 9.

According to the Decuple proportion mentioned by Livy and Julius Pollux, it was worth 0 - 12 - u.

According to the proportion mentioned by Tactius, and which afterwards obtained, whereby the Aureus exchanged for 25 Denarii, it was worth 0 - 16 - 1.3.

Some alterations of the value of the Roman coin mentioned by Pliny.

In the reign of Servius:

A. Urb. 490. The As weighed 1 Pound.
A. Urb. 537. Of Brals 1 Ounce.
A. Urb. 586. 3/4 Ounce.
A. Urb. 537. Exchanged for 16 Asses.
Coin afterwards of the Pound of Gold 20 Denarii 1 Aureus.

In NERO'S time of the Pound of Gold 45 Denarii 1 Aureus.

The Roman manner of reckoning sums of money reduced to the English standard.

Sestertij nummi:

Sestertius .................. 6 - 00 - 3 1/4
Decem ........................ 0 - 01 - 07 - 1/2
Centum ........................ 0 - 16 - 01 - 3
Mille equal to a Sestertium .... 8 - 01 - 05 - 2

Sestertia:

Sestertium .................. 8 - 01 - 05 1/2
Decem ........................ 80 - 14 - 07
Centum, this sum the Romans express thus: 807 - 05 - 10
Debet milii centum, debet milii centum Sestertium vel debet centum millia Sestertium.
Mille ........................ 8072 - 18 - 04

Decies Sestertium &c.

The adverb Centes being understood.

Decies Sestertium vel 8072 - 18 - 04
Decies centena millia 8072 - 18 - 04
ornumnum.

Centes vel Centes H.S. 80729 - 03 - 04
Millies H.S ................ 807291 - 13 - 04
Millies Centes H.S ... 888020 - 16 - 08
The ROMAN manner of reckoning

INTEREST OF MONEY.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asses usurae vel Centesimae usurae</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Semissae usurae</td>
<td>1/2</td>
<td>6</td>
</tr>
<tr>
<td>Trientes usurae</td>
<td>1/3</td>
<td>4</td>
</tr>
<tr>
<td>Quadrantes usurae</td>
<td>1/4</td>
<td>3</td>
</tr>
<tr>
<td>Sextantes usurae</td>
<td>1/6</td>
<td>2</td>
</tr>
<tr>
<td>Unciae usurae</td>
<td>1/12</td>
<td>1 per Cent</td>
</tr>
<tr>
<td>Quincentes usurae</td>
<td>1/5</td>
<td>5 per Cent</td>
</tr>
<tr>
<td>Septunces usurae</td>
<td>1/7</td>
<td>7</td>
</tr>
<tr>
<td>Beslices usurae</td>
<td>1/23</td>
<td>8</td>
</tr>
<tr>
<td>Dodrantes usurae</td>
<td>1/45</td>
<td>9</td>
</tr>
<tr>
<td>Dextantes usurae</td>
<td>1/66</td>
<td>10</td>
</tr>
<tr>
<td>Deunxes usurae</td>
<td>1/12</td>
<td>11</td>
</tr>
</tbody>
</table>

JEWISH money reduced to the English Standard

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerah</td>
<td>00</td>
<td>00</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Bekah</td>
<td>00</td>
<td>01</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Shekel</td>
<td>00</td>
<td>02</td>
<td>3 3/4</td>
</tr>
<tr>
<td>Maneh</td>
<td>05</td>
<td>14</td>
<td>0 1/2</td>
</tr>
<tr>
<td>Mina Hebraica</td>
<td>34 2/3</td>
<td>0 3/9</td>
<td></td>
</tr>
<tr>
<td>Talent</td>
<td>54 7/8</td>
<td>0 0/6</td>
<td></td>
</tr>
</tbody>
</table>

Note: in all the Tables of money I reckon Silver at 5 Shillings and Gold 4 Pound the Ounce.
The EXPLANATION of some of ye more usual Characters
of Weights and Measures found in Greek & Roman Authors.

<table>
<thead>
<tr>
<th>Character</th>
<th>Greek/Latin</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphora</td>
<td>Κρ.μ.μετρύτης</td>
<td>P. A. Libra.</td>
</tr>
<tr>
<td>Urna</td>
<td>Χ...Χ forge</td>
<td>P.p. Dupondium.</td>
</tr>
<tr>
<td>Congius</td>
<td>Ε.Ε.ζέςθης</td>
<td>Uncia.</td>
</tr>
<tr>
<td>Sextarius</td>
<td>Χ...σοτονη</td>
<td>SS. Semiuncia.</td>
</tr>
<tr>
<td>Hemina</td>
<td>Ε...διςθαρον</td>
<td>Q. Sicilicus.</td>
</tr>
<tr>
<td>Quartarius</td>
<td>Κ...ωυθαθος</td>
<td>U. Sextula.</td>
</tr>
<tr>
<td>Cyathus</td>
<td>μ...μυρον</td>
<td>Δ. Drachma.</td>
</tr>
<tr>
<td>Modius</td>
<td>Χ...Χεμη</td>
<td>T., S.S. Scriptulus.</td>
</tr>
<tr>
<td>Semimodius</td>
<td>μ...μενηνος</td>
<td>Ω... Obolus.</td>
</tr>
<tr>
<td>Denarius</td>
<td>Χ...Χενις</td>
<td>N. Siliqua.</td>
</tr>
<tr>
<td>Gramm.</td>
<td>Γ. Bina Sextula.</td>
<td></td>
</tr>
<tr>
<td>Denarius</td>
<td>X X Denarius.</td>
<td>—. Drachmae Sex.</td>
</tr>
</tbody>
</table>

Those who do not understand Decimal Fractions, may observe that the Denominator of every such Decimal is an Unit with as many Cyphers as there are places of numbers in the fraction: thus in the second Table under Inch dec. 3,0218 signifies 3 Inches and 5818 of an Inch: 3,12 signifies 3 Inches and 18 of an Inch: 10.4 is 10 Inches and 4 &c. All other things in the Tables with their severall uses are plain.
### Decimal Tables

#### Roman Measures of Length

<table>
<thead>
<tr>
<th>Inches</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitus Transversus</td>
<td>0.72525</td>
</tr>
<tr>
<td>Vicia</td>
<td>0.967</td>
</tr>
<tr>
<td>Palmus minor</td>
<td>2.901</td>
</tr>
<tr>
<td>Paras</td>
<td>11.604</td>
</tr>
<tr>
<td>Paces</td>
<td></td>
</tr>
<tr>
<td>Palmipes</td>
<td>12.0875</td>
</tr>
<tr>
<td>Cubitus</td>
<td>14.505</td>
</tr>
<tr>
<td>Gradus</td>
<td>2.4175</td>
</tr>
<tr>
<td>Paces</td>
<td></td>
</tr>
<tr>
<td>Pajus</td>
<td>0.967</td>
</tr>
<tr>
<td>Stadium</td>
<td>120.875</td>
</tr>
<tr>
<td>Milliare</td>
<td>967.0</td>
</tr>
</tbody>
</table>

#### Scripture Measures of Length

<table>
<thead>
<tr>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit</td>
</tr>
<tr>
<td>Palm</td>
</tr>
<tr>
<td>Span</td>
</tr>
<tr>
<td>Feet</td>
</tr>
<tr>
<td>Lesser Cubit</td>
</tr>
<tr>
<td>Greater Cubit</td>
</tr>
<tr>
<td>Yards</td>
</tr>
<tr>
<td>Fathom</td>
</tr>
<tr>
<td>Ezekiel's Reed</td>
</tr>
</tbody>
</table>

#### Attic Measure for Things Dry

<table>
<thead>
<tr>
<th>Units</th>
<th>Pints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemina</td>
<td>0.5074</td>
</tr>
<tr>
<td>Sextarius</td>
<td>1.0148</td>
</tr>
<tr>
<td>Modus</td>
<td>1.0141</td>
</tr>
</tbody>
</table>

#### Jewish Measure for Things Dry

According to Josephus

<table>
<thead>
<tr>
<th>Units</th>
<th>Pints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gachal</td>
<td>0.1949</td>
</tr>
<tr>
<td>Cab</td>
<td>3.874</td>
</tr>
<tr>
<td>Gomer</td>
<td>7.0152</td>
</tr>
<tr>
<td>Peah</td>
<td>1.4615</td>
</tr>
<tr>
<td>Ephah</td>
<td>1.0961</td>
</tr>
<tr>
<td>Lecheh</td>
<td>5.4807</td>
</tr>
<tr>
<td>Corun</td>
<td>1.3702</td>
</tr>
<tr>
<td>Chomer</td>
<td></td>
</tr>
</tbody>
</table>

#### Roman Measures for Things Liquid

<table>
<thead>
<tr>
<th>Units</th>
<th>Pints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemina</td>
<td>0.59759</td>
</tr>
<tr>
<td>Sextarius</td>
<td>1.19518</td>
</tr>
<tr>
<td>Congius</td>
<td>7.1712</td>
</tr>
<tr>
<td>Irina</td>
<td>3.5857</td>
</tr>
<tr>
<td>Amphora</td>
<td>7.1712</td>
</tr>
<tr>
<td>Culius</td>
<td>2.273</td>
</tr>
</tbody>
</table>
Drachmæ or Denariiæ in Fractions of a Lib Sterling

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.32291667</td>
<td>2</td>
<td>0.64583333</td>
</tr>
<tr>
<td>3</td>
<td>0.96875000</td>
<td>4</td>
<td>1.29166667</td>
</tr>
<tr>
<td>5</td>
<td>1.61458333</td>
<td>6</td>
<td>1.93750000</td>
</tr>
<tr>
<td>7</td>
<td>2.26041667</td>
<td>8</td>
<td>2.58333333</td>
</tr>
<tr>
<td>9</td>
<td>2.90625000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Attick Measures for Things Liquid

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ἱστόν</td>
<td>0.5742 Pints</td>
</tr>
<tr>
<td>Εύσης</td>
<td>1,1483</td>
</tr>
<tr>
<td>Χόρας</td>
<td>6,8900</td>
</tr>
<tr>
<td>Μετοντῆς</td>
<td>10,335 Gallons</td>
</tr>
</tbody>
</table>

Jewish Measures for Things Liquid According to Josephus

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohr</td>
<td>0.8612 Pints</td>
</tr>
<tr>
<td>Log</td>
<td>1,1483</td>
</tr>
<tr>
<td>Cab</td>
<td>4,5933</td>
</tr>
<tr>
<td>Hin</td>
<td>1,7225 Gallons</td>
</tr>
<tr>
<td>Yeah</td>
<td>3,4450</td>
</tr>
<tr>
<td>Bath</td>
<td>10,335</td>
</tr>
<tr>
<td>Coron</td>
<td>1,6405 Hogshead</td>
</tr>
</tbody>
</table>

THE ANCIENT ARABIAN WEIGHTS REDUCED

To Troy Weights Lib Ounc. Penn. Grain

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kestuf</td>
<td>00_00_00_00_0_0528</td>
</tr>
<tr>
<td>2</td>
<td>kirat</td>
</tr>
<tr>
<td>4</td>
<td>2 Danich</td>
</tr>
<tr>
<td>6</td>
<td>3 1/2 Onolossat</td>
</tr>
<tr>
<td>12</td>
<td>6 3 2 Garne</td>
</tr>
<tr>
<td>36</td>
<td>18 9 6 3 Darchimi</td>
</tr>
<tr>
<td>41 1/2</td>
<td>20 1/2 10 1/2 6 1/2 3 1/2 1 1/2 Denarius</td>
</tr>
<tr>
<td>144</td>
<td>72 36 24 12 4 3 1/2 Sextarrium</td>
</tr>
<tr>
<td>288</td>
<td>144 72 48 24 8 7 2 Sacros</td>
</tr>
<tr>
<td>3456</td>
<td>1728 864 876 288 9 6 8 4 24 12 Ratel</td>
</tr>
<tr>
<td>4608</td>
<td>2304 1152 768 384 128 112 32 16 1 3/4 Alicatia</td>
</tr>
<tr>
<td></td>
<td>01_02_18_13 1/7</td>
</tr>
</tbody>
</table>
## Modern Measures

### Measures of Length of Several Countries, taken from Greaves, Mount, Boord, and Genthein, Reduced to English Feet & Inches

<table>
<thead>
<tr>
<th>Measure</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>English foot</td>
<td>1000.12</td>
</tr>
<tr>
<td>Paris foot</td>
<td>1068.12</td>
</tr>
<tr>
<td>Venetian foot</td>
<td>1162.13</td>
</tr>
<tr>
<td>Rhineland foot</td>
<td>1033.12</td>
</tr>
<tr>
<td>Strasburgh foot</td>
<td>952.112</td>
</tr>
<tr>
<td>Norembergh foot</td>
<td>1000.12</td>
</tr>
<tr>
<td>Damlick foot</td>
<td>944.11328</td>
</tr>
<tr>
<td>Danish foot</td>
<td>1042.12</td>
</tr>
<tr>
<td>Swedish foot</td>
<td>972.11,733</td>
</tr>
<tr>
<td>Dorahor Guilt of Cairo</td>
<td>1824.21,888</td>
</tr>
<tr>
<td>Perian Arish</td>
<td>3197.38,364</td>
</tr>
<tr>
<td>Greater Turkish Rike</td>
<td>220.026,4</td>
</tr>
<tr>
<td>Lesser Turkish Rike</td>
<td>2131.25,572</td>
</tr>
<tr>
<td>Braccio at Florence</td>
<td>1913.22,956</td>
</tr>
<tr>
<td>Braccio for Woolen at Siena</td>
<td>1242.14,904</td>
</tr>
<tr>
<td>Braccio for Linen at Siena</td>
<td>1974.23,688</td>
</tr>
<tr>
<td>Canna at Naples</td>
<td>6880.82,76</td>
</tr>
<tr>
<td>Vera at Almaria &amp; Gibrallar</td>
<td>2760.33,12</td>
</tr>
<tr>
<td>Palmo di Archetti at Rome</td>
<td>732.87,84</td>
</tr>
<tr>
<td>Canna di Archetti</td>
<td>7320.87,84</td>
</tr>
<tr>
<td>Palmo di Braccio di Mercantia</td>
<td>6952.83,46</td>
</tr>
<tr>
<td>Genoa Palm</td>
<td>685.97,8</td>
</tr>
<tr>
<td>Bolognian foot</td>
<td>1250.15</td>
</tr>
<tr>
<td>Antwerp (ll)</td>
<td>2283.27,396</td>
</tr>
<tr>
<td>Amsterdam (ll)</td>
<td>2268.27,216</td>
</tr>
<tr>
<td>Leyden (ll)</td>
<td>2260.27,12</td>
</tr>
<tr>
<td>Paris Drapers (ll)</td>
<td>3929.47,148</td>
</tr>
<tr>
<td>Paris Mercers (ll)</td>
<td>3937.47,244</td>
</tr>
</tbody>
</table>

### A Table of the Gold & Silver Weights of Several Countries, from Greaves given in Troy Grains English

<table>
<thead>
<tr>
<th>Grains</th>
<th>Grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roman Ounce</td>
<td>438</td>
</tr>
<tr>
<td>Roman pound of 12 Ounces</td>
<td>5256</td>
</tr>
<tr>
<td>Spanish Ounce</td>
<td>443\frac{1}{2}</td>
</tr>
<tr>
<td>Spanish pounds of 16 Ounces</td>
<td>7900</td>
</tr>
<tr>
<td>Venetian Ounce</td>
<td>460\frac{1}{2}</td>
</tr>
<tr>
<td>Venetian pounds of 12 Ounces</td>
<td>5528</td>
</tr>
<tr>
<td>Neapolitan Ounce</td>
<td>412\frac{1}{2}</td>
</tr>
<tr>
<td>Neapolitan pound of 12 Ounces</td>
<td>4950</td>
</tr>
<tr>
<td>Ounce at Florence, Aji &amp; Leghorn</td>
<td>440\frac{1}{2}</td>
</tr>
<tr>
<td>Their pound of 12 Ounces</td>
<td>5986</td>
</tr>
<tr>
<td>Ounce at Siena</td>
<td>431\frac{1}{4}</td>
</tr>
<tr>
<td>Siena pound of 12 Ounces</td>
<td>5178</td>
</tr>
<tr>
<td>The Ounce at Genoa</td>
<td>405\frac{1}{2}</td>
</tr>
<tr>
<td>The Dutch Ounce</td>
<td>570</td>
</tr>
<tr>
<td>The Turkish Okeu, of 400 Silver Drachma and 9128 The Silver Drachm in Turkey, Persia</td>
<td>347\frac{1}{2}</td>
</tr>
<tr>
<td>and the Mogul Country</td>
<td>53\frac{1}{2}</td>
</tr>
<tr>
<td>The Turkish Sultani, or Egyptian Sheriff, being a Gold Coin of the Same weight with 9 Venetian and 9 Barbary Chequins &amp; Norembergh Denar.</td>
<td>68,86\frac{1}{2}</td>
</tr>
<tr>
<td>The Cairo Rate of 44 Drachm</td>
<td>68,86\frac{1}{2}</td>
</tr>
<tr>
<td>The Damascus Rate of 72 Drachm</td>
<td>3443\frac{1}{2}</td>
</tr>
<tr>
<td>with which it is reputed they formerly weighed their Gold &amp; Silver</td>
<td></td>
</tr>
</tbody>
</table>

### The French Weights Reduced to Troy Weights

<table>
<thead>
<tr>
<th>Grain</th>
<th>0 0 0 0 0 0 10°</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 ½ Felin</td>
<td>0 0 0 0 0 0 10°</td>
</tr>
<tr>
<td>14 ¾ 2 Maille</td>
<td>0 0 0 0 0 11\frac{1}{2}</td>
</tr>
<tr>
<td>2 4 3 ½ Denier</td>
<td>0 0 0 0 0 19\frac{1}{10}</td>
</tr>
<tr>
<td>28 ½ 4 2 ½ Esterlin</td>
<td>0 0 0 0 0 23\frac{1}{6}</td>
</tr>
<tr>
<td>7 2 10 5 3 2 ¼ Grosse</td>
<td>0 0 0 0 0 21\frac{1}{12}</td>
</tr>
<tr>
<td>5 7 6 8 0 4 0 2 4 2 0 8 Ounce</td>
<td>0 0 0 0 0 16\frac{1}{2}</td>
</tr>
<tr>
<td>4 6 0 8 6 4 3 2 0 1 2 6 0 6 4 8 Marc</td>
<td>0 0 0 0 0 17\frac{1}{2}</td>
</tr>
<tr>
<td>9 2 6 0 2 8 0 6 4 3 8 4 3 2 0 1 2 8 1 6 2 Pound</td>
<td>0 0 0 0 0 15 0 0</td>
</tr>
</tbody>
</table>
The Cologn Weights Reduc'd to Troy Weights.

<table>
<thead>
<tr>
<th>Es</th>
<th>00 - 00 - 00 3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 Englisch</td>
<td>00 - 00 - 23 3/4</td>
</tr>
<tr>
<td>76 2 3/8 Drachm</td>
<td>00 - 02 - 08 15/32</td>
</tr>
<tr>
<td>304 9 1/4 Lothig</td>
<td>00 - 09 - 09 15/32</td>
</tr>
<tr>
<td>608 19 8 2 Ounce</td>
<td>00 - 18 - 19 3/8</td>
</tr>
<tr>
<td>486 452 64 16 8 Marc</td>
<td>07 - 10 - 11</td>
</tr>
</tbody>
</table>

Paris Measures Eng. Wine Measure:

- Chopine: 1 Pint
- Pint: 2 Pints
- Sextier: 2 Gallons
- Muid: 1 1/2 Hogshead

Stralsburg Measures

- Schopen: 0.8171 Pints
- Pint: 1.6342
- Maessen: 3.2684
- Ohman: 9.8052
- Tuder: 23.5325

OTHER MEASURES

- Paris Bois, 7,8534, solid Inches = 1 3/4 Pecks nearly.
- Stralsburgh Hall: Tater = 112,508, solid Inches = 2 1/3 Pecks.
- Stralsburgh Land: Tater = 116,004, solid Inches = 2 1/3 Pecks.
- The Arpenne or French Acre = 5,520,6 square English Feet = 1/4 English Acre.
- The Stralsburgh Acre = 21751 square English feet about half an English Acre.

The Vat in Germany called Weder made use of for keeping the Rhine and Most Wines doth ordinarily contain 14 Armes of Amsterdam, or 2 English Tuns.

The Arme of Amsterdam contains 8 Stockans or 20 Verges or Vertels being what in England is called a Tierce or 6 of a Tun of France or 1/6 of an English Tun.

The Stockan contains 16 Mingles, each of which make two Pints English.

The Hogshead of Bourdeaux, according to the just measure thereof, should contain 12 1/2 Stockans or 200 Mingles of Wine and Lee, and 12 Stockans or 192 Mingles clear Wine that is about 1/6 of an English Hogshead.

The Bourdeaux Tun of Wine should weigh with the Hogshead 2000 Pounds, and in Terms of Marine in Traighting of Ships by a Tun is meant 2000 weight there being reckoned 1/4 pound to the Hundred.

A Tun of France Contains 3 Muids or 3 1/4 English Hogsheads, that is 1/6 of an English Tun.
<table>
<thead>
<tr>
<th>Assay</th>
<th>Weight</th>
<th>Stand</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:08</td>
<td>4:08</td>
<td>4:08</td>
<td>4:08</td>
</tr>
<tr>
<td>3:11</td>
<td>3:11</td>
<td>3:11</td>
<td>3:11</td>
</tr>
<tr>
<td>1:72</td>
<td>1:72</td>
<td>1:72</td>
<td>1:72</td>
</tr>
<tr>
<td>2:05</td>
<td>2:05</td>
<td>2:05</td>
<td>2:05</td>
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<tr>
<td>2:05</td>
<td>2:05</td>
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<tr>
<td>2:05</td>
<td>2:05</td>
<td>2:05</td>
<td>2:05</td>
</tr>
</tbody>
</table>

MDCCLIV.
OBSERVATIONS
ON
Doctor ARBUTHNOT's
DISSERTATIONS
ON
COINS, WEIGHTS, and MEASURES.

By BENJAMIN LANGWITH, D.D.
Late Rector of Petworth in Sussex.

The SECOND EDITION.

LONDON:
Printed for D. Browne, without Temple-Bar; A. Millar, in the Strand;
and J. Whiston and B. White, in Fleet-Street.
MDCCCLIV.
To Her GRACE the
Duchess of SOMERSET.

MADAM,

I OFFER these Papers to You, because I have been long desirous of making a public Acknowledgement of the great Obligations the deceased Author and present Editor have owed to his Grace of SOMERSET, and Your Self. Was I as able to describe the Variety of Accomplishments You are Mistress of as I am ready to own the Favours I have received, You are the only Person in the World who would read them with Uneasiness; but my Incapacity to do Justice to Your Virtues, prevents my offending one which gives a Lustre to all
DEDICATION.

all the rest. However, Your Liberality and Benevolence which I have gratefully felt, tho' I cannot suitably express, shall live imprinted on the Mind of, MADAM,

YOUR GRACE'S

Most Obliged,

and most Obedient

Humble Servant,

Sarah Langwith.
OBSERVATIONS
ON
DOCTOR ARBUTHNOT's
DISSERTATIONS
ON
COINS, WEIGHTS, and MEASURES.

I am very much obliged to Dr. Arbuthnot for giving me more Light into many curious Subjects, than I could have had without much Expence of Time and Labour. But this has not hindered me from making the following Strictures upon some Parts of his Work, in Hopes that one time or other they may contribute to its being brought to more Exactness and Perfection.

CHAP. I.

Of the Roman Pound.

I am sorry to find, upon reading his Chapter of the Denarius, p. 15, that the Doctor has gone upon wrong Principles, and that his Tables of Weights and Coins are not only
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only loaded with useless Fractions, but are not so near the Truth as might be wish'd. The wrong Principles, those I mean which he had from Mr. Greaves, are as follow:

1. That the Roman Ounce is the same with the English Avoirdupois.

2. That the English Penny weighs eight Grains.

Mr. Greaves has been follow'd in the first of these Principles, not only by Dr. Arbuthnot, but by Bishop Hooper and Mr. Smith; tho' I believe it will be easy enough to prove it wrong. In order to this, let us first find the Value of the Avoirdupois Ounce; then that of the Roman in Grains Troy.

By an Experiment in Ward's Young Mathematician's Guide, p. 32, it appears, that a Pound Avoirdupois weighs 14 oz. 11 lbw. 15 1/2 gr. or 6999.5 Grains Troy.

He calls this Experiment a nice one, and I have Reason to believe it so, for I made the same myself, and find but a trifle of a Difference.

I fancy Mr. Greaves made the same Experiment, by weighing a Standard Avoirdupois Pound with Troy Weights; and was the first who determin'd the Proportion of the Avoirdupois Pound to the Troy Pound to be as 175 to 144, and consequently the Avoirdupois Ounce to be 437 1/2 Grains Troy, which differs very little from the Avoirdupois Ounce fetch'd out by Mr. Ward's Pound of 6999.5; for if 6999.5 be divided by 16, the Number of Ounces in an Avoirdupois Pound, it will give

The Avoirdupois Ounce 437.468, &c. Grains Troy, which falls short of the foremention'd Avoirdupois Ounce 437.5 by only 0.032 of a Grain. The foremention'd Proportion also is used by Bishop Hooper, but whence he had it we are not told. Vide Arbuthnot, p. 283.

As for Dr. Arbuthnot, in order to find the Avoirdupois Ounce, which he will have to be the Roman, tho' without any
Dissertations on Coins, Weights, &c.

any manner of Proof, he first makes use of the Proportion of the Avoirdupois Pound to the Troy Pound, as 175 to 144, which would bring out the Avoirdupois Ounce 437½ Grains Troy, and being multiply'd by 12 gives what he calls the Roman Pound.

Afterwards he changes his Proportion of the Pounds for a much worse, from Dr. Wybert, viz. instead of 175 to 144, he makes use of 17 to 14, throwing off the last Figures in the former Numbers.

By this Preparation, the Avoirdupois Ounce will come out 437.142 Grains Troy, and what he calls the Roman Pound 5245.704 Grains Troy, which he makes use of in his Tables. This new Avoirdupois Ounce of his, differs more from the true Avoirdupois Ounce, than the Former, for that differed from it only by 0.032 of a Grain, this by 0.326 of a Grain.

The Avoirdupois Ounce being thus settled at 437.468 Grains Troy, let us next enquire after

The Roman Ounce.

I know no better Way of coming to this, than by the Weight of the Denarius; for since it is agreed that 7 Denarii make an Ounce, if we have the Weight of the Denarius, we have that of the Ounce too. The Question is, how we shall know the Weight of the Denarius? One would think the Answer was easy. ——By weighing it.

This Mr. Greaves has done; and having in Italy, and elsewhere, perused many hundred Denarii Consulares, he found by frequent and exact Trials, the best of them to amount to 62 Grains Troy*. Surely this is a more natural

* The Denarius is certainly set high enough at 62 Grains, and it is not common to meet with one that weighs so much. I have but one in my Collection that comes near it; and in that great Number, whose Weights Mr. T'borne sent to Mr. Smith, there is but one of 62 Grains.
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tural way of coming at the Weight of the Consular Denarius than the round-about Methods by Vespasian's Congius, Inch Measure, &c. The Imperfections of some, or all of which, I shall shew hereafter.

I am sensible that Bishop Hooper sets the Denarius at 64 Grains; but I do not know how he could make it out, nor indeed how to reconcile this with his Notions, that the Avoirdupois Ounce consists of 437.5 Grains Troy, which it must do according to the Proportion which he makes use of, and the Supposal that the Roman and Avoirdupois Ounces are the same; for if the Roman Denarius be 64 Grains, the Ounce must be $64 \times 7 = 448$ Grains Troy, which exceeds his Avoirdupois or Roman Ounce, by no less than 10.5 Grains.

We are told of Denarii of very large Sizes by Mr. Thoresby; but these are nothing to the Purpose, since he himself neither takes them to be Consular, nor indeed so much as struck at Rome. Vide Duc. Leod.

Dr. Bernard is also quoted by Mr. Smith, p. 154, as having seen some Denarii of Drusus, which amounted to 62 gr. ½. I cannot help taking this to be accidental; however, it may well enough be accounted for. I suppose they were the Denarii of that Drusus, who, as we are told by Pliny, mixed no less than an eighth Part of Brass with the Silver: So that it is no wonder if he was not so nice in his Weight as to trouble himself about ½ of a Grain.

I shall therefore stick to 62 Grains Troy for the weight of the Denarius, at which Rate the Roman Ounce will be 434 Grains Troy, the Roman Pound 5208 Grains Troy, or 10 3

17 pw. Troy.

The Difference between the Roman and Avoirdupois Ounce will now plainly appear: For since the Roman Ounce contains only 434 Grains Troy, but the Avoirdupois 437.468, &c. the Avoirdupois Ounce will exceed the Roman by 3.468, &c. which does not seem to be much in the Ounce, but will make
make a great Difference when it comes to be multiplied by 12, or a greater Number.

Dr. Arbuthnot's Tables of Weights then are imperfect by his making the Roman Ounce, and consequently all the corresponding Weights, too heavy; for according to his Tables, the Ounce ought to be 437.142 Grains Troy; so that his Roman Ounce exceeds the true Roman Ounce of 434 Grains by 3.142 Grains Troy.

We must not yet dismiss this Point; for Mr. Greaves had so strong an Opinion, that the Roman Ounce, and Avoirdupois Ounce, was the same; that not being content with the Denarius of 62 Grains, with its corresponding Ounce 434 Grains, he casts about for a new Denarius, whose corresponding Ounce might be nearer the Avoirdupois Ounce. What this Denarius and Ounce were, we shall quickly see.

In the mean time, I cannot help wondering why Mr. Greaves, &c. should imagine we had our Avoirdupois Ounce from the Romans; for,

1. By the Name of it, I should imagine much rather, that we had it from the French.

2. If we had the Avoirdupois Ounce from the Romans, it is strange we had not the Pound too, which then would have consisted of 12 Ounces instead of 16.

3. It is plain it does not answer the Weight of the Consular Denarius. These are to me probable Arguments at least, that the Romans did not leave their Ounce in Britain, as Dr. Arbuthnot asserts.

I shall now proceed to Mr. Greaves's second Denarius, which is 62 ½ Grains Troy. This Denarius exceeds the Former by ½ of a Grain, which he is obliged to maintain, were lost in the Coins by the Coinage, &c. This Denarius is
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is fetched from the Congius of Vespasian, by Villalpandus, in the following manner:

The Congius called Vespasian's, being marked on the Outside P. X. is supposed to have contained ten Roman Pounds. This Vessel Villalpandus filled with Water, and found it to contain ten Roman Pounds, such as are used at present in Rome. He thence concludes, that the present Roman Pound, and the ancient Roman Pound, are the same. His Conclusion would be just, was it certain that the Congius was exact, and that the Experiments were made with that exquisite Nicety, that Experiments in weighing of Water, especially in such large cumbersome Vessels, require. Mr. Greaves, upon the Credit of Villalpandus [for I do not find that he weighed the Contents of the Congius himself] took the ancient Roman and present Roman Pound to be the same. After this I suppose he weighed the present Roman Pound with Troy Weights, and found it to contain 5256 Grains Troy, and consequently, that the Contents of the Congius being ten Pound, were 52560 Grains Troy. These 52560 Grains being divided by 840, the Number of the Denarius in 10 Roman Pounds, will give $62 \frac{30}{840}$, or $62 \frac{3}{4}$; for the Roman Denarius, whose correspondent Ounce will be 438 Grains Troy.

This Ounce from the Congius differs but little from the Avoirdupois Ounce 437.468, viz. 0.53, &c. of a Grain; so that they might well enough pass for the same, if so near an Agreement had been proved any other way. But I am afraid the Arguments taken from this Congius are far from being conclusive, and that for the following Reasons, which surely so curious and exact a Person as the excellent Mr. Greaves could not but have thought of, had he not been prejudiced in favour of an Opinion which is inconsistent with them.

Dissertations on Coins, Weights, &c.

The Reasons why I think the Arguments from the Congius inconclusive are,

I. In general, because I think no Water Measure can be exact, and that,

1. Because different Waters have different Weights, Rain-water differs from Spring-water, and the Water of one Spring from that of another.

2. Because the Weather makes an Alteration in the Weight of Water, since, according to Mr. Homberg, the same Quantity of Water [I suppose he means of the same Kind of Water] which in Winter weighed 474 Grains, weighed in Summer only 470 Grains, and consequently lost something above \(\frac{1}{118}\) Part of its Weight. Vide Arbuthnot, p. 82.

3. Because there is much Difficulty in filling Vessels with Water to great Exactness; for if the Vessel be well dried and cleansed with Bran or Flower, the Water will stand in a Crown above the Brims, and be heavier than the Dimensions of the Vessel require; but if this Water be taken off with a Strike, it will not touch the Brims of the Vessel, and so be lighter than the Dimensions of it require. Thus much as to the Uncertainty of Water-Measure in general. I come to consider,

II. Why Arguments from this Congius, in particular, are inconclusive; and that,

1. Because it is neither rectangular nor cylindrical, but bulges out in the Belly, and therefore could never be designed for an exact Measure, since without a great deal of Trouble, Part of the Liquor in pouring it out would be left behind. Perhaps they made it larger than ordinary, partly to allow for this Inconvenience, and partly to allow for the Liquor.
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Liquor that might be dashed about in pouring it in and out; for that it was larger than ordinary, is certain;

3. Because the Denarius and Ounce taken from it are larger than ordinary.

4. Because the Foot taken from it is larger than ordinary; for the Foot taken from this Congius would be 11.84 Inches, differing from the Coffitian Foot by an excess of near 1/3 of an Inch. Vide Arbuthnot, p. 81.

5. What is worst of all, it is suspected to be spurious. Vide Gruter Inscript. vol. i. p. 233. Though no Reasons are offered there why it is suspected, yet to say nothing of the absurd improper Figure of it, I think a very good Argument to prove it a Counterfeit may be taken from the Inscription upon it, which runs thus:

IMP. CAESARE
VESPAS. VI. COS
T. CAES. AVG. F. III
MENS VRAE
EXACTAE IN
CAPITOLIO
P. X

To say nothing of the other Parts of the Inscription which are suspicious enough, the Omission of COS in the third Line before III. is sufficient for me to judge it spurious. I think at least, it is not of Authority enough to support the Notion grounded upon it, that the Avoirdupois and Roman Ounces are the same. I have also shewed the Mischief that Dr. Arbuthnot has done his Tables by falling into this Error.

There is still another Estimate of the Denarius at p. 15, from a Model of the Congius of Vespasian, which is hardly worth mentioning. This makes the Denarius $62\frac{161}{430}$, or 62.839 Grains Troy. At this Rate, the Ounce will be 439.873, and the Pound 5278.476 Grains Troy.
By setting, as I have done, the Roman Ounce at 434 Grains Troy, and the Roman Pound at 5208 Grains Troy, neither the Ounce nor the Pound are incumbered with Fractions, which cannot be said either of Dr. Arbuthnot's Ounce or Pound.

It may perhaps create a Prejudice to my Estimate of the Roman Ounce and Denarius, when it is considered that such great Men as Mr. Greaves, Bishop Hooper, and Dr. Arbuthnot have set them higher than I have done. In order to balance these great Authorities, I shall take in the Assistance of Lucas Patus, and Savotus, two very learned Men, and curious Observers, whose Ounce and Denarius are much lower than mine.

1. As to Patus, he tried a very nice Experiment with an Amphora, made by the Roman Foot, and a proportionable Sextarius, of which an Account may be met with in Ward de Asse, p. 48. The Result of his Experiment was, that the Roman Pound consisted of 5000.5 Grains Troy. This Pound, which is lighter than Mr. Greaves's of 5256 by 255.5 Grains, will give the Ounce 416.708 Grains, and the Denarius 59.529 Grains Troy.

2. Savotus makes this still too much, and by weighing many Gold and Silver Coins, concludes, that 68 of our Grains Troy are to be taken from Patus's Pound, in order to bring it right. Thus his Roman Pound will be 4932.5, his Ounce precisely 411.041 Grains Troy, his Denarius 58.72 Grains Troy.

Patus's Pound of 5000.5 falls short of mine 5208 by 207.5 Grains Troy.

Savotus's of 4932.5 Grains Troy falls short of mine by 275.5; So that according to them my Pound is much too large; and instead of falling short of Mr. Greaves's, by only 48 Grains Troy, it ought to do it by 4 or 5 times as much.
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The same may be said in proportion of the Ounce and Denarius.

I shall not however quit my Estimate of the Ounce, &c. for either of theirs.

1. Not for Pataus's: I do not doubt of the exceeding great Care and Exactness of Pataus; but, for Reasons given before, I cannot think Water-weight any thing near so exact as solid Weight. But there is another Objection against his Estimate; for it is very doubtful whether the Amphora from the Foot be exact. It certainly comes near the Amphora found by Weight, but cannot be proved to be the same. Vide Bishop Hooper in Arbuthnot, p. 81. It seems to be something less, and so brings down the Weight of the Ounce, &c.

2. As to Saviotus, he is an Adversary worse to manage, for his exquisite Nicety about Coins is well known; and he fetched out his Pound, &c. by weighing Gold and Silver Coins; so that it is strange that his Denarius should differ so much from Mr. Greaves's of 62 Grains Troy. All that I can say to it is, that either the Coins he met with were not so perfect as Mr. Greaves's, or else, that having weighed several, he chose to set them at some middle Rate, rather than at the highest or the lowest.

I shall just take notice, that the As Libralis, even when fair, does not weigh above 9 Ounces Troy, which is a probable Argument, at least, that my Pound is not set too low at 10 3, 17 pn.

Several of these Particulars may be seen in Mr. Ward's Dissertation de Asse, in Monument. Kempian. from p. 46, to p. 62. And yet after all, this Author chooses to stick to Mr. Greaves's Computation; and that for a very odd Reason, viz. that it is used by our Authors, particularly Dr. Arbuthnot; as if it was not better to correct our Authors, and, particularly, Dr.
Dissertations on Coins, Weights, &c.

Dr. Arbuthnot as well as the rest, than follow them in their Errors.

The Computation that he talks of, is that which sets the Denarius as 62½ Grains Troy, and the Penny at 8 Grains; which latter is undoubtedly false, as I shall shew, after having given the Pounds, Ounces, and Denarii mention'd in these Papers at one View.

<table>
<thead>
<tr>
<th>Pound</th>
<th>Ounce</th>
<th>Denarius</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greaves's Computation from Villalpandus gives, - - -</td>
<td>5256</td>
<td>438</td>
</tr>
<tr>
<td>Dr. Arbuthnot's, - - -</td>
<td>5245.752</td>
<td>437.142</td>
</tr>
<tr>
<td>Mine from the Denarius - - 5208</td>
<td></td>
<td>434</td>
</tr>
<tr>
<td>Petus's, - - - - - - 5000.5</td>
<td></td>
<td>416.708</td>
</tr>
<tr>
<td>Savutus's, - - - - - - 4932.5</td>
<td></td>
<td>411.041</td>
</tr>
<tr>
<td>Another in Arbuthnot, - - - 5250</td>
<td></td>
<td>437.5</td>
</tr>
</tbody>
</table>

I wonder the Doctor did not stick to this Pound, which is a whole Number, especially, since the Ounce of it is near the Avoirdupois Ounce, which he takes to be the Roman.

The Difference between his Pound of 5245.752, &c. mine 5208 is 37.752, &c. Grains Troy, which is little more than $\frac{1}{12}$ of a Pound Troy; consequently in a little more than 152 Pounds Weight, his would exceed mine by a Pound Troy. I think I have proved mine to be the true Roman Pound; and if I have, it is plain that his is too heavy. It is plain also from what went before, that his Over-weight was chiefly owing to his following Mr. Greaves in his Notion, that the Roman Ounce and Avoirdupois Ounce are the same.

I shall now give an Account of the Roman Weights according to my Computation, and then shall proceed to the Consideration of his second general Mistake, which has spoiled his Tables of Money, as the first did those of Weight.
My Roman Pound, is - 5208 | 10 | 17 | 00
Ounce, - - 434 | 00 | 18 | 02
Duelle, - - 144 1/2 | 00 | 06 | 00 1/2
Sicilicus, - - 108 1/2 | 00 | 04 | 12 1/2
Sextula, - - 72 1/2 | 00 | 03 | 00 1/2
Drachma, - - 54 3/4 | 00 | 02 | 06 3/4
Scriptulum - 18 1/2 | 00 | 00 | 18 1/2
Obolus, - - 9 1/16 | 00 | 00 | 9 1/16
Siliqua, - - 3 7/8 | 00 | 00 | 3 7/8
Lens, - - 0 217/238 | 00 | 00 | 0 217/238

I am aware that it would have been better to have thrown the common Fractions into the Decimals in this Table; but I have drawn it up in this manner to make it more easy to be compared with Dr. Arbuthnot's.

This over-rating the Roman Weights, will occasion Disorder in the Estimate of the Measures both wet and dry.
CHAP. II.

Of the Value of Roman Money in English Coin.

I SAID in the Beginning of the last Chapter that the Doctor's Tables of Coins are not so exact as might be wish'd, which was partly occasion'd by his following Mr. Greaves in two Inaccuracies. The first has been treated of.

The second is, That he has set the English Penny at 8 Grains Troy, and in consequence the Denarius at 7 d. ½ English; which is too low.

If a Pound Sterling of Silver was coin'd into 60 Shillings, or what is the same thing, the Ounce of Silver, into 60 Pence, then indeed the Penny would be 8 Grains Troy.

For as 60 d. : 480 gr. :: 1 d. : 8 gr. thus also as 480 gr. : 60 d. :: 62 gr. : 7 d. ½

Both Dr. Arbuthnot and Mr. Greaves, knew well enough that an Ounce was coin'd into 62 Pence; but in order to save a little Trouble in Calculation, set it at 60 Pence. They would have saved a great deal more Trouble by setting it right; since by that the Denarius would have come out at about 8 d. the Quinarius at 4 d. and the Sesterius, by which all great Sums are estimated, at the round Number 2 d. which may be thus made out:

If 480 the Number of Grains Troy in an Ounce give 62 Pence, then will 62 Grains, which are contain'd in a Denarius, give 8.008, &c.
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\[
\begin{align*}
gr. & \quad d. & \quad gr. & \quad d. \\
As 480 : 62 & : : 62 : 8.008, \text{ or,} \\
As 480 : 62 & : : 62 : 8 \frac{1}{12}.
\end{align*}
\]

The Fraction 0.008 or \(\frac{1}{120}\) may well enough be omitted, tho’ in 120 Denarii it would amount to an English Penny. It is certain from Pliny, Edit. Hard. Tom. I. p. 627, Fol. that the Mint-Masters did not always make the Denarii of the just Weight, which perhaps may be one Reason why amongst the many fair Consular Denarii, as they are called, so few come up to the Weight of 62 Grains Troy.

I shall conclude therefore, that the Denarius is 8 Pence, that it is set a Farthing too low at 7d. \(\frac{1}{3}\), and the Sestertius a Quarter of a Farthing too low at 1d. 3f. \(\frac{3}{4}\).

A Quarter of a Farthing seems to be an inconsiderable Thing; but when it comes to be multiplied, as the Sums which we often meet with in the Roman History require, it will then appear to be of more Consequence. I shall instance only in Centies H. S. which was no uncommon Estate among the Romans after the Conquest of Carthage, Greece, Asia, &c. Centies H. S. supposing the Sestertius to be 1d. 3f. \(\frac{3}{4}\), would amount to 80729l. 3s. 4d. but setting the Sestertius \(\frac{1}{4}\) of a Farthing higher, or, in other Words, at 2d. the Sum will be 83333l. 6s. 8d. the Difference 2604l. 3s. 4d.

The former Conclusion will be confirm’d, by considering what the real Weight and Value of the 60 Pence or Crown, and Penny will be, when the Ounce is coin’d into 62 Pence: The Value of the Crown in this Case will be no more than 58 d. and about \(\frac{1}{4}\) of a Farthing, the Weight of it no more than 19 pw. 8 gr. \(\frac{1}{3}\), with some exceeding small Fraction. The Penny at the same Rate will be no more in Value than 3f. \(\frac{3}{4}\), supposing the Ounce to be 60 Pence, nor in Weight than 7gr. \(\frac{4}{5}\), or 7 gr. 74, &c. so that it was over-rated in Weight by
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by Mr. Greaves and Dr. Arbuthnot, something more than a Quarter of a Grain, viz. $\frac{\text{d}r}{16} = 0.26$; which in 8 d. would amount to $0.26 \times 8 = 2.08$, something above a Farthing.

The Denarius being thus settled at 8 d. of our Money, the Roman Libra of Silver 5208 Grains Troy will be $8 \times 7 \times 12 = 672 = 56 = 2 \times 16$ o.

\[
\begin{array}{cccc}
\text{l.} & \text{s.} & \text{d.} & \text{f.} \\
\hline
\text{Denarius,} & - & - & - & 0 0 8 0 \\
\text{Quinarius,} & - & - & - & = \frac{1}{8} 0 0 4 0 \\
\text{Sestertius,} & - & - & - & = \frac{1}{4} 0 0 2 0 \\
\text{As,} & - & - & - & = \frac{1}{10} 0 0 0 \ 3\frac{1}{2} \\
\text{Sembella,} & - & - & - & = \frac{1}{20} 0 0 0 \ 1\frac{3}{2} \\
\text{Teruntius,} & - & - & - & = \frac{1}{40} 0 0 0 \ 0\frac{1}{2} \\
\end{array}
\]

Mr. Smith has calculated a large Table of Roman Sums, at the Rate of 2 d. the Sestertius. I wish this had been done by a more exact Author; for his Numbers are so faulty in many Parts of his Book, that I am afraid the Tables are hardly to be depended upon.

CHAP.
CHAP. III.

Further Considerations upon the Value of the Denarius.

I THINK the Denarius is rightly adjusted to our Money in these Papers; but it is upon a Supposition that the Denarius is of its just Weight 62 Grains Troy, and of the fame Fineness of the English Coin; for a Difference in either of these Particulars must occasion an Alteration in the Estimate.

As to the former of these; 'tis certain that many of the Roman Denarii fall short of this Weight by several Grains, which yet might have had it at their first Coinage, such a Loss being easily accounted for by wearing, and other Accidents, in so many Hundred Years. It is no more, in very many of them, than what has happened to a less Coin of our own in a very few Years; for I have just now weigh'd an English Sixpence of King William's, that has lost seven Grains of its due Weight, and I don't doubt but that there are many which have lost eight.

I cannot, however, be certain that all the Denarii had their just Weight even in the Time of the Consuls, from a remarkable Place in Pliny, which I shall transcribe at length, since I shall have further Occasion to make use of it. Vide Plin. Edit. Hard. Tom. ii. p. 627, and runs thus: Miscuit denario Triumvir Antonius ferrum. Miscenetur aer falsae monetae. Alii e pondere subtrabunt, cum sit justum 84 e libris signari. Igitur ars fææ denarios probare, tam jucunda lege plebi, ut Mario Gratidiano vicatim totas statuas dicaverit.

As to the second of these Particulars, the Fineness of the Silver, the Antiquarians are not well agreed about it. Savo-
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...us, whose Judgment in those Particulars is much to be relied on, says, "La plupart des metalls et monneys antiques Romains ont été battues sur le fin." Vide Rink. p. 52.

I am obliged to quote Rink for this, as not having Savotus by me; and indeed I suspect it relates chiefly to the Gold Coins, which were generally of the purest Gold. Vide Joubert, p. 17. As to the Silver, the same Author maintains that the best of the Consular Denarius fall short of the French Standard, which as well as the Spanish is nearly the same with ours, by 1/4 Part. At this Rate, since our Standard has about 1/11 part of Alloy in it, the Alloy of the Roman Denarius would have 1/5 + 1/11 Parts of Alloy in it, which two Fractions added together make 1/4 and above 1/3 of Alloy.

What Experiments were made by Mr. Joubert to come at this Conclusion I cannot tell; but I am afraid they were not made upon a sufficient Number of Coins, or not made with due Exactness; for it will quickly appear by the Trials that I made, that the best of the Consular Coins are so far from sinking so strangely below our Standard, that they equal, or even exceed it. This I think conclusive against Mr. Joubert.

As a probable Argument against him, I might take notice that the greatest Debasement that we read of the Silver in the Roman Denarius, was made by the Tribune Livius Drusus, who mixed an eighth Part of Brass with Silver, A. U. C. 663, during the Consulate of Lucius Marcus Philippus, and Sextus Julius. Vide Plin. Edit. Hard. fol. Tom. ii. p. 612. We are told that the Brass was of the purest; but we are not told what the Silver was; but surely it could not be so base, however, as to sink to Mr. Joubert's Proportion of Alloy. I shall try this afterwards.

There are sufficient Reasons to think that the Romans were but poor Masters at refining of Silver, which might possibly occasion a Difference in the Goodness of their Coins, by trusting
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... trusting to Chance for want of a certain Standard. They were able to manage Gold well enough, to which they could not give too much Fire. Silver Ore requires a great deal more Art to bring it to Perfection without great Loss, than they ever seem to have been Masters of. What has been often observed in England does no great Credit to the Roman Skill in the Management of their Metals; for the Cinders of some old Iron-works, supposed to be theirs, still contain in them such a considerable Quantity of good Iron that they are melted over again, in order to extract it.

The finest Brass seems to have been less weighty than our Copper, especially if the specific Gravity of it be set at 9.000, which I own I think too much; because the Estimate seems to have been made from Pieces of Coin. The violent Force which is used in Coinage, makes the Parts of the Metal lie closer, and thus increases the specific Gravity. The specific Gravity of a Silver Half-Crown of William III's, in Harris's Tables of specific Gravity, is set at 10.75, whereas, at the Rate of our Standard, it ought to be no more than 10.535. I should rather chose therefore to set the specific Gravity of Copper at 8.843, and have just Reason to imagine from the specific Gravity of some of the following Coins, that the Roman Aes purissimum did not come up even to that.

In order to obtain some Insight into this Matter, I took five Consular Denarii and weighed them carefully; first in Air, then in Water, that I might not only have their Weights, but their specific Gravities.

1. This was a very fair Coin, serrated, and well preserved. It has on one Side the Head of Jupiter, in whose Face is a wonderful Mixture of Sweetness and Majesty; at the back of the Head is S. C. and under it O, I suppose for Senatus Consulato. On the Reverse is a Victory driving a Quadriga. The Letters in the Exergue are so confused and imperfect, that
Dissertations on Coins, Weights, &c.

that it requires better Eyes than mine to make them out. By the Inscription S. C. O. the Coin was struck by the Authority of the Senate, which perhaps made the Mint-masters more careful, than when they wrought by the Authority of the Consuls, Prætors, Ædiles, &c. as they did sometimes. Vide Rink, p. 123.

The Weight of this Coin, in Air, is — — — 61.625
in Water, — — — 55.875

Difference — — — 5.750

The Way to find the Specific Gravity is this: As the Difference between the Weight in Air and Water is to the Weight in Air, so is 1.000 to the Number sought. Thus as 5.750 : 61.625 :: 1.000 : 10.717, &c. Which last Number 10.717, shews the Specific Gravity. Since the Specific Gravity of our Standard Silver, is generally set at 10.535, it seems at first Sight as if this Coin considerably exceeded our Standard. Yet if we consider the Specific Gravity of King William's Half-crown, mentioned before, at 10.75, it will appear that this Denarius is exceeded by it but a Trifle. Nay, since this Denarius has a very bold Relief, it must have been compress'd and condens'd so much in the Coinage, that it is a Question whether the Metal of it before Stamping, was any thing heavier than our Standard.

This Coin is specifically heavier than any of those that follow; consequently it is of finer Silver: For an Alloy of any Bafe Metal will make Silver lighter, Lead only excepted: But we have Savotus's Word for it, that in his Effays on Antient Coins, he never met with a Grain of Lead in any of them before the Time of Septimius Severus, when a Mixture of Brass and Lead was made use of to allay the Silver. Vide Joubert. p. 22.

D 2

This
Observations on Dr. Arbuthnot's Coin.

This Coin is so remarkable, that I cannot leave it without some further Observations.

1. That as it, after so many Ages, falls short of 62 Grains Troy, only by 1/4 of a Grain; I think no Doubt can be made but that it must have weighed full 62 Grains.

2. That as it is a Nummus Serratus, and yet comes so near its full Weight, it must either have been notch'd at the Mint before it was delivered out, or notch'd with a Chizzel so as to make little Loss; or, lastly, that it weighed when it was coin'd, considerably more than it does now.

3. That tho' this, and some other Coins of the Consular Kind, may weigh about 62 Grains Troy, and be nearly about the Fineness of our Standard, and so be worth about 3/4 of our Money; yet I own, that much the greatest Part of them fall short, either in Purity or Weight: The Reasons of which are partly to be collected from the above-cited Place in Pliny, as also from the Effects of Time, Wearing, Rust, and other Accidents. I take this first to have been a Denarius in Perfection, according to the Notion of the Romans; and upon such Denarii I have founded my Computation.

I took notice that the specific Gravity of Metals may be increased by the Compression in Coinage. This may be confirmed by what happens in other Cases. The specific Gravity of cast Brass, for instance, is but 8.000, or at most 8.100; whereas the specific Gravity of hammer'd Brass is 8.349.

I shall call this first Coin Jupiter.

The second I examin'd was a fair one, and but little worn; which had on one Side a Head, I think, surrounded with a Diadem; behind it is a Lituus, below it the Inscription ANGUS. On the Reverse is a Man on Horseback with a Dog.
Dissertations on Coins, Weights, &c.

Dog, as I take it, below. To the left of this Figure, in the Inscription Philippus. Immediately below the Horse and seemingly contiguous to it, is an Aqueduct among the Arches, on which is A Q V A M A R C I A.

gr.  

The Weight of this Denarius, in Air - 59.625  
in Water - 53.375  

Difference - 6.250

The Proportion for finding the specific Gravity, is as 6.250 : 59.625 :: 1.000 : 9.54.

I made two other Trials, one of which brought out the specific Gravity 9.44, the other something less; so that I shall pitch upon 9.44, as most likely to be exact; tho' indeed there is very little Difference between any of the three. This specific Gravity is less than that of any of the following Coins, and much less than some of them; and indeed I have Reason to think it one of them which Livius Drusus allay'd with an eighth Part of fine Brass; which, as we are told by Pliny, he did. It must however be observed, if his Brass was as heavy as our Copper at 9.000, his Silver must have been very impure, which may then be made out:

Suppose 8 Parts of Metal, 7 of which are of Silver and one of Copper, which last has for its specific Gravity 9.000. If we suppose the Silver at 9.5, the Compound of the two will have exactly 9.4375 for its specific Gravity; which will appear by multiplying 9.5 into 7, the Number of Parts of Silver, which gives 66.5, to this is to be added 9.000 for the Single Part of Copper, in all 75.5, which being divided by 8, gives 9.4375. This specific Gravity 9.4375, is the same within a Trifle with that Ancus was set at, viz. 9.44.
Observations on Dr. Arbuthnot's

Were we to debase the Copper to 8,000, the specific Gravity of this Silver would be near 9·6. If the Copper was supposed still lighter, and set only at 7,000 the specific Gravity of the Silver would not be quite 9·8. Upon the Whole it is evident, that if the Brass was pure, the Silver was very base; and if we suppose the Brass to be so debased as to have only the specific Gravity 7,000, the Silver would be then also base, since it would fall short of the Standard of pure Silver 11·091 by [11·091 - 9·8 =] 1·291. It would also fall short of our Standard, even of uncoin’d Silver, 10·535 by 0·735, and of our coin’d Silver 10·535 by 0·95.

I shall conclude, upon the Whole, that this was one of Drusus's Denarii, and that in Compliment to one of that Year’s Consuls, Lucius Marcius Philippus, whose Family might possibly pretend to be derived from Ancus Marcius, the King's Head of that Name was stamp'd upon one side of the Coin, and on the other Aqua Marcia, with the Name Philippus.

I think it worth taking notice of, that here is no more of the Consul’s Name upon this Coin than barely PHILIPPVS, without the Title of COS: For tho' the Romans suffer'd the Triumviri Monetarii to set their Names, and little Titles, upon their Coins, yet they were shy of the great Magistrates, Consuls, Tribunes, &c. whose Names and Titles never appear'd upon any Coins struck in their own Times, till the Decay of the Commonwealth.

As I think it very plain, that this Denarius was one of those of Livius Drusus, so I think it probable that the other was one of those struck by the Authority of the Senate; who after they had abrogated all the Constitutions of Drusus by one Decree, seem to have taken the Coinage into their own Hands, and to have raised the Coin to as great a Degree of Perfection as ever it had before, if not greater. I shall call this Coin Ancus.
Dissertations on Coins, Weights, &c. 23

The third Denarius that I shall consider has a Head of Roma on one Side, having on a Helmet with Wings annexed. The Inscription is ROMA. On the Reverse is a Victory and a Quadriga. In the Exergue is the Inscription M. TVLL.

The Weight of this in Air  -  -  57.875
Water  -  -  52.125

Difference  -  -  5.750

The specific Gravity  -  10.0652, &c.  -  For as 5.75 : 57.875 : : 1.000 : 10.0652, &c.

Notwithstanding we are able to find the specific Gravity and Weight of this, and the two following Pieces, yet we are more at a Loss to tell their Value in English Money, or indeed their Proportion to one another in Goodness, than in the former Coin; for in that we were told that the Alloy was of pure Brass, which was of some Assistance in judging what was the Value of the Silver; but in these, supposing they were alloy'd with Brass, as it is probable they were, yet since we neither know the specific Gravity of the Brass, nor of the Silver that is mix'd with it, we can be at no manner of Certainty. I shall therefore content myself with giving their specific Gravities and Weights, by the former of which we shall know, how much the Mixture falls short in Weight of pure or Standard Silver. I shall call this Coin Roma the bigger, or Roma Alata.

The fourth Denarius that I tried has no Alae annexed to the Helmet, as far as I can see; I shall therefore call this only simply Roma. Upon the back of the Head is X, for Denarius. There are either Bigae or Quadrige on the Reverse.
Observations on Dr. Arbuthnot's
verse, but the Coin is so much worn, that I cannot tell which; nor can I make out any Letters but the X.

This Coin weighs in Air - - - 52.25
   Water - - - 47.25
   Difference - - - 5.00

Specific Gravity 10.45

The fifth Denarius has upon one side, what Hardouin calls Caput barbarum [perhaps for barbatum] & ignotum: But, for my Part, I take it to be Jupiter under the Notion of Pan, who upon this Account hath a longer and sharper Beard than ordinary given him. Vide Collier's Appendix, under the Word Pan.

I suppose Pansa chose Pan, because it had some Affinity to his own Name. There are many Instances to shew how fond even the Romans' were of Rebus's, little Allusions, &c. The first of the Cæsars, who had any thing relating to him stamped upon the Coin, was sadly put to it, when he was forced to run to the Punic Language for the Word Cæsar; which in that Tongue signified an Elephant. However, when he had once made himself Master of that lucky Discovery, he put an Elephant instead of his own Name upon the Coin. Cicero's Citer, &c. shew the Humour of a People, whose fine Taste did not hinder them from relishing such things as we justly take to be Puerile.

The Reverse of this Coin has Jupiter sitting half naked; his Right-hand stretched out, and seems to me to hold a Patera; tho' Hardouin, whose Coin was fairer than mine, takes no Notice of it. In his Left-hand he has a Hafta Pura. The Inscription in mine is only, IOVIS AXVR, the rest of the Letters are worn away, but may be seen in Hardouin on Pliny, together with an Interpretation of IOVIS AXVR, which
which is too whimsical to be repeated, much less confuted.

The conceited Positiveness of Hardouin's Countryman * Ruae upon Virgil's Jupiter Anxurus, is very remarkable; who from this very Coin concludes, that Jupiter Anxurus had a Beard, and vilifies Servius, &c. for holding the contrary: And yet is is evident that the Inscription Jovis Axur runs round the Figure without a Beard, Jovis nondum barbati; and therefore belongs to that, and not to the Head on the other Side.

This Coin is very remarkable upon one Account; for it will go a great way towards deciding a Dispute among the Antiquarians, viz. Whether there were ever struck more than one Coin with the same Die; for I have two of the Pansa which agree with one another to a Tittle, and both of them with Hardouin's Pansa in those Parts that are fair and distinct. Indeed I could never be of the Opinion of those against whom this Argument is levelled; for at this Rate the Charge of Coinage must have, by many Degrees, exceeded the Value of the Pieces coin'd, which would have been an Expence altogether incredible, needless and ridiculous.

<table>
<thead>
<tr>
<th>Panxa weighs in Air</th>
<th>53.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>47.625</td>
</tr>
<tr>
<td>Difference</td>
<td>5.375</td>
</tr>
</tbody>
</table>

Specific Gravity 9.860, &c.

* Æn. vii. 799.
The Weights of these Coins are as follow:

<table>
<thead>
<tr>
<th></th>
<th>gr.</th>
<th>fp.Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jupiter</td>
<td>-61.625</td>
<td>10.717</td>
</tr>
<tr>
<td>Roma</td>
<td>-52.25</td>
<td>10.45</td>
</tr>
<tr>
<td>Roma alata</td>
<td>57.875</td>
<td>10.0652</td>
</tr>
<tr>
<td>Pansa</td>
<td>-53.000</td>
<td>9.86</td>
</tr>
<tr>
<td>Ancus</td>
<td>-59.625</td>
<td>9.54</td>
</tr>
</tbody>
</table>

I perceive by this Table, that Mr. Joubert was wrong in saying that the best of the Consular Coins fell short of our Standard by a Part, but it is true enough of the middling ones; for it will appear that Mr. Joubert's Proportion will bring out the specific Gravity 10.279, which is less than the specific Gravity of Jupiter and Roma, but greater than that of any of the rest. According to Mr. Joubert, there are in the Consular Denarius 5 Parts of Silver, at 10.535 specific Gravity, and one Part of Alloy, which if it be of fine Copper, will have the specific Gravity 9.000.

Let 10.535 be multiply'd by 5, the Number of Parts of Silver, it gives 52.675
To which if we add for the one Part of Copper 9.000

They will make 61.675

Which being divided by 6, the whole Number of Parts, it will give 10.279, the specific Gravity, as above.

The Copper is set rather too high at 9.000, for Reasons given before; but if it were reduced to 8.000, it would give for the specific Gravity 10.1125, which still exceeds the specific Gravity of all the Denarii but the two first.

Upon
Dissertations on Coins, Weights, &c.

Upon the Review of the Whole, it may be observed,

1st. That the ancient Consular Denarius was about as fine as our Standard, and probably continued in that State till it was adulterated by Livius Drusus. This happen'd A. U. C. 663. Silver was first coin'd at Rome, A. U. C. 485, as we are inform'd by Pliny, Edit. Hard. Fol. Tom. ii. p. 610; so that there was a Run of good Silver 178 Years. After the Debasement by Drusus, the Senate seem to have restored the Money, at least to its former Purity, in which State it probably continued for some time: I say at least to its former Purity; for those of the most antient Consular Coins, which were such as had the * Roma alata upon them in my Collection, do not come so near our Standard as Jupiter, which is a Nummus Serratius, and was probably struck about this time; for Marius Gratidianus is supposed to have been the Inventor of the Nummi Serrati, which after the Fineness of the Coin was restored, was designed to prevent Counterfeits. The Design had its Effect for some time; but the false Coiners afterwards made a Shift to imitate them; so that they were forced to have Recourse to making Holes in them, as was practised in England in our Time. Vide Rink, p. 65. However, Marius Gratidianus grew extremely popular by his Invention, which yet did not secure him from being barbarously butcher'd by Sylla.

The old Consular Denarius, as I said before, falls something short of our Standard, but yet comes so near it, that when it is of its full Weight, 62 Grains Troy, it will be about 8 d. of our Coin.

As to the Nummi Serrati, their Value was so well known, that even the Germans were not ignorant of it: Germani pecuniam probant veterem & diu notam, Serratos, Bigatosque. Vide

* Vide Rink, p. 5, 6.
Observations on Dr. Arbuthnot's

Vide Tacit. Lips. p. 437. Those Nummi Serrati were pretty common till the Time of Augustus; but * Joubert says he never saw any after that.

2 ηυ, My Computation has nothing to do with any of the Denarii but the Consular ones in perfection; for they began to degenerate, either in Weight, Fineness, or both, even before the total Ruin of the Commonwealth. Afterwards they sunk in Value from our 8 d. to 7 d. and 6 d. and I know not what.

3 ηυ, I took notice before that Bishop Hooper sets the Denarius at 64 Grains Troy. I don't suppose that either he or any body else, ever saw or heard of a Roman Denarius of that Weight: However, as there are many Passages in antient Authors, which imply that the Roman Denarius was the same with the Attick Drachma, which is known to be 67 Grains, I imagine the Bishop had a mind to trim the Matter, and make the Denarius 64 Grains Troy, instead of 62, that he might bring it nearer the Drachma. He might, for ought I know, have a better Reason; for if he had not, this is a very insufficient one: And when his Hand was in, he might as well have halved 5 Grains, the Difference between the Denarius and Drachma, and so have brought the Denarius to 64½ Grains, instead of 64.

As an Addition to what has been said upon this Subject, I shall out of Curiosity examine what a Denarius of pure Silver weighing 62 Grains Troy would be worth in our Money; which may thus be found out.

Our Pound Troy of 240 Pennyweight, is coin'd into 62 Shillings, or 744 Pence. If from 240 we take 18 for the Alloy, there will remain 222 = 5328 Grains Troy of pure Silver, which are contained in 744 Pence. Then as

* Vide Knowledge of Medals, p. 131.
5328 : 744 : : 62 : 8.65, which 8.65 is a small matter above 8.2. 

Since the specific Gravity has been so often mentioned in these Papers relating to the Denarius, it may be worth while to take Notice of Dr. Barrow's Method of finding the Quantity of two known Metals in any Mixture without dissolving the Mass. As for Instance: The Quantity of Silver and Gold in King Hiero's Crown. His Method to do this was by finding the Spaces taken up by Masses of Gold, Silver, and the Mixture of equal Weight. There is a great deal of Trouble in finding out these Spaces in the Method of * Archimedes, and indeed it is neither certain nor practicable in small Masses; but they are easily found out by the Knowledge of their specific Gravities.

Suppose, for instance, a Mass of Gold of the specific Gravity 20,000, an equal Mass of Silver 10,000; if these two be added together, and divided by 2, they would give the specific Gravity of the Mixture 15,000. These three equal Masses then of Gold, Mixture, and Silver, are in Weight to one another as 20 : 15 : 10. In order to find out the Spaces taken up by Masses of Gold, Mixture, and Silver of equal Weights, we must proceed by the reciprocal Proportion of their specific Gravities. The Gold was, for Instance, to an equal Mass of Silver by the Supposition as two to one; therefore the Space taken up by a Mass of Silver equal in Weight to the Gold, as 2 to 1. And the like will happen in all Cases whatever, the Proportion being observed. For the rest vide Barrow on Archimedes, p. 284.

I was willing, before I put an End to this long Chapter, to get a little Information of the Roman æs; but not having any more antient Coin of Brass than an Augustus, I put that

* Vide Vitruv. lib. ix. cap. 3.
Observations on Dr. Arbuthnot's

to the Trial: It is of the Æs rubrum, or what we call Copper, and of a good Colour.

\[
\begin{array}{ccc}
  & \text{Pw. gr.} & \text{gr.} \\
  \text{Its Weight in Air was} & 4.18 \frac{3}{4} & = 114.75 \\
  \text{Water} & - & 102.25 \\
  \text{Difference} & - & 12.50 \\
\end{array}
\]

Specific Gravity 9.18,

which exceeds the specific Gravity of our finest coin'd Copper by 0.18; but if we consider the Compression made Use of in the Roman Coinage, which must have been far greater than in ours, this Excess of specific Gravity may be owing to that Cause, and so the finest Æs rubrum of the Romans may well enough be set at the same Standard with our own.

I afterwards tried an Agrippa of a worse-looking Copper, and not altogether free from Dirt and Rust. This weighed

\[
\begin{array}{ccc}
  \text{In Air} & - & 171.377, \&c. \\
  \text{Water} & - & 150.625 \\
  \text{Difference} & - & 20.752 \\
\end{array}
\]

Specific Gravity 8.25;

which shews its Metal to be much baser than the former, and even than that of our Coin in King Charles the Second's Reign. Most of the Imperial Coins that I have, came nearer the Colour of Agrippa than Augustus.

I shall add two more Experiments relating to the Compression by Coinage, and the Increase of specific Gravity thereupon ensuing.

I took
Dissertations on Coins, Weights, &c.

I took a S.S. Shilling of King George the First, which weigh'd

\[
\begin{array}{c|c}
\text{In Air} & 91.6 \\
\text{Water} & 83.0 \\
\hline
\text{Difference} & 8.6 \\
\end{array}
\]

Its specific Gravity \(10.6511\).

This exceeds the specific Gravity of our Standard uncoind Silver, which is only \(10.535\); but falls short of that of King William's Half-crown, mention'd before, which amounts to \(10.75\). If there be no Mistake in Doctor Harris's Numbers or mine, the Half-Crown, by being letter'd upon the Edges, is more compressed and condensed in Proportion, than the Shilling.

I had some Suspicion that the Difference was, in some measure owing to the poor Relievo of King George's Silver Money, &c. therefore I took a Shilling of King Charles the Second with a bolder Relievo, and well preserved.

\[
\begin{array}{c|c|c}
\text{This weigh'd in Air} & 3.20 & 92.000 \\
\text{Water} & 3.11 & 83.375 \\
\hline
\text{Difference} & & 8.625 \\
\end{array}
\]

The specific Gravity \(10.666, &c.\).

This exceeds the specific Gravity of the former; but does not come up to that of King William's Half-Crown.

C H A P.
CHAP. IV.

Of the Roman Measures of Capacity for Liquids.

These are easily had when the Congius is known. The Doctor has given us in his Book three Congii.

1. That of Villalpandus of 207.4737 solid Inches. Vide Arbuthnot, p. 81. How far this may be depended upon may be seen before.

2. His own Congius, which is deduced from the Pound, &c. according to his Estimate. This Congius gives 207.0676 solid Inches, and is what the Doctor makes Use of in his Tables. Vide Arbuthnot, p. 82. It differs from the Congius of Villalpandus by only 0.4061. This Congius in the Doctor's Tables is set 7 — 4.942. The Objections against his Pound hold equally against his Congius, for if his Pound be too large, his Congius must be so too.

3. The Doctor gives us a Congius deduced from the Roman Foot, which Congius consists of 195.3139 solid Inches, and falls short of Villalpandus's by 12.1598 solid Inches. Vide Arbuthnot, p. 81.

4. A fourth Congius may be had from Paetus's Roman Ounce of 416.610 Grains Troy, which will bring out the Congius 197.3415 solid Inches. This exceeds the third Congius by only 2.0276 solid Inches.

5. This is taken from Savotus's Roman Ounce 411.875 Grains Troy. This Congius consists of 195.0986, &c. solid Inches, and differs very little from the third, since it falls short of it by no more than 0.2153 solid Inches.

6. A
Dissertations on Coins, Weights, &c.

6. A sixth may be had by the Ounce of 434 Grains Troy, which is deduced from the Denarius, as I have stated it at 62 Grains Troy. This Congius is in Weight, I mean contains Water of the Weight of 52080 Grains Troy, which may be thus made out. A Sextarius contains 20 Roman Ounces of Water, and a Congius 6 Sextarii. If therefore my Ounce of 434 gr. be multiplied into 20x6 it will give 52080 Grains Troy for the Congius. These Grains being reduced into Inches, after Dr. Arbuthnot’s Method, p. 81, will make this sixth Congius of 205.5789 solid Inches. He makes 760 gr. equal to 3 solid Inches. Then

\[
\frac{\text{Gr.}}{\text{f. I.}} : \frac{\text{Gr.}}{\text{f. I. Dec.}} = \frac{\text{As 760 : 3 : : 52080 : 205.5789.}}{}
\]

Some Persons may perhaps think the Denarius set too high at 62 Grains Troy, and chuse to set it at 61. By this Estimate we should have a

7. Of 51240 Grains Troy, which would consist of 202.2631 solid Inches, and would differ from the Congius at a Medium describ’d in the next Chapter of dry Measures by no more than 0.977 Parts of a solid Inch.

The Congii stand thus:

\[
\begin{array}{cccc}
\text{Villalpandus’s,} & \text{Arbuthnot’s,} & \text{My First,} & \text{My Second,} \\
\text{207.4737} & \text{207.0676} & \text{205.5789} & \text{202.2631} \\
\text{Patus’s,} & \text{Arbuthnot’s from the Roman Foot,} & \text{Savotus’s,} \\
\text{197.3415} & \text{195.3139} & \text{195.0986} \\
\end{array}
\]

Before we can adjust the Congius to the English Liquid Measures, we must know how many solid Inches are in our Wine Gallon, Pint, &c.
Observations on Dr. Arbuthnot's

It is commonly supposed, that there are in the Wine Gallon 231 solid Inches. Upon this Supposition, which is a false one, and yet made Use of by Dr. Arbuthnot and others, the eighth Part of a Gallon, or Pint, will be \( \frac{231}{8} = 28 \frac{3}{4} = 28.875 \) solid Inches. The Congius will be found by this Proportion:

\[
\begin{array}{c|c|c|c|c|c|c|c}
\text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} \\
\hline
\end{array}
\]

As 28.875 : 1 : : 205.5789 to a fourth Number, which will give the Pints, &c. in the Congius. This fourth Number is \( 7 + 3.4539 \).

Since Dr. Arbuthnot's Congius contains \( 7 + 4.9426 \), the Excess of his Congius above mine will be \( 0 + 1.4887 \).

So much for the Estimate of the Wine Gallon made Use of by the Gaugers, and by which the Excise is paid; but they who are concern'd, know well enough that it is wrong: For by an Experiment tried before several of our most eminent Philosophers in public Posts, as Flamstead, Halley, &c. at which Mr. Ward was present, the Wine Gallon amounted to no more than 224 solid Inches; at which Rate the Pint will be exactly 28 solid Inches. The Proportion will now stand thus:

\[
\begin{array}{c|c|c|c|c|c|c|c}
\text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} & \text{f. In.} & \text{Pt.} \\
\hline
\end{array}
\]


The Difference now between us is more considerable; for my Congius will exceed his by \( 4.6363 \) solid Inches.

\[
\text{My Congius being} \quad 7 + 9.5789 \\
\text{His} \quad 7 + 4.9426 \\
\text{Excess above his} \quad 0 + 4.6363
\]
Dissertations on Coins, Weights, &c.

The Congius according to my Estimate is $7 + 9.5789$.

The Sextarius, or 6th Part of it, $- - 1 + 6.2631$

The Hemina, \( \frac{1}{3} \) of Sextarius, $- - \frac{1}{2} + 3.1315$

The Quartarius, \( \frac{1}{4} \) of Sextarius, $- - \frac{1}{4} + 1.5657$

The Acetabulum, \( \frac{1}{8} \) of a Sextarius, $- \frac{1}{8} + 0.7828$

The Cyathus, \( \frac{1}{12} \) of Sextarius, $- - \frac{1}{12} + 0.5219$

The Ligula, \( \frac{1}{48} \) of Sextarius, $- - \frac{1}{48} + 0.1304$

These being found out by dividing the Congius, the rest of the Measures may be found out by multiplying it.


The Urna is 4 Congius's, $- - 3 + 5 + 10.3156$

The Amphora is 8 Congius's $- 7 + 2 + 20.6312$

The Culeus is 20 Amphora's $- 146 + 6 + 20.624$


| Ligula,   | - - | 000 | \( \frac{1}{48} \) | 00.1304 |
| Cyathus,  | - - | 000 | \( \frac{1}{12} \) | 00.5219 |
| Acetabulum, | - - | 000 | \( \frac{1}{8} \) | 00.7828 |
| Quartarius, | - - | 000 | \( \frac{1}{4} \) | 01.5657 |
| Hemina,   | - - | 000 | \( \frac{1}{2} \) | 03.1315 |
| Sextarius, | - - | 000 | 1 | 06.2631 |
| Congius,  | - - | 007 | 7 | 09.5789 |
| Urna,     | - - | 003 | 5 | 10.3156 |
| Amphora,  | - - | 007 | 2 | 20.6312 |
| Culeus,   | - - | 146 | 6 | 20.624 |

Dr. Arbuthnot's Culeus, in his first Tables, corrected by the Pen, contains \{ 143 + 3 + 11.328 and consequently falls short of mine \} $3 + 3 + 9.296$
In his Tables printed with his Book, the Culeus is \[ 143 + 3 + 11.095 \] which falls short of mine \[ 3 + 3 + 9.529 \]

Before I quit this Subject of the Liquid Measures, I cannot help taking Notice of a Fault in Dr. Arbuthnot, P. 124, in relation to the Cyathus.

Upon a Supposition that Budæus's Emendation of a Passage in Pliny is right, he says, That the Cyathus of Opimian Wine came to two Nummi. It is strange, that he should substitute the Cyathus instead of the Uncia; for the Uncia alone is mentioned by Pliny, and there is not a Word in this Place relating to the Cyathus.

He could not have so far forgot himself, as not to know that the Cyathus and Uncia were two quite different Things; for the Cyathus was \( \frac{1}{11} \) Part of the Sextarius; but as the Sextarius contain'd 20 Ounces of Water or Wine, a single Ounce was only a \( \frac{1}{10} \) Part of it. Therefore the Cyathus was to the Ounce as 20 to 12, or exactly as \( 1.666 \), &c. to 1, and consequently the Cyathus, exceeded the Ounce by above one Half. This being the Case, he must certainly have substituted the Cyathus instead of the Uncia, in order to make his Computation of Interest agree with what he imagined to be Pliny's. The Place in Pliny is certainly a very difficult one, and was Hardouin's Explanation of it right, the Ounce of Opimian Wine was sold for 960 Sesterii, or 8 Pounds of our Money, according to my Value of a Sesterius; a Price altogether monstrous and incredible. Vide Plin. Edit. Hard. Tom. i. p. 714.

By Budæus's Emendation of binis instead of vini, the Ounce was sold for no more than 2 Sesterii; a wide Difference this in their Accounts! but I think neither of them right, nor indeed capable of being reconcil'd to Pliny.

I shall
I shall therefore venture at another Emendation, and instead of *vini*, read *nummo*: This Emendation is not so forced as it may seem at first sight; for I don’t imagine that *nummo* was written at Length in that Place, but only its Character $N$. Vid. *Sertorius Ursatus*, which afterwards might easily become $NI$ by the Carelessness or Ignorance of the old Librarians. $NI$ not being understood by the following ones, and the Subject being *vinum*, they changed $NI$ into $VINI$. If this be admitted, the Ounce of Wine was sold for a *Nummus* or *Sestertius* and all will be easy; which may thus be made out:

The *Amphora*, which contain’d 960 Ounces, was sold at first for 100 *Nummi*; at this Rate the Ounce was worth little more than 0.1 of a *Sesterce*. But a hundred and sixty Years afterwards, the Interest of a 100 *Nummi* at 6 per Cent. would amount to $160 \times 6 = 960$ *Nummi*, which being added to the principal 100, would make 1060 *Nummi* in all. If this Sum be divided by 960, the Number of Ounces in an *Amphora*, it will give 1.1 *Sestertius* for the Value of an Ounce; and as the Fraction is but a small one, and probably was neglected in Trade, an Ounce of this *Opimian* Wine was sold for a *Nummus* or *Sestertius*. Indeed *Pliny* seems to have neglected the Principal of 100 *Sestertii* in his Account, and to have regarded only the Interest 960 *Sestertii*, at which Rate the Price of an Ounce of this Wine would be precisely one *Nummus* or *Sestertius*.

I think this is rating the Price high enough; for if the *Sestertius* be set at 2*d.*, which I take to be the true Value of it, the *Sextarius*, which contain’d 20 Ounces, and exceeded our Pint only by a small Fraction, would have cost 3*s.* and 4*d.* of our Money; and two *Sextarii*, nearly our Quart, 6*s.* and 8*d.* This I think was a fair Price for Wine at that time of day, when Wine was so excessively cheap as to
Observations on Dr. Arbuthnot's
to be sold sometimes at 2d. a Gallon, or less *. Vide Arbuthnot, p. 125, 126.

All that Dr. Arbuthnot says about the Cyathus is foreign to the Purpose, as also what he has about the Anatocismus; for Pliny says nothing about the Anatocismus, and but barely mentions the Usura modica & civilis, which was multiplicata semissibus, or 6 per Cent.

As to the Anatocismus, it seems to have been reckon’d oppressive, and yet some Usurers seem not content with it, tho’ they had 12 per Cent. besides, for their Money: Nihil impudentius Scaptio, qui centesimis cum anatocismo contentus non est. Vide Cicer. ad Attic. lib. v. Ep. 21. Arbuthnot, p. 210.

If the former Emendation appears too harsh, I know no other Method of setting Matters right, but by supposing that if the old reading singulas uncias VINI constisit, be right; HS has been dropp'd by the Librarians, after vini; but if Budeus’s Conjecture hold good, who reads B1NIS instead of VINI, the S in HS must have been dropp’d, and the Legs of the H, or II, made binis; or what is still more probable, out of IIS was made Binis.

Faults of this Kind are so very common in ancient Authors, that it is to be lamented that they did not write all their Sums, Dates, &c. in Words at length, instead of any numerical Characters whatever: An Error in a little Character often confounds a great Sum, and the common Writers

* What is said here is upon a Supposition that the Romans took Wine and Water to be of the same, or nearly the same specific Gravity. Vide Arbuthnot, p. 91, 92. Lowthorp’s Abridgment of the Philosophical Transactions, I. p. 610. But above all, Fannius in Ward’s Dissertation de Affe. Monum. Kempius. p. 49.
Dissertations on Coins, Weights, &c.

seem to have been of the same Temper with our common Printers. There was so much Money to be paid for so much Work; if they could get their Money, they were not at all solicitous whether their Work was executed well or ill.

Since I wrote what went before about the Cyathus, I have met with another Mistake relating to the Cadus, so that I am afraid the Doctor was not over exact in his Quotations and Translations: His Words are, Page 93, "that Julius Caesar at his triumphal Supper, according to Pliny, lib. 14. cap. 15. gave 100 Cadi of Chios Wine, that is, 4 Tuns, "25½ Gallons." I am at a Loss how to reconcile this with the Words of Pliny, which are these, Caesar Dictator triumphi sui caenâ vini Falerni amphoras, Chii cados in convivio distribuit. Here is another of 100 Cadi, which, were we to set the Cadus at the highest, would have been but a Trifle at a triumphal Entertainment, especially at one of Caesar's.

The Cadus, according to Hardouin, is by some Authors set at 10 Congii, by others at 12. Vide Plin. Tom. i. p. 722. Dr. Arbuthnot says, Page 93. that the Cadus was the same with the Metretes, which by his Tables contains

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<td>10</td>
<td>2</td>
<td>19.626</td>
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Pag. 83. He seems to make the Cadus the same with the Amphora, which he sets at

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<td>7</td>
<td>1</td>
<td>10.66</td>
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Pliny's Meaning plainly is, that Caesar gave to each Set of Company an Amphora of Falernum and a Cadus of Chian Wine. The single Sets did not consist of many Persons, but then they were vastly numerous; so that there must have been an Expence of Wine far beyond what our Author mentions. If he had reflected upon what he says, tho' not very exactly, at Page 131, that Caesar borrow'd of Hirrius
Observations on Dr. Arbuthnot's

_Hirrius 6000 Lampreys for one of his triumphal Suppers,_
besides what he probably bought and had of his own, or from Friends, and had consider'd that there must have been other Eatables, and Wine in Proportion, he would have found that there were so many thousand Guests at one of these Entertainments, that 100 Cadi of Chios Wine would hardly have been a Taste for each.
C H A P. V.

Of Roman Measures of Capacity for Things dry.

These may be adjusted to English Pecks, Gallons, &c. by comparing the solid Inches in the Modius with those in the English Peck, between which there is but little Difference. The solid Inches in the Modius are found by those in the Congius; which, according to my Computation, are 205.5789. For 8 Congii = 1644.6312 solid Inches make an Amphora, which contains 3 Modii, consequently, if 1644.6312 be divided by 3, we shall have for the Modius 548.2104.

We have two different Estimates of the solid Inches and Decimals in the English Peck.

The first is 544.5; this is the common Reckoning. If this supposed Peck be taken from my Modius, it would leave a Difference of 3.7104, and consequently the Modius would be 1 — 3.7104.

The second Estimate of the English Peck, which is the true one, according to Ward’s Young Mathematician Guide, p. 36, is 537.6. This would bring out the Modius that I shall stick to, 1 — 10.6104.

The Congius which the Doctor makes Use of in order to find his Modius, is 207.0676; which being multiplied by 8, gives the Amphora 1656.5408. This being divided by 3, gives the Modius 552.1802.
Observations on Dr. Arbuthnot's

If from this be taken the first or common English Peck, 544.5, it will leave a Difference of 7.6802, or throwing off the two last Decimals 7.68, and consequently his Modius will be \( \text{Peck} = 1 \quad \text{Gall.} = 7.68 \), as he has rated it in his Tables.

The Doctor's Modius then is  

\[
\begin{array}{c|c|c}
\text{Peck} & \text{Gall.} & \text{f. I. Dec.} \\
\hline
1 & 0 & 7.68 \\
\end{array}
\]

Mine \( - \quad - \quad 1 \quad - \quad 0 \quad - \quad 10.6104 \)

\[
\frac{10.6104 - 7.68}{10.6104} = 0.29304
\]

which is all the excess of mine above his.

These solid inches are too inconsiderable to be minded in small matters; but as they amount to 183,45th Part of my Peck, it is evident that in 183.45 Modii, my measure would exceed his by about a Peck.

The Modius, with its divisions, will, according to my estimate stand thus, neglecting the decimals of the 5th place and beyond it:

\begin{array}{|c|c|c|c|}
\hline
\text{Peek} & \text{Gall.} & \text{Pint} & \text{f. I. Dec.} \\
\hline
\text{The Modius,} & - & 1 & 0 & 00 & 10.6104 \\
\text{Semimodius}, & - & 0 & 1 & 00 & 5.3052 \\
\text{Sextarius,} & - & 0 & 0 & 1 & 0.6631 \\
\text{Hemina,} & - & 0 & 0 & \frac{1}{2} & 0.3315 \\
\text{Acetabulum,} & - & 0 & 0 & \frac{1}{4} & 0.0828 \\
\text{Cyathus,} & - & 0 & 0 & \frac{1}{12} & 0.0552 \\
\text{Ligula,} & - & 0 & 0 & \frac{1}{12} & 0.0138 \\
\hline
\end{array}

It is perhaps worth observing, that if we were to compute the Modius between the two extremes of Villalpandus and Savotus, we should have a new Modius, which would differ from
Dissertations on Coins, Weights, &c. 43
from the true English Peck by less than a solid Inch; which will thus appear:

\[
\begin{array}{ccc}
\text{f.In.} & \text{Dec.} \\
\text{Congius of Savotus is} & - & - & 195.0986 \\
\text{Hence his Amphora} & - & - & 1560.7888 \\
\text{His Modius} & - & - & 520.2629 \\
\text{Congius of Villalpandus is} & - & - & 207.4737 \\
\end{array}
\]

If these two Congii be added together, and divided by 2, we shall have a Congius between the two Extremes 201.2861:

Whose Modius found as before, will be - - 536.7629

The English Peck is - - - 537.6000

and therefore exceeds this Modius only - - 0.8371

According to this Supposition, the Roman Modius and English Peck might well be reckon'd the same.

A Congius computed from the Denarius at 61 Grains Troy, would be 202.2631, and would differ from the Congius at a Medium, by no more than 0.977, which is less than a solid Inch.

\[
\begin{array}{ccc}
\text{f.In.} & \text{Dec.} \\
The corresponding Modius is & - & - & 539.3682 \\
The English Peck & - & - & - & 537.6000 \\
The Difference & - & - & - & 1.7682 \\
\end{array}
\]

Some may possibly like these Proportions; but I chuse rather to keep to my former ones, for Reasons given in their proper Places.

FINIS
ERRATA.

Page 3, line 10, for Preparation read Proportion. p. 12, l. 12, for into the Decimals read into Decimals. p. 14, last line, for 7 gr. $\frac{2}{2}$, or 7 gr. 74 read 7 gr. $\frac{4}{4}$, or 7 gr. 0.74. p. 15, l. 2, for 0.26 read 0.26. p. 17, l. 2, for monnys read monnoys. ibid. l. 13, for and above read and is above. p. 25, l. 7, for yet is read yet it. p. 29, l. 25, after Gold, add must be to the Space taken up by the Gold. p. 39, l. 15, for another read nothing.

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