Arrangement.

THE LARGER ISLANDS, OR GREATER ANTILLES, ARE

Jamaica	*English.*	Porto Rico	*Spanish.*
Cuba	*Spanish.*	St. Domingo	*French and Spanish.*

THE SMALLER ISLANDS, or LESSER ANTILLES, also called THE CARIBBEE ISLANDS, are divided into LEEWARD and WINDWARD ISLANDS.

THE LEEWARD ISLANDS ARE

Tortola	*English.*	Guadaloupe	*French.*
The Saints	*English.*	Marigalante	*French.*
Barbuda	*English.*	St. Eustatia	*Dutch.*
Antigua	*English.*	St. Martin	*Dutch.*
St. Kitts	*English.*	St. Thomas	*Danish.*
Nevis	*English.*	Santa Cruz	*Danish.*
Montserrat	*English.*	St. John	*Danish.*
Dominica	*English.*	St. Bartholomew	*Swedish.*

THE WINDWARD ISLANDS ARE

Barbadoes	*English.*	Tobago	*English.*
St. Vincent	*English.*	Martinico	*French.*
Grenada	*English.*	St. Lucia	*French.*

ISLANDS ON THE COAST OF TERRA FIRMA.

Trinidad	*Spanish.*	Curaçao	*Dutch.*
Margarita	*Spanish.*	Bonaire	*Dutch.*

SETTLEMENTS ON THE CONTINENT OF SOUTH AMERICA.

Demerara	*Dutch.*	Essequibo	*Dutch.*
Berbice	*Dutch.*	Surinam	*Dutch.*

The monies, coins, exchanges, weights, and measures of the West Indies are classed under the following heads, viz. *English*, *French*, *Danish*, *Dutch*, *Swedish*, and *Spanish* Islands, as arranged in the foregoing Table; and the article will conclude with an account of the *Bermudas* and *Bahama* Islands.

ENGLISH ISLANDS.

Monies of Account.

Accounts are kept in all the English Islands in Pounds, Shillings, and Pence currency. The Pound is divided into 20 Shillings, and the Shilling into 12 Pence.

West India Currency.

West India currency is an imaginary money, similar to that already described under the article *United States*. It varies in different Islands from 40 to 100 per cent. Thus, in some colonies £140 currency, and in others, £200 currency, must be reckoned for £100 sterling.

The West India currencies had their origin in various causes; such as, the scarcity of specie, the mutilation of coins, and the depreciation of colonial paper. The monies of account, therefore, and the nominal prices of the current coins, have been raised, so as in some measure to correspond with those various depreciations.—Thus, where the currency was settled at 140, the Spanish Dollar (the principal coin in the West Indies) was ordered to pass for 6s. 8d. currency, and other coins in proportion.

The following are the currencies and corresponding values of the Dollar in the different English Islands

	Currency.	Sterling.	Currency.
Jamaica	£140	for £100	Dollar 6s. 8d.
Barbadoes	135*	100	6 3
Windward Islands (except Barbadoes)	175	100	8 3
Leeward Islands	200	100	9 0

Here it should be observed that the above proportions between currency and sterling are seldom acted upon, except in the valuation of silver coins. Even Dollars are sometimes at a premium; and gold coins pass for about 10 per cent. above currency in some of the Islands, as will be shewn in the following pages. The course of exchange, likewise, is generally much higher than currency.

Coins, &c.

The following are the current coins, and their nominal values, in the principal English Islands.

---

* Doubtful—see the article *Barbadoes*, page 362.

JAMAICA.

As the currency of Jamaica is £140, its proportion to sterling is as 7 to 5. Hence, £1 sterling = 28s. currency; and £1 currency = 14s. 3$\frac{3}{7}$d. sterling.

Gold Coins. **The following are the Gold coins current here, with their weight and legal value in currency:**

		dwt.	gr. troy.	Value in Currency.
SPANISH	Doubloon	17	8	.....£5 0 0
	Two Pistole Piece .	8	16	..... 2 10 0
	Pistole	4	8	..... 1 5 0
	Half Pistole	2	4	..... 0 12 6
PORTUGUESE	Johanes (called Joe)	18	12	..... 5 10 0
	Half Joe	9	6	..... 2 15 0
	Quarter Joe	4	15	..... 1 7 6
	Moidore	6	22	..... 2 0 0
	Half Moidore	3	11	..... 1 0 0
ENGLISH	Guinea	5	8	..... 1 12 6
	Half Guinea.....	2	16	..... 0 16 3
	Sovereign	5	2	..... 1 12 0

Any of the above Gold coins being found light, must pass according to their actual weight; and the deduction is 3d. currency for every Grain of deficiency. Thus, a Doubloon weighing 17 dwt. 6 gr. is worth only £4 19s. 6d. currency.

Silver Coins. **The Silver coins of Jamaica are Dollars, with Halves, Quarters, Eighths, and Sixteenths; passing for 6s. 8d. 3s. 4d. 1s. 8d. 10d. and 5d. currency.**

Also, Bits or Bitts, which are Spanish Reals, and which pass for 7$\frac{1}{2}$d. currency. Thus, 10 Bits and 5d. currency make 1 Dollar; and 1 Bit is worth 5$\frac{5}{7}$d. sterling.

Pistereens, or Two Bit Pieces, which are Spanish Pesetas, pass for 1s. 3d. currency, or 10$\frac{5}{7}$d. sterling.

English Shillings and Sixpences occasionally pass here as Pistereens and Bits.

Currency compared. **From the foregoing values of the different coins, the following is the intrinsic par of the currency of Jamaica with respect to sterling:**

According to the English gold coins, £100 sterling = £154 15 0 currency. Currency compared to Sterling.
Spanish ditto ..... = 156 13 2
Portuguese ditto ..... = 155 0 0
Dollar ..... = 154 11 9

It should be observed, that the above calculation on the Spanish gold is made at £5 per Doubloon; but the current price is £5 6s. 8d., though generally printed in Almanacs, &c. as £5.

According to a law of the Assembly of Jamaica, the exchange with England was formerly fixed at 40 per cent.; but it has varied from this considerably. Bills have been sometimes at a premium of 20 per cent. above the legal exchange, and they are seldom under 10. Dollars occasionally bear a premium of 3 or 4 per cent. Exchange.

BARBADOES.

The currency of Barbadoes has been formerly reckoned at 133⅓, and sometimes at 140 for £100 sterling; but it never was settled by any legal authority, nor does either of these numbers appear to be correct. When these proportions were reckoned, the Spanish Doubloon was valued at £4 10s. Barbadoes currency; but of late Doubloons have been circulated at £5 currency, or 16 Dollars, with their divisions in proportion: and in consequence of this, a rise has taken place in the market from 135 to 150 currency for £100 sterling, and most of the other coins have left the Colony to purchase Doubloons. Currency.

The Silver coins current in Barbadoes are Dollars, with halves, quarters, eighths, and sixteenths; passing for 6s. 3d., 3s. 1½d., 1s. 6¾d., 9½d., and 4¾d. currency; also Bits, which are Spanish Reals, and which pass for 7½d. currency. Thus, 10 Bits make 1 Dollar, and 1 Bit is worth 5⅕d. sterling. Silver Coins.

Pistereens, or Two Bit-Pieces, which are Spanish Pesetas, pass for 1s. 3d. currency.

There are also French Bits, called *Crimbal*, or *Isle du Vent* Bits, which pass for 7½d. currency.

In all military payments throughout the West Indies, and in most other transactions with the British Government, the Dollar is reckoned at 4s. 8d. sterling, which is generally called the *Army Par*, to distinguish it from the commercial par, which is reckoned at 4s. 6d. sterling.

ENGLISH LEEWARD ISLANDS.

TORTOLA, THE SAINTS, BARBUDA, ANTIGUA, ST. KITT'S, NEVIS, MONTSERRAT, DOMINICA, &c.

Monies and Coins.

The Dollar here is reckoned at 9s., which rate is most generally called the ***Leeward currency.***

A small circular piece is mostly cut out of the centre of the Dollar, which is about $\frac{1}{12}$ of its value; but in order to prevent its exportation, it is allowed to pass for $\frac{1}{8}$, and is then stamped, by authority, with the initials of the Island.

The Dollar thus cut passes for 8s. 3d. currency. It is called the *Cut Dollar* to distinguish it from the entire piece, which is sometimes called the *Round Dollar.*

The piece taken from the Dollar is sometimes called the Bit, and sometimes the *Moco;* but the regular Bit is the Spanish Real. In some places the Moco is $\frac{1}{4}$ of the Dollar, and in others $\frac{1}{8}$.

Dollars are occasionally cut into Halves, Quarters, &c., and pass accordingly.

There are here small copper coins, called Stampes, Dogs, and Half Dogs.

The following Table shews the value and proportion of the principal coins circulating in these Islands:

			Leeward Currency.		
2 Half Dogs	make 1 Dog	=	£0	0	$1\frac{1}{2}$
$1\frac{1}{2}$ Dog	1 Stampe	=	0	0	$2\frac{1}{4}$
6 Dogs or 4 Stampes	1 Bit	=	0	0	9
$1\frac{1}{2}$ Bit	1 Moco	=	0	1	$1\frac{1}{2}$
11 Bits	1 Cut Dollar ..	=	0	8	3
12 Bits or 8 Mocos	1 Round Dollar	=	0	9	0
5 Round Dollars.....	1 Guinea	=	2	5	0
8 Cut Dollars	1 Joe	=	3	6	0
16 Round Dollars.....	1 Doubloon ...	=	7	4	0

The divisions of the above gold coins pass in proportion; and for any deficiency of weight, a deduction is made of a Round Dollar per Dwt.; that is, $4\frac{1}{2}$d. currency per English Grain.

The exchange with London is generally about 200 per cent.

ENGLISH WINDWARD ISLANDS.

TOBAGO, ST. VINCENT, GRENADA, &c.

Currencies, Monies, &c.

The currencies, monies, coins, and exchanges, of these Colonies are nearly the same as those of the Leeward Islands, as described in the last article. There are, however, certain local regulations and customs which should be stated.

The Dollars in St. Vincent are cut into halves and quarters, and pass accordingly, at the rate of 8s. 3d. per Dollar. Stampes and Dogs are not equally used in all the Islands: the former are chiefly current in Tobago, and the latter in St. Vincent and Grenada.

The Bit, which is cut out of the middle of the Dollar, is reckoned the eleventh part: it is mostly issued by the Government of the Islands, and marked accordingly, viz. St. V. for St. Vincent; T. for Tobago; and G. for Grenada.

Bits cut out of the Dollar and not stamped by Government, are, by an act of the Assembly of Grenada, to be taken at only 6d. currency, while the stamped Bit passes for 9d.

The price of gold here is the same as in the Leeward Islands; that is, 1 Round Dollar per Dwt., or $4\frac{1}{2}$d. currency per English Grain.

FRENCH ISLANDS.

MARTINICO, ST. LUCIA, GUADALOUPE, MARIGALANTE, ST. MARTIN, &c.

Currency, Monies, and Coins.

Accounts are kept by the French settlers here in Livres, Sols, and Deniers; and by the English (particularly in Exchanges) in Pounds, Shillings, and Pence currency; the Livre and Shilling being of one value.

This currency is the same as that of the English Leeward and Windward Islands: hence the Dollar passes for 9 Livres or Shillings, and other coins in proportion. The names, however, of the same coins are different: thus, the Dog is called here the *Noir;* the Stampe, the *Tempé;* the Bit, the *Escalin;* and the Dollar, the *Gourde.*

The following Table shews the value of the coins, both in Livres and Leeward currency:

Currency, Monies, and Coins.

	Liv.	Sols.	Deniers.	Leeward Currency.
The Noir, or Dog	0	2	6	£0 0 $1\frac{1}{2}$
The Tempé, or Stampe	0	3	9	0 0 $2\frac{1}{4}$
The Trois Tempés	0	11	3	0 0 $6\frac{3}{4}$
The Escalin, or Bit	0	15	0	0 0 9
The Trois petites Pieces	1	2	6	0 1 $1\frac{1}{2}$
The Piece de Trente Sols, or Pistereen	1	10	0	0 1 6
The Moco	2	5	0	0 2 9
The Gourde, or Dollar	9	0	0	0 9 0
The Ecu of 6 Livres	9	17	6	0 9 $10\frac{1}{2}$
The Louis d'Or	40	10	0	2 0 6
Guinea	45	0	0	2 5 0
Napoleon of 40 Francs	66	13	4	3 6 8
Doubloon	144	0	0	7 4 0

All the divisions of the above gold coins pass in proportion, if full weight.

Gold is weighed by the Gros, which is $\frac{1}{8}$th of the old French Ounce (Poids de Marc). The Gros is divided into 72 French Grains, which equal 59 Grains, English troy.

The Doubloon should weigh 7 Gros 3 Gr. or 17 Dwt. 8 Gr. English troy.

And the Napoleon, or Louis, 3 Gros 26 Gr. or 8 Dwt. 6 Gr. ditto.

The following gold coins are taken by actual weight, viz.

Portugal Pieces, at ..... 22 Livres per Gros.
Counterfeit ditto, coined in America, at ..... 20 ditto per Gros.
French and Spanish Coins, deficient in weight, at ..... £19 15s. per Gros.
English ditto, at 8 Livres 8 Sols per Dwt., that is, 7 Sols per English Grain.

Weights & Measures.

The weights and long measures (with few exceptions) are those of France according to the Old System, for which see *France*.

The Aune, cloth measure, is 44 French Inches, or 46,9 English Inches.

The Carré, land measure, contains 3 Arpents, 78 Perches, 28 square Feet, Paris measure; which answer to 3 English Acres 31 Perches nearly. The Carré is divided into 10,000 square Paces, each Pace being $3\frac{1}{2}$ French Feet, or 3 Feet 8,4 Inches English.

The English Gallon is a common measure for liquids; and it is divided into 2 Pots, 4 Pintes, 8 Chopines, 16 Roquilles, 32 Muces, or 64 Demimuces.

The New System of French Weights and Measures has been partially introduced in these Islands.

ST. DOMINGO, OR HAYTI.

In the French part of St. Domingo, or Hayti, accounts were formerly kept, as Monies, &c. above, in Livres, Sols, and Deniers current, and the Dollar was then reckoned at 8 Livres 5 Sous current; but at present, accounts are mostly kept in Dollars and Cents, as in the United States.

The monies in circulation are nearly the same as in the Leeward Islands. Dollars are valued at 4s. 6d. sterling, with halves and quarters in proportion. 11 Escalins pass for 1 Dollar, and 1 Escalin is reckoned at 9 Cents.

Doubloons pass for 16 Dollars; Joes for 8 ditto; French Crowns for 1 Dollar 9 Cents, and the Half Crowns in proportion. French pieces of 5 Francs pass for 9 Escalins, or 81 Cents.

DUTCH COLONIES.

ST. EUSTATIA, ST. MARTIN, CURAÇOA.

Accounts are kept in these Islands in Pieces of Eight; that is, Piastres current Monies, &c. of 8 Reals or Schillings, each Real being subdivided into 6 Stivers.

The Piastre Gourde or Spanish Dollar passes for 11 Reals or Bits; and thus the current Piastre is worth 3s. 5d. sterling, reckoning the Dollar at 4s. 8d. sterling.

The Joe passes here for 11 Piastres current; the Spanish single Pistole for $4\frac{1}{2}$ Piastres, more or less; the other Spanish and Portuguese gold coins in proportion.

The weights and measures of St. Eustatia and St. Martin are the same as those of Holland, for which see *Amsterdam;* but at Curaçoa they are different, 93lb. of this Island being equal to 100lb. of Amsterdam: hence, 100lb. of Curaçoa = 117lb. avoirdupois.

At Curaçoa the Spanish Vara is used, which answers to $33\frac{3}{8}$ English Inches; and 81 such Varas are equal to 100 Ells of Amsterdam.

SURINAM, BERBICE, DEMERARA, ESSEQUEBO.

Accounts are kept in these Settlements in Guilders of 20 Stivers; the Stiver Monies, &c. being divided by some into 8 Duits, and by others into 12 Pennings.

All the coins of Holland circulate here, and are mostly reckoned at 20 per cent. above their value in Dutch currency.

Monies, &c. The following is their general rate, as well as that of other monies:

	Guilders.	Stivers.		Guilders.	Stivers.
10 Dubbelties .. =	1	0	Spanish Dollar .. =	3	0
The Bit ..... =	0	5	Ducatoon ..... =	3	3
Sestehalf ..... =	0	5½	Gold Ducat..... =	6	6
Schilling ..... =	0	6	Guinea ..... =	14	10
Guilder ..... =	1	4	Ryder ..... =	16	16
Dalder ..... =	1	10	Joe ..... =	22	0
Rixdollar ..... =	3	0	Doubloon ..... =	42 to 44	

The chief circulating medium here is paper, issued by Government.

In 1809 a new silver coinage was minted at the Tower of London for these Colonies, consisting of pieces of 3, 2, 1, ½, and ¼ Guilders. The larger piece weighs 15 dwt., and is 1 oz. 6 dwt. worse than English standard: its value, therefore, is 3s. 5d. sterling; or, computing it as the Dollar is mostly rated in the West Indies (i. e. at 4s. 8d.), its value is 3s. 8¼d., and the smaller pieces in proportion. They are marked on the reverse, *Colonies of Essequebo and Demerara Token*, and the King's head is on the obverse.

The exchange with London should be about 12 Guilders for £1 sterling; but it varies considerably above this, even to 20 Guilders and upwards.

The weights and measures of Amsterdam are used in all these Settlements.

DANISH ISLANDS.

ST. THOMAS, ST. JOHN, SANTA CRUZ.

Monies, &c. Accounts are kept here in Piastres or Rixdollars current (also called Pieces of Eight); each Rixdollar being divided into 8 Schillings or Bits, and each Bit into 6 Stivers.

Accounts are also kept in Dollars of 100 Cents, as in America.

The Rixdollar current is commonly reckoned 20 per cent. worse than Danish currency; but, according to the price of most of the Danish coins in these Islands, the difference is 25 per cent.: thus the Danish current Ducat of 2 Rixdollars Danish currency passes here for 2½ Rixdollars or 20 Bits; and the Danish Bank Notes of 5 Rixdollars pass in the same proportion for 6¼ Rixdollars.

The Silver coins struck for the Danish Islands are, quadruple, double, and single Bits, and pieces of 1 and 3 Stivers.

The Spanish Dollar passes here for 12½ Bits, and each Bit for 6¼ Stivers; also for 8¼ Shillings, Tortola currency. Monies, &c.

The Leeward currency is used in the Danish Islands in the purchase or negotiation of bills on England, though accounts are not so kept. Gold is valued at 1 Dollar per dwt., or 4⅛d. currency per English Grain.

The exchange between London and these Islands is, £100 sterling for £195 Tortola or Leeward currency: it is sometimes much higher.

The Spanish Dollar is given in exchange for the monies of other places.

The weights and measures are those of Denmark, which will be found under the article *Copenhagen;* but the English long measure is also used here.

SPANISH ISLANDS.

CUBA, PORTO RICO, TRINIDAD, and Part of ST. DOMINGO.

The monies, coins, weights, and measures, of the Spanish Islands are the same as in all Spanish America, which have been described under the article *Mexico.* Monies, &c.

Trinidad, however, having been many years in the possession of the English, has chiefly adopted the denominations of money of the English Islands.

Accounts are therefore kept here in Pounds, Shillings, and Pence, Leeward currency; and also in Dollars and Bits, the Bit being the 9th part of the Dollar.

There are likewise Silver pieces of Half Bits and Quarter Bits.

The Spanish, Portuguese, and English gold coins, pass as follow in Trinidad:

	Dwt.	Gr.	Dollars.	Bits.	Leeward Currency.
The Doubloon	17	8	15	8	£7 4 0
Half Ditto	8	16	7	8½	3 12 0
Joe	7	12	6	8	3 2 0
Guinea	5	8	4	8	2 4 0

Gold is valued at 8s. 3d. Leeward currency per dwt., or 4⅛d. per Grain.

ST. BARTHOLOMEW, a small Swedish Island, uses the monies and currency of the other Leeward Islands. Sundry Islands.

The BERMUDA ISLANDS use the Jamaica currency; and the Gold coins of England, France, Spain, Portugal, and the United States, whether cut or otherwise, pass by law for 2d. sterling per Grain.

The BAHAMA ISLANDS generally use the New York currency; but they reckon the Dollar here at 4s. 8d. sterling; and thus Bahama currency is reduced to sterling by multiplying by 7 and dividing by 12, and *vice versa.*

WEST INDIA EXCHANGES.

DAMAGES ON RETURNED BILLS.

Exchanges. When bills drawn in the West Indies on London are not duly honoured, they are returned to the drawer, with the following charges:

	Damages.	Interest per Annum.	Time how charged.
Jamaica	8 per cent.	6 per cent. ..	from date of the bill.
Barbadoes	10 per cent.	6 per cent. ..	from the time of presentation with protest.
Grenada	10 per cent.	6 per cent. ..	from the bill falling due.
St. Vincent	10 per cent.	8 per cent. ..	ditto.
Tobago	10 per cent.	8 per cent. ..	ditto.
Trinidad	10 per cent.	6 per cent. ..	from date of the protest.
Dominica	10 per cent.	6 per cent. ..	ditto.
Nevis	10 per cent.	8 per cent. ..	ditto.
Montserrat	10 per cent.	8 per cent. ..	ditto.
Antigua	10 per cent.	8 per cent. ..	ditto.
St. Kitt's.....	10 per cent.	8 per cent. ..	ditto.
Tortola	10 per cent.	8 per cent. ..	ditto.
Demerara .... Essequebo.... Berbice ..... Surinam	25 per cent.	6 per cent. ..	from date of presentation.
St. Thomas .. St. John .... Santa Cruz ..	10 per cent.	10 per cent. ..	from date of the protest.

There are occasionally other charges besides the above, such as postage, notarial expenses, and difference of exchange.

If a bill drawn in the West Indies on any part of Great Britain be noted for non-acceptance, the holder may oblige the drawer, by legal process, to give security in the Island for the amount, without waiting for the bill being protested for non-payment.

WIRTEMBERG *(in Germany)*.

Monies of Account.

In Wirtemberg and Stutgard, accounts are kept in Guldens or Florins, of 28 Shillings, or 168 Pfenings current.

This Gulden is reckoned at 15 Batzen, or 60 Creutzers. A Rixdollar current is worth $1\frac{1}{2}$ Gulden, $2\frac{1}{10}$ Pfunds, $22\frac{1}{2}$ Batzen, 30 Kaysergroschen, 42 Schillings, 90 Creutzers, or 252 Pfenings. 7 Shillings are equal to 15 Creutzers; and 5 Creutzers, to 14 Pfenings.

These monies are valued according to the 24 Florin rate, the Cologne Mark of fine silver being 16 Rixdollars. The Florin is therefore worth 21d. sterling.

Coins.

The Gold coins are, Ducats of 5 Florins, and Carolins d'or of 11 Florins: the Silver coins are, pieces of 24, 12, and 6 Creutzers. The Creutzer is a copper coin, worth about $\frac{1}{3}$ of a Penny.

Weights.

The weight for gold and silver is called the Cologne Mark, though it is something heavier; weighing 3610 English Grains, or 233,904 Grammes.

The commercial Pound is double the gold and silver weight. Thus 100lb. of Wirtemberg answer to 103,1lb. avoirdupois, or 46,78 Kilogrammes.

Measures of Capacity.

The Scheffel, corn measure, is divided into 8 Simris, 32 Vierlings or Unzen, 128 Achtels, or 256 Masslein; and renders 5,063 English Bushels, or 1,783 Hectolitre.

The Fuder of wine contains 6 Ohms, 96 Immis, 960 Maass, or 3840 Schoppen.

Long Measures.

The Wirtemberg Foot is 11,26 English Inches, or 0,286 of a Metre.

A short Ruthe is 12, and a long Ruthe, 15 Rhineland Feet: the former therefore measures 12,356 Feet, and the latter, 15 Feet $5\frac{1}{2}$ Inches, English measure.

The Stutgard Ell contains 24,08 English Inches, or 0,611 of a Metre.

Superficial Measures.

A great Morgen, or Acre of land, contains 400 short square Ruthes; and is equal to 1 Acre, 1 Rood, 24 Perches English, or 56,74 French Ares. A little Morgen contains 150 great square Ruthes; and measures 3 Roods 11 Perches nearly, or 33,24 French Ares. $1\frac{1}{2}$ Morgen, of the latter measure, is called a Juchart or day's work.

WISMAR *(in Germany)*.

Monies, &c. Accounts are kept here in Rixdollars of 48 Schillings, or in Marks of 16 Schillings; the Schilling being divided into 12 Pfenings current.

The Rixdollar is also reckoned at 2 Mecklenburgh Guldens, 3 Marks, 24 Groschen, or 192 Witten.

The coins of Mecklenburgh have been described under the article *Rostock*.

Weights. The same weights and measures are in use as at Hamburgh. There is also a town weight, used chiefly for weighing Russian and Swedish produce, which is reckoned 2 per cent. heavier than that of Hamburgh. It therefore contains 7625 English Grains; and 100lb. of Wismar = 108,93lb. avoirdupois, or 49,40 Kilogrammes.

The Shippond of groceries weighs 20 Lisponds, or 320lb.; the Shippond of iron or lead is 280lb.; a Stone of flax is 20lb.; a Stone of wool or feathers, 10lb.; a Lispond, 16lb.

Measures. The Last of corn is divided into 8 Dromts, or 96 Scheffels. The Scheffel for wheat, rye, pease, and barley, contains 1,15 English Bushel, or 0,4059 of a Hectolitre. The Scheffel for oats is larger; and renders 1,21 English Bushel, or 0,4285 of a Hectolitre. Thus the Last of wheat, &c. answers to 13,82 and the Last of oats to 14,59 English Quarters.*

The measures for wine are the same as at *Rostock*.

The Ell is 2 Feet, each of 11,45 English Inches, or 0,290 of a Metre.

ZANTE *(an Island in the Ionian Sea)*.

This article includes an account of the monies, weights, and measures of all the Ionian Islands, viz. *Corfu, Paxo, Zante, Cephalonia, Santa Maura, Ithaca,* and *Cerigo*.

Monies of Account. Accounts are kept in the Ionian Islands in Dollars of 100 Cents or Oboli. In Cerigo, however, and other places near the Continent, accounts are also kept

* The above statements are chiefly extracted from the despatches transmitted to London in 1818 by *P. Susscroth, Esq.* His Majesty's Vice Consul at Wismar.

in Turkish Piastres of 40 Paras each; and $6\frac{3}{4}$ Piastres equal the Spanish Dollar. Thus the Piastre may be valued at $7\frac{1}{3}$d. sterling. Monies of Account.

The principal Gold coin in these States is the Spanish Doubloon, with its subdivisions. It passes for 15 Spanish Dollars 20 Cents; and its full weight is $416\frac{1}{2}$ Grains troy, being the same weight as the Dollar. Coins.

The Silver coins are, Spanish Pillar Dollars, valued at 100 Cents, with halves and quarters in proportion; Imperial Dollars, with halves, weighing 431 English Grains, and passing for 98 Cents; Venetian Dollars, weighing 432 English Grains, passing for 96 Cents, with halves and quarters in proportion.

The Copper coins are, Cents or Oboli, with double and half pieces, called Dittoboli and Mioboli. The Cent weighs 146 English Grains. A coinage of Quarter Cents, or 400 per Dollar, is in a state of preparation. The Cent is equal to an English Halfpenny nearly.

The weights are Venetian and Turkish. The Pound, Peso Grosso, of 12 Ounces, is reckoned at 7384 troy Grains, or 478,424 Grammes. Hence $94\frac{1}{3}$lb. = 100lb. avoirdupois. The Peso Sottile, for precious metals and drugs, is one-third lighter, weighing 8 Ounces. Weights.

The Oke is used in the Islands to the Southward. It is computed at 18900 English Grains, or $2\frac{7}{10}$lb. avoirdupois. The Levant Cantar or Quintal contains 44 Okes, and therefore answers to 118,8lb. avoirdupois, or 53,88 Kilogrammes.

MEASURES OF THE IONIAN STATES.

The dry measure is the Moggio, which is divided into 8 Misure, and is reckoned at 5 English Bushels. The Misura of Corfu is, in form, the frustrum of a cone, and its dimensions are as follow: the diameter of the top, 11 Inches; of the base, $14\frac{1}{2}$ Inches; and the depth, 10 Inches. Its contents are therefore 1284,78 cubic Inches, answering to 4,78 Winchester Gallons, or 21 Litres. Corfu and Paxo.

Salt is sold by the Centinajo (100lb.), containing 30 Sacchi, each Sacco 2 Mozzette, and each Mozzetta about 70lb. Peso Grosso.

Lime is sold by the Moggio, which has been progressively reduced first to 1 Venetian cubic Foot, and latterly to about half that quantity.

The wine measure is the Barrel, which is divided into 4 Jars or 128 Quartucci; and contains 18 English Gallons, or 68,13 Litres.

The Barrel of oil is divided into 4 Jars, 96 Miltre, or 384 Quartucci.

Measures of Zante.

The corn measure is the Bacile, which should contain 72lb. Peso Grosso of best wheat; and estimating the Winchester Bushel at 60lb. avoirdupois, the Bacile equals $1\frac{1}{4}$ Bushel.

The wine Barrel of 120 Quartucci equals $17\frac{5}{8}$ English Gallons.

In oil measure the Barrel is divided into 9 Lire.

The Migliajo (1000lb.) for currants is 1 per cent. lighter than for other articles.

Cephalonia.

The Bacile of best wheat should weigh 80lb. Peso Grosso. Thus the Bacile yields $1\frac{4}{5}$ English Bushel.

Salt is sold by the Bacile of 64lb. Peso Grosso.

The wine Barrel is divided into 6 Secchj, 72 Boccali, or 144 Quartucci; and contains 18 English Gallons.

The oil Barrel is divided into 9 Pagliazze.

Santa Maura.

The dry measure is the Cado, 4 of which are equal to 3 Moggi of Corfu; and thus the Cado contains $3\frac{3}{4}$ English Bushels.

Salt is sold by the Cariolla of 99lb. Peso Grosso.

The Barrel contains 18 English Gallons. It is divided for wine into 6 Secchj, and for oil into 21 Succali.

Ithaca.

The measure for corn is the Bacile, 5 of which make 1 Moggio: consequently the Bacile equals 1 English Bushel.

The liquid measure is the Barrel; which is divided for wine into 64 Boccali, or 128 Quartucci, and for oil into 6 Secchj. The Barrel contains 18 English Gallons.

Cerigo.

The Chilo is equal to 1 English Bushel.

The wine Barrel is divided into 30 Bozie, or 60 Agastere; and contains 18 English Gallons.

The oil Barrel contains $14\frac{4}{5}$ English Gallons; and is divided into 24 Bozie.

Long Measures.

The Venetian Foot is used in all the Islands: it equals $13\frac{3}{4}$ English Inches.

The Passo is composed of 5 Venetian Feet.

The Braccio for cloths, &c. equals $27\frac{3}{16}$ English Inches.

The Braccio for silks equals $25\frac{3}{8}$ English Inches.

Land is measured by the Misura or Baccile, which is $\frac{1}{8}$ of a Moggio; 400 square Passi being 1 Misura or Baccile, about $\frac{3}{4}\frac{}{0}$ of an Acre English. Thus the Moggio = 2 Acres 1 Rood 24 Perches, or 97,12 French Ares. Land Measures.

Vineyards are measured by the Zappada; 3 Zappade (a computed day's work of digging) being 1 Misura.

Firewood is measured by the square Passo, usually, however, only 2 Feet thick; this depending on the quality of the wood. Stone is measured by the Passo Cubo.*

ZELL *(in Germany)*.

Accounts are kept here in Rixdollars of 36 Mariengroschen, as in *Hanover*, which see. Monies.

The Pound is divided into 32 Loths, or 128 Quentins; and contains 7511 English Grains. Thus 100lb. of Zell = 107,31b. avoirdupois, or 48,66 Kilogrammes. Weights.

The Lispond is 14lb.; the Centner, 112lb.; the Shippond, 20 Lisponds, or 280lb.; the Last, 12 Shipponds. A Stone of flax is 20lb.; a Stone of wool, 10lb.

A Last of corn contains $2\frac{1}{2}$ Wispels, 10 Scheffels, 100 Himtens, or 400 Spints; a Wispel is 4 Scheffels or 40 Himtens. The Wispel renders 35,30 English Bushels, or 12,43 Hectolitres. Measures of Capacity.

The Stubgen, liquid measure, is divided into 4 Quartiers, or 16 Nossels; and contains 1,025 English Gallon, or 3,888 Litres. A Fass of beer is 4 Tonnes or 104 Stubgens; a Tonne of honey, $25\frac{1}{2}$ Stubgens.

The Foot is 11,45 English Inches, or 0,290 of a Metre. The Ell measures 2 Feet; the Clafter or Fathom, 6 Feet; and the Ruthe, 8 Feet. Long Measures.

* For the foregoing account of the Monies, Weights, and Measures of the Ionian Islands, the Author is indebted to the *Earl of Lauderdale*; at whose request it was transmitted to London, in March, 1821. The statements were signed by *J. Woodhouse, Esq.* Auditor General.

ZURICH *(in Switzerland)*.

Monies of Account.

Accounts are kept here in Florins of 60 Creutzers, or 480 Hellers; or in Florins of 40 Shillings.

The Florin is also divided into 16 Batzen, or 240 Angsters.

A Rixdollar of account is worth $1\frac{1}{2}$ Florin, 60 Shillings, or 90 Creutzers; a Batze, $3\frac{3}{4}$ Creutzers, 10 Rappen, or 15 Angsters; a Creutzer, 4 Angsters, or 8 Hellers; a Rappe, $1\frac{1}{2}$ Angster, or 3 Hellers.

All public accounts relating to the general concerns of the Diet are kept in Swiss Livres of 10 Batzen. See *Switzerland, &c.*

There were formerly here two sorts of money; currency and money of exchange.

Sales of merchandize and all daily transactions took place in currency, in which money the old French Louis d'or (coined before 1786) was reckoned at 9 Florins 45 Creutzers, but it has been raised to 10 Florins; the French Ecu of 6 Livres was reckoned at 2 Florins $26\frac{1}{4}$ Creutzers, and it has been raised to $2\frac{1}{2}$ Florins.

In money of exchange, the value of the oldest French Louis d'or (coined before 1726) was fixed at 7 Florins; the Ducat was reckoned at 3 Florins 54 Creutzers, and the effective Rixdollar or Ecu, at 108 Creutzers.

273 Florins of exchange were commonly reckoned equal to 310 Florins current; but this proportion was not permanent. At present, however, money of exchange is nearly disused, and foreign exchanges, as well as all other commercial transactions, mostly take place in currency.

Coins.

The coins here are Ducats, which, when they weigh $\frac{1}{2}$ Pistole, are reckoned at 4 Florins 15 Creutzers, or 4 Florins 10 Shillings; but when they are of the common weight, at 4 Florins 18 Creutzers, or 4 Florins 12 Shillings; silver Ecus, at 2 Florins; single, half, and quarter Florins, at 60, 30, and 15 Creutzers; Batzen, at $3\frac{3}{4}$ Creutzers; Shillings, halves, and quarters, at 12, 6, and 3 Hellers; and pieces of 2 Heilers.

French Louis d'ors, as mentioned above, pass for 10 Florins, and French Crowns for $2\frac{1}{2}$ Florins.

The modern coins of France, however, have a more general circulation here.

68 Ducats are to weigh a Cologne Mark of gold, $23\frac{1}{2}$ Carats fine. The Ecus and half Ecus or Florins are to be $13\frac{1}{3}$ Loths (or $\frac{1}{12}\frac{0}{2}$) fine; and 11 Ecus are to contain a Cologne Mark of fine silver. The half Florins are 12 Loths (or $\frac{2}{12}$) fine; and 44 pieces contain a Cologne Mark of fine silver. 94 pieces of 15 Creutzers weigh a Cologne Mark, 8 Loths (or $\frac{6}{12}$) fine. Rate of Coinage.

Thus the Florin, Zurich currency, contains 164 English Grains of fine silver, or $177\frac{3}{10}$ Grains of standard silver, and it is therefore worth 23d. sterling nearly; or £1 sterling = 10 Florins 26 Creutzers.

Wrought gold is to be $19\frac{1}{2}$ Carats fine; and wrought silver, $13\frac{1}{2}$ Loths (or 10 Ounces $2\frac{1}{2}$ Dwt.) fine.

The Mark, gold and silver weight, is divided into 16 Loths, 64 Quintlins, 256 Pennings, or 4352 Zurich Asen; which are equivalent to 4876 Dutch Asen. Hence the Mark of Zurich contains 3616,9 English Grains, or 234,346 Grammes. Gold and Silver Weight.

The light Pound of 16 Ounces, with which silk is weighed, contains 2 of the above Marks: it weighs therefore 7233 English Grains; and 100lb. of Zurich silk weight = 103,3lb. avoirdupois, or 46,86 Kilogrammes. Commercial Weights.

The heavy Pound, with which most other sorts of merchandise are weighed, is 18 Ounces or 36 Loths; and weighs therefore 8138 English Grains. Thus 100lb. of Zurich heavy weight = 116,25lb. avoirdupois, or 52,72 Kilogrammes.

The measure for all sorts of corn is the Viertel; which contains 1323 Zurich cubic Inches, or 1262 English cubic Inches. The Mutt of corn is divided into 4 Viertels, 16 Vierlings, or 64 Masslings; and renders 2,34 English Bushels, or 0,827 of a Hectolitre. Dry fruits are measured by the Immi, the 9th part of a Viertel. Dry Measures.

Pulse is sold by the Malter of 16 Viertels. This Viertel contains 1338 cubic Inches of Zurich, or $1276\frac{1}{3}$ English cubic Inches; and renders 0,593 of an English Bushel, or 0,2091 of a Hectolitre.

Salt is measured by the Maass of 4 Viertels, each containing 1473 cubic Inches of Zurich, or 1406 English cubic Inches. This Viertel therefore equals 0,653 of an English Bushel, or 0,2303 of a Hectolitre.

Wines and other liquids are measured by the Kopf of 2 Maasses. The land Maass contains $116\frac{3}{4}$ cubic Inches of Zurich, or $111\frac{1}{3}$ English cubic Inches; and equals 0,48 of an English Gallon, or 1,82 Litre. The city Maass is $\frac{1}{10}$ less. Liquid Measures.

A Saum, gross measure, is $1\frac{1}{2}$ Eimer; and an Eimer contains 4 Viertels, 32

Liquid Measures.

Kopfs, 64 Maasses, 128 Quartlins, or 256 Stotzes. This Eimer therefore = 30,83 English Gallons, or 116,67 Litres.

A Saum, thin measure, is likewise $1\frac{1}{2}$ Eimer; and the Eimer contains 4 Viertels, 30 Kopfs, 60 Maasses, 120 Quartlins, or 240 Stotzes. This Eimer is therefore about 29 English Gallons, or 109,36 Litres.

The measure for oil and honey contains 88 cubic Inches of Zurich, or 84 English cubic Inches, nearly 3 English Pints, or 1,37 Litre. Oil is also sold by the Pound weight.

Long Measures.

The Foot is divided into 12 Inches, and equals 11,81 English Inches, or 0,30 of a Metre. The Ell is 2 Feet; and therefore 99 Ells = 65 English Yards.

The Ruthe or Rod is 10 Feet, each of which, in land surveying, is divided into 10 Inches.

The Clafter or Fathom (the standard measure of which is the space between the two iron hinges of the gate of the late Convent of Nuns in Zurich) measures 73,35 English Inches, or 1,863 Metre.

Exchanges.

Zurich exchanges with and gives (more or less) to—

Amsterdam	53 Creutzers	for 1 Florin.
Augsburg	108 Florins	for 100 Florins current.
Francfort	1 per Cent. loss.	
Geneva	2 per Cent. loss.	
Genoa	21 Creutzers	for 1 Lira fuori banco.
Hamburgh	240 Florins	for 100 Rixdollars banco.
Leghorn.....	128 Creutzers	for 1 Pezza of 8 Reals.
Leipsic	107 Florins	for 100 Florins in Louis d'ors.
London	11 Florins	for £1 Sterling.
Lyons and Paris,	$\frac{1}{2}$ per Cent. profit.	
Milan.....	107 Florins	for $333\frac{1}{2}$ Lire correnti.
Nuremberg	96 Florins	for 100 Florins in small coins.
Venice	$13\frac{1}{2}$ Creutzers	for 1 Lira piccola.

The usance on Holland and Germany is 14 days after sight. No days of grace are allowed in Zurich.

END OF VOL. I.

Printed by J. Whiting, 3, Lombard Street.

ADDENDA.

TURKISH METROLOGY.

After the foregoing articles had been printed, a delay occurred in the publication from an important cause—the arrival of a Set of Standard Weights from Constantinople, which had been long expected for the Work; and as they are found more accurately adjusted in their divisions and proportions than any other weights hitherto received from Turkey, their contents are here inserted as supplementary matter or Addenda.

It should be explained that when it became necessary, in the course of the Work, to print the article *Constantinople*, as no Standards had been then received from that place, those of Smyrna were adopted (for the weights of both cities should be equal). Some inaccuracies, however, in their divisions are alluded to (p. 73); and it is now found that the *Oke* of Smyrna is about 1 Grain in 700 heavier than that of Constantinople.

The following are the contents of the Constantinople Weights, as determined at the London Mint August 24, 1821:

The Oke of 400 Turkish Drams = 19800 English Grains troy = 2lb. 13 oz. 4 drams avoirdupois, or 1 Kilogramme 283 Grammes.

Hence the Chequee of 100 Drams = 4950 Grains or 320,75 Grammes, and all its subdivisions and multiples in proportion.

Thus also the Kintal or Cantaro of 45 Okes or 100 Rotoli = 127lb. avoirdupois, or 57½ Kilogrammes, very nearly.

N. B. It is recommended that the foregoing proportions be substituted in the articles *Constantinople* and *Smyrna*, in both Volumes, instead of the contents of the Oke, Chequee, Kintal, &c. already inserted.

This preference is given to the Standards of Constantinople, as being of superior workmanship and materials; and above all, as their subdivisions have been found adjusted with the greatest accuracy.

The correctness, however, of the Smyrna Standards was attested by the *Cadi* of the city on a sheet of parchment, in Turkish characters, and stamped with the *Crescent*.

The Standards of Constantinople are differently verified, that is, by stamps on the weights themselves. Their adjustment was completed by the official authority under

the immediate inspection of *M. Frédéric Pisani*, Dragoman to His Excellency *Lord Strangford*, the British Ambassador at that city. His Certificate, which is written in French, states—

"That on the 10th of April, 1821, he conveyed the weights in question from the "Maker's Office to the Department of *Conyoumgi Bachi Suleiman Effendi*, the Officer "who has the only authority to verify the accuracy of weights. This Officer having "carefully weighed and adjusted the Standards submitted to him (11 in number), "caused them to be stamped with the cypher of the Sultan *Mahmoud*, and with the "date 1236 (1821)—the weights thus marked being those only which are authorized by "the Turkish Government." He adds, "that at Constantinople the custom is to mark "the date upon all the weights every year."

Such are the means which have been employed by order of the British Government for obtaining a correct knowledge of the Metrology of Turkey. Similar attempts have been made at different periods by the Government of France, but with less satisfactory results. Thus, according to *M. Bonneville* ("*Traité des Monnaies*," p. 196), the Chequee of Constantinople, transmitted by order of the *Duc de Choiseul* to *M. Tillet*, in 1767, was found about $\frac{1}{5}$ per cent. lighter than that brought to Paris by the Ottoman Legation in 1797. The latter Standard is represented by *Bonneville* as defective in workmanship, but he gives no preference to either weight as to accuracy.

The following are the contents of the Turkish Chequee, reduced to English Grains, as stated by different authorities:

	Eng. Gr. Troy.
By *Paucton* and *Soulet*	4922
Kruse, *Ricard*, *Marien*, *Gerhart*, and *Dubost*	4925
Tillet, (transmitted by order of the *Duc de Choiseul*)	4933
Bonneville, (brought by the *Ottoman Legation*)	4942
Nelkenbrecker, p. 507	4969
Smyrna Chequee, transmitted for this Work in 1818	4957
Constantinople Chequee, transmitted for this Work in 1821	4950

The last result seems entitled to the greatest confidence, for the reasons already mentioned.*

* It should be stated that the Standards received from Constantinople were prepared under the superintendence of *John Carteright, Esq.* the British Consul General at that city, and transmitted by him to *Lord Viscount Castlereagh* (now *The Marquis of Londonderry*), in obedience to the Circular Order addressed by His Lordship to all British Consuls abroad (see Pref. p. xi.)

NOTICE.

☞ *It is intended, that any alterations of importance which may hereafter take place in the commercial regulations of countries, or in any other subjects contained in this Work, shall be published as supplementary matter, under the head* "**Addenda**," *and that copies of the same will be delivered gratis to all Purchasers of the Work, on application to their respective Booksellers.*

With a view to those occasional corrections and improvements, the communications of Merchants and other experienced persons are respectfully solicited by the Author.

THE

UNIVERSAL CAMBIST

AND

Commercial Instructor.

SECOND EDITION.

MARCHANT, Printer,
Ingram-Court, London.

THE

UNIVERSAL CAMBIST

AND

Commercial Instructor;

BEING A FULL AND ACCURATE TREATISE ON THE

EXCHANGES, MONIES, WEIGHTS, AND MEASURES,

OF ALL

TRADING NATIONS AND THEIR COLONIES;

WITH

AN ACCOUNT OF THEIR BANKS, PUBLIC FUNDS, AND PAPER CURRENCIES.

BY P. KELLY, LL.D.

MASTER OF THE FINSBURY-SQUARE ACADEMY, LONDON; AUTHOR OF DIFFERENT WORKS ON SCIENTIFIC SUBJECTS; AND MATHEMATICAL EXAMINER TO THE TRINITY HOUSE.

VOL. II.

The Second Edition,

INCLUDING

A REVISION OF FOREIGN WEIGHTS AND MEASURES,

FROM AN ACTUAL COMPARISON OF THEIR STANDARDS,

BY THE ORDER AND AID OF THE BRITISH GOVERNMENT.

LONDON:

PRINTED FOR THE AUTHOR,

AND PUBLISHED BY LACKINGTON AND CO. FINSBURY-SQUARE; LONGMAN AND CO. AND BALDWIN AND CO. PATERNOSTER-ROW; CADELL AND DAVIES, STRAND; R. HUNTER, ST. PAUL'S CHURCH-YARD; AND J. M. RICHARDSON, CORNHILL, OPPOSITE THE ROYAL EXCHANGE.

1821.

INTRODUCTION (TO VOL. II.),

CONTAINING EXPLANATIONS OF THE CHAIN RULE, WITH SUNDRY ILLUSTRATIONS RELATING TO EXCHANGE AND BULLION OPERATIONS.

EXCHANGE, which forms the leading subject of this volume, is a science of the first importance both in Commerce and Political Economy. By its direct and common application, foreign debts, loans, and subsidies are paid, and the wealth of nations circulated without the trouble or expense of remitting specie; and, by its more complex operations, (called Arbitrations of Exchange,) great profits are frequently made; and not only private fortunes are thus realized, but even public credit has been sometimes sustained by skilful Cambists and Negotiators.

A science, therefore, so highly interesting to nations, governments, and individuals, ought to be studied by Statesmen and Travellers, as well as by Merchants and all other persons concerned in foreign trade.

The Introduction to the First Volume of this work contains an Exposition of the Theory of Monies, Coins, Weights and Measures; and the Principles and Laws of Exchange are stated in the leading pages of the second volume; but, with a view to render the science still more easy and accessible, the chief methods of calculation are explained and illustrated in the present Introduction.

In order to study Exchanges with advantage, the following Rules should be well understood, namely—The Rule of Three, direct and inverse, single and compound; Fractions, vulgar and decimal; and the Chain Rule. The last mentioned only seems to require elucidation in this place, as all the rest are sufficiently well explained in books of common arithmetic.*

---

* THE CHAIN RULE (also called the *Rule of Exchange, Conjoint Proportion,* and the *Rule of Reduction,)* is indispensably necessary in the higher operations of Exchange, as well as in arbitrations of bullion, specie, and merchandise; and yet it does not appear to have been explained by English Authors with that attention which its great utility merits. Foreign Merchants are generally very expert in their application of this rule to commercial computations: and it is, in a great measure, to this that their acknowledged superiority in the science of Exchange may be attributed.

The CHAIN RULE consists of a series of terms which bear a certain proportion to each other, and which are accordingly arranged in two adjoining columns; the first to the left called *Antecedents*, and the second to the right called *Consequents*.

The Terms are arranged in the way of equations, and connected, as it were, like the links of a chain: and, however numerous they may be, the same result is obtained by one operation as by several statings in the Rule of Three.

This Rule, being chiefly useful in exchanges, is generally explained by examples of foreign monies, weights, or measures, but as such are seldom well understood by learners, they tend rather to obscure than to elucidate the subject. The following common articles are therefore first chosen as better adapted for illustration.

EXAMPLE I.—If 3 lb. of tea be worth 4 lb. of coffee, and 6 lb. of coffee worth 20 lb. of sugar, how many pounds of sugar may be had for 9 lb. of tea?

First, by the Double Rule of Three.

	lb. Tea.		lb. Coffee.			lb. Tea.		lb. Coffee.
As	3	:	4	:	:	9	:	12

and

	lb. Coffee.		lb. Sugar.			lb. Coffee.		lb. Sugar.
As	6	:	20	:	:	12	:	40

Hence, 9lb. of tea are worth 40lb. of sugar.

SOLUTION BY THE CHAIN RULE.

Distinguish the several Terms into Antecedents and Consequents, in the following manner:—

1. Enter on the right the given sum or Term on which the operation is to be performed, (which in the foregoing question is 9lb. of tea,) and call this the *Term of Demand*.

2. On the left of this term, and a step lower, enter the first Antecedent, which must be of the *same kind or name as the Term of Demand*, *and of the same value as the annexed Consequent*; thus, (according to the question,) 3lb. of tea = 4lb. of coffee.

3. In the same manner, let the second Antecedent be of the same name as

the second Consequent, and of the same value as the third Consequent; and so on for any given number of Terms: thus, 6 lb. of coffee = 20 lb. of sugar.

4. The Terms being thus arranged, divide the product of the Consequents by the Product of the Antecedents, and the quotient will be the answer in the denomination of the *last Consequent*. Thus

9 lb. tea.
3 lb. tea = 4 lb. coffee.
6 lb. coffee = 20 lb. sugar.

Hence $\frac{20 \times 4 \times 9}{6 \times 3} = \frac{720}{18} = 40$ lb. of sugar,—the answer.

By the above example it will be seen, that, in the arrangement of Antecedents and Consequents, each article is twice entered, except that sort in which the answer is required, and which is called the *Odd Term*. Here sugar is the Odd Term, and the answer must be in this denomination.

It should be also observed that no two entries of one denomination are in the same column; and, as they are placed in the way of equations, it is manifest that the quantities on both sides, which are equal to one another, are cancelled in the operation; and, therefore, the quotient or answer will be evidently in the denomination of the Odd Term, or last Consequent.

Proof of the Chain Rule.

This Rule may be proved by reversing the operation, that is, by what is called the *Doctrine of Contraries*, beginning with the Answer as the Term of Demand, and making the last Consequent correspond with the first Antecedent. Thus—

40 lb. sugar.
20 lb. sugar = 6 lb. coffee.
4 lb. coffee = 3 lb. tea.*

Then $\frac{40 \times 6 \times 3}{20 \times 4} = \frac{3 \times 3}{1 \times 1} = 9$ lb. of tea.

The operation of reducing a statement in this Rule may be abridged by striking out the same numbers when they occur in both columns, or by re-

* The above zigzag line is introduced to exemplify a method sometimes used for connecting the terms of a statement, and is therefore called the *Chain*. Its utility is obvious.

ducing them to a lower denomination where they admit of a common measure or divisor, as in reducing a vulgar fraction to its lowest terms.*

The Chain Rule exemplified by an Operation in Reduction, and also in the Single Rule of Three.

EXAMPLE II.—Let it be required to reduce £2 into farthings, supposing the pound = 20 shillings, the shilling = 12 pence, and the penny = 4 farthings.

2 Pounds,—Term of Demand.
1 Pound = 20 Shillings.
1 Shilling = 12 Pence.
1 Penny = 4 Farthings,—Odd Term.

Hence, $\frac{2 \times 20 \times 12 \times 4}{1 \times 1 \times 1} = 1920$ Farthings.

These farthings may be reduced to pounds by reversing the operation as before, that is, by making 1920 the Term of Demand, and £2 the Odd Term.

EXAMPLE III.—Let it be required to find the value of 7 yards of cloth, if 3 yards of the same be worth 45 shillings.

7 Yards,—Term of demand.
3 Yards = 45 Shillings,—Odd term.

Hence, $\frac{45 \times 7}{3} = 105s.$

From the above examples the principle of the Chain Rule is obvious, and it may be further demonstrated by an algebraic equation.

Thus, suppose x = the number of Shillings sought,
then x = the value of 7 Yards.
and 3 Yards = 45 Shillings;
Hence, $3x = 45 \times 7 = 315$
$x = \frac{315}{3} = 105s.$

Or thus,
As 3 : 45 :: 7 : x
Hence, $3x = 315$ and $x = 105s.$

* In finding a common measure it may be useful to observe the following properties of numbers:—
A number is divisible by 2, if the last figure be even; it is divisible by 4, if the two last figures be divisible by 4; and it is divisible by 8, if the three last figures be divisible by 8.
A number is divisible by 3, if the sum of the digits be divisible by 3; it is divisible by 6, if the last figure of such sum be even; and it is divisible by 9, if the sum of the digits be divisible by 9.
Every number is divisible by 5, if the last figure be a 5 or a cipher; and all ciphers may be equally suppressed at once from the Antecedents and Consequents.

The following investigation of the Chain Rule may be considered more comprehensive than the foregoing:

Suppose A, B, C, D, &c. to be several sorts of goods; and m, n, p, q, &c. given numbers; and the value of these goods are,

Antecedents.		Consequents.
m A	=	n B
p B	=	q C
r C	=	s D
t D	=	v E

To find what quantity of the last sort is equal to a given quantity of the first; and the reverse.

Let z times the last = y times the first; that is, let z E = y A.

Multiply all these equations together; the first side by the first, and the second by the second. Then we have mA × pB × rC × tD × zE = nB × qC × sD × vE × yA. Whence $mprtz = nqsvy$. Then if the quantity of the last sort be required, $z = \frac{nqsvy}{mprt}$. But if the quantity of the first sort be sought, $y = \frac{mprtz}{nqsv}$.

Whence the following general Rule, which is, in substance, that already given.

General Rule.

Place the Terms in two columns, so that there may not be two of a sort in either column. Divide the product of the numbers in the column which has the Odd Term, and the Term of Demand, by the product of the numbers in the other column. The quotient is the quantity of that sort which stands single.

It should be noticed that in the above demonstration there is no Term of Demand, as in the preceding examples; for here that Term is understood to be unity, and it may be placed over either column, according to the conditions of the question; observing that the product of the Terms of such column must be always the dividend.

It may be also remarked that the Term of Demand is, by some Authors, placed under the Consequents, instead of making it the first link of the chain, as in the present work. In both cases the results are the same; but there is this advantage in placing it above, that it serves as a direction to the first Antecedent, which must be of the same denomination.

By the Chain Rule the Proportions or Ratios between the Weights and Measures of different places may be thus determined :

EXAMPLE IV.—Suppose 10 lb. of London = 11 lb. of Rome, and 26 Marks of Spain = 16 lb. of London, what is the Ratio between the Roman Pound and the Spanish Mark?

1 lb. Rome.
11 lb. Rome = 10 lb. London.
16 lb. London = 26 Marks Spain.

Hence $\frac{1 \times 10 \times 26}{11 \times 16} = \frac{65}{44}$. Therefore 44 lb. of Rome = 65 Marks of Spain.

Or thus, let R = Rome, L = London, and S = Spain; then per question,

$$11\,R = 10\,L, \text{ and } 26\,S = 16\,L.$$

Hence $L = \frac{26\,S}{16}$ and $L = \frac{11\,R}{10}$ $\therefore \frac{11\,R}{10} = \frac{26\,S}{16}$ and $176\,R = 260\,S$, or $44\,R = 65\,S$.

EXAMPLE V.—Required the Proportion between the Metre of France and the Foot of Cremona, supposing that 48 of the latter = 56 English Feet, and that the Metre = 39,371 English Inches?

1 Foot of Cremona.
48 Feet Cremona = 56 Feet English.
1 Foot English = 12 Inches.
39,371 Inches = 1 Metre.

Result, $\frac{14}{39,371}$. Hence 14 Metres = 39,371 Feet, or 1 Metre = 2,812 Feet.

In determining Ratios of this kind, it is indifferent which of the Numbers to be compared is made the Leading Term; but when a given quantity or sum of money is to be reduced to another, it should be made the first consequent.

EXAMPLE VI.—Required the sterling value of a Kilogramme of Gold, $\frac{9}{10}$ fine, at £4 per Ounce Troy, $\frac{11}{12}$ fine?

1 Kilogramme.
1 Kilogramme = 15434 Troy Grains.
480 Grains = 1 Ounce.
10 Ounces Fr. stand. = 9 Ounces fine.
11 Ounces fine = 12 English standard.
1 Ounce Eng. stand. = 4 Pounds.

Result, £126:5:6

The Chain Rule exemplified by Foreign Monies.

Suppose £1000 sterling is to be remitted to Cadiz, and the direct Exchange is 40d. sterling per Piastre or Dollar of Exchange, but the Remitter wishes to send it through Holland and France; it is required to know which is the most advantageous, the direct or indirect Remittance; the Quotation of the Course of Exchange being as follows?—

London on Amsterdam, 10 Florins 10 Stivers per Pound sterling.
Amsterdam on Paris, 60 Pence Flemish for the Ecu of 3 Francs.
Paris on Cadiz, 15 Francs for 1 Doubloon of 4 Dollars of Exchange.

STATEMENT.

£1000 Sterling.

1 Pound Sterling	=	10½ Florins.
1 Florin	=	40 Pence Flemish.
60 Pence Flemish	=	3 Francs.
15 Francs	=	1 Doubloon.
1 Doubloon	=	4 Dollars.

$$\text{Hence } \frac{1000 \times 10{,}5 \times 40 \times 3 \times 4}{60 \times 15} = \frac{50400}{9} = 5600 \text{ Dollars.}$$

PROOF.

5600 Dollars.

4 Dollars	=	1 Doubloon.
1 Doubloon	=	15 Francs.
3 Francs	=	60 Pence Flemish.
40 Pence Flemish	=	1 Florin.
10½ Florins	=	1 Pound Sterling.

$$\text{Hence } \frac{5600 \times 15 \times 60}{4 \times 3 \times 40 \times 10{,}5} = \frac{5040000}{5040} = 1000 \text{ Pounds Sterling.}$$

From this operation it appears that, by the indirect exchange, £1000 sterling will produce 5600 Dollars, which gives the Dollar at 42⅞d. sterling.

Thus, the direct exchange is more profitable than the indirect to the *Remitter*, because he would obtain 6000 Dollars at 40*d.* each; whereas, by the circular remittance, he could receive only 5600: while, on the contrary, the indirect exchange would be most advantageous to the *Drawer* in the same proportion. But these different interests will be more fully exemplified under the article *Arbitration of Exchange.*

*New Arrangement of the Chain Rule.**

From the foregoing Examples it is obvious that the terms of the Chain Rule may be arranged horizontally, in the way of Fractions, making the Consequents the numerators and the Antecedents their denominators respectively; and the result may then be determined by multiplication; that is, by the common operation of reducing a compound fraction to an equivalent simple one.

Thus, let the Term of Demand be the numerator of the first fraction, observing that its denominator be of the same kind, and equal in value to the second numerator: the denominator of the second, of the same kind as its numerator, and of the same value as the third numerator; and so on until you arrive at the numerator of the kind sought, which is the Odd Term, and which is, of course, without a denominator.

This may be exemplified by the foregoing problem, p. xi.

Thus, let x = the number sought,

$$\text{Then } x = \frac{\text{£ sterl.}}{1000} \times \frac{\text{S.Flem.}}{35} \times \frac{\text{D.Flem.}}{12} \times \frac{\text{Fr.}}{3} \times \frac{\text{Doub.}}{1} \times \frac{\text{Doll.}}{4} = \text{Doll.}\ 5600.$$

Reverse operation.

$$x = \frac{\text{Doll.}}{5600} \times \frac{\text{Doub.}}{1} \times \frac{\text{Fr.}}{15} \times \frac{\text{D.Flem.}}{60} \times \frac{\text{S.Flem.}}{1} \times \frac{\text{£ st.}}{35} = 1000.$$

---

* This method of arranging the Chain Rule has been recently published at Paris, in *M. Soulet's Exchanges*, edited by *M. Garnier*. The following is his *Formula:*

$$x = \frac{a}{d} \;//\; \frac{b}{b'} \;//\; \frac{c}{c'} \;//\; \frac{d}{\quad} \;\&c.$$

By this Formula it is understood that a is the Term of Demand. Also, that a' is of the same kind as a, and in equation with b; that b' is of the same kind as b, and in equation with c; that c' is of the same kind as c, and in equation with d, and so on.

The signs of equality diagonally placed denote the equality between each denominator and the following numerator. The signs, however, of multiplication in the preceding examples seem to be equally proper.

This new method of arrangement is obviously more concise than the old; but what it gains in brevity it perhaps loses in perspicuity. It may, however, be sometimes used with advantage especially by persons who understand the old method.

Another kind of fractional arrangement is given in *Lacroix's Arithmetic*, where the denominators are removed each one place to the right. The following is his method (adopting *Garnier's* symbols)—

$$x = \frac{a}{\quad} \times \frac{b}{a'} \times \frac{c}{b'} \times \frac{d}{c'} \;\&c.$$

THE USE OF LOGARITHMS AND FIXED NUMBERS IN BULLION AND EXCHANGE OPERATIONS.

Although the application of Logarithms and Fixed Numbers in Exchange Calculations is explained in the present volume, p. 129, yet some additional illustrations and examples may be useful in this part of the work.

The use of Logarithms in all sciences is to diminish labour, as they perform by addition and subtraction what is obtained by the multiplication and division of common numbers. Hence, in the reduction of a statement of the Chain Rule, *if the Logarithms of the Consequents be added together, and from this sum the amount of the Logarithms of the Antecedents be subtracted, the difference will be the Logarithm of the answer.*

Or, *the same result may be obtained by adding to the said sum of the Consequents the arithmetical complement of the said sum of the Antecedents*, rejecting *ten* in the Index.

Tables of Logarithms are inserted in some books of exchange adapted to the subject; that is, there are negative Logarithms for fractional quantities, as well as positive for whole and mixed numbers; but all such may be deduced from the common tables, by the rules generally given. Thus, the Logarithm of a vulgar fraction is found by *reducing* it *to a decimal*; or by *subtracting the Logarithm of the Denominator from that of the Numerator.** *(See Dr. Hutton's Mathematical Tables, p.* 132.)

When fractions occur in the Chain Rule, the most convenient method is to convert them into whole numbers, by *multiplying the fractional quantity by the denominator, and also any term in the other column by the same figure.* Thus, an antecedent of $\frac{7}{12}$, and a consequent of 9 may stand 7 and 108, without altering the ratio. Or, 5 and $11\frac{3}{4}$ may be converted to 20 and 47. This method of clearing a statement of fractions greatly simplifies the operation; and when Logarithms are used there is no advantage in bringing terms to low denominations, unless such may be reduced to unity or expunged altogether; as it is as easy to find the Logarithm of a large number as of a small one.

---

* Tables of Logarithms, adapted to Exchanges and other commercial purposes, have been published by *Gerhardt*, of Berlin; *Reishammer* of Paris; and by *Bonhote*, *Dubost*, and *Preston*, of London.

Fixed Numbers are of great utility in exchanges, whether they are used as Logarithms or not. They are peculiarly convenient in bullion operations where the same kind of questions daily occur, as will be exemplified in the remaining part of this Introduction. But before the following Examples are studied, the Rules of Arbitration (p. 107) should be well understood.

In every long statement by the Chain Rule there are several constant or invariable proportions, as the number of shillings in a Pound, or of Penny-weights in an Ounce; and these may, by the rule of Reduction, be converted into one number only, which is called *Fixed*. Thus, in the foregoing example, p. xi., the figures 12, 3, and 4, are constant, and the Fixed Number thence obtained is 144, which, reduced with the other numbers, will give the solution $16 \times 50 \times 7 = 5600$.

In Example VI. page x. there is but one variable number; viz. £4, the price of an ounce of gold; and if the product of the other consequents be divided by that of the antecedents, the result will be 31,569, which will serve as a Fixed Number for all such questions; and this, multiplied by the price per ounce, will give the answer; thus, $31{,}569 \times £4 = £126{,}276$.

Now if the same Kilogramme had been bought at Paris for 3156 Francs 90 Centimes, the ratio between those two prices would give the *Course of Exchange*: for as 126,276 : 3156,90 : : £1 : 25 Fr. Thus the rate would be 25 Francs for 1 Pound sterling; but it should be observed that although the price of Bullion and the Course of Exchange generally regulate each other, yet extraordinary demands cause variations in their computed proportions, which variations, however, have a general tendency to correct themselves.

In Bullion operations the following proportions will be found useful:

		Eng. Oz. Troy.
60	Marks of Hamburgh or Cologne =	451
80	Marks of Amsterdam =	633
61	Oz. Paris, Poids de Marc =	60
1	Kilogramme =	32,154
31,1	Grammes =	1
5	Marks of Spain, or 250 Castellanos =	37
8	Marks of Portugal =	59
144	Oz. of Leghorn, or Florence =	131
100	Oz. of Naples =	86
11	Oz. of Rome =	10

			Oz. Eng. Stand. fineness.
1000	Spanish Dollars =	866 oz. Troy =	835
1000	Doubloons =	868 oz. Troy =	853
1000	Joanese, or Ports =		460
55	English ounces French Gold =		54
37	Ditto French Silver =		36
19	Marks fine Silver, Amsterdam =		164
34	Marks of Hamburgh Ducats =		273
8	Marks fine Silver of Hamburgh =		65
111	Oz. of Dollars =		107
48	Oz. of do. = 43 oz. of fine Silver.		

GOLD IN BARS.

To calculate the Course of Exchange from the Price of Bullion, and the contrary. Also to find Fixed Numbers for the Solution of such Questions.

EXAMPLE I.—**When Gold is sold at Hamburgh at 104 Sols banco per Ducat of 23½ Carats fine, and at London at 78s. 2d. per standard Ounce, what should be the Course of Exchange, supposing that 67 Ducats make 1 Cologne Mark fine, and that 60 Marks weigh 451 Ounces Tróy?**

		1 Pound sterling.
1 Pound sterling	=	20 Shillings.
78$\frac{1}{6}$ Shillings sterling	=	1 Ounce standard.
451 Ounces standard	=	60 Marks standard.
47 Marks $\frac{44}{48}$	=	44 Marks $\frac{47}{48}$.
1 Mark	=	67 Ducats.
1 Ducat	=	104 Shillings Lubs Banco.
6 Shillings Lubs B°.	=	1 Shilling Flemish.

As the prices of gold are the only variable numbers in the above statement, the Fixed Number may be thus determined:

$$\frac{20 \times 60 \times 44 \times 67}{451 \times 47} = 27{,}815, \text{ the Fixed Number.}$$

Hence, 27,815 × 104 ÷ 78$\frac{1}{6}$ = 37 Shillings, Flemish (the Course of Exchange) for £1 sterling.

By the above Fixed Number, with the course of exchange and the price of bullion in one place, it is plain that its price may be found in the other place.

EXAMPLE II.—**When Gold is sold at Amsterdam at an advance of 17 per cent. on the Tarif price of 355 Florins per Mark fine, and in London at 78s. per standard Ounce, what is the Course of Exchange, supposing that 80 Marks of Amsterdam weigh 633 Ounces English Troy?**

		1 Pound sterling.
1 Pound sterling	=	20 Shillings.
78 Shillings	=	1 Ounce standard.
12 Ounces stand.	=	11 Ounces fine.
633 Ounces fine	=	80 Marks of Amsterdam.
1 Mark	=	355 Florins.
100 Florins	=	117 with the Premium.

The invariable numbers in the above statement are

$\frac{20 \times 11 \times 80 \times 355}{12 \times 633 \times 100} = 8{,}225$ **the Fixed Number, which × 117 ÷ 78 = 12 Fl. 6¾ St. or 41s. 1d. Flemish per Pound sterling, the Course of Exchange.**

EXAMPLE III.—What is the Course of Exchange between Paris and London resulting from the price of Gold; viz. 8 per Mille premium on the Tarif-price, (see vol. i. p. 142,) and 78s. per Ounce English standard?

			1	Pound sterling.
1	Pound sterling	=	20	Shillings.
78	Shillings	=	1	Ounce standard.
12	Ounces standard	=	11	Ounces fine.
32,154	Ounces fine	=	1	Kilogramme fine.
1	Kilogramme fine	=	3434 f. 44 c.	Tarif price.
100	Francs	=	100,8	with the Premium.

The invariable numbers in the above statement are $\frac{20 \times 11 \times 3434\text{ f. }44}{12 \times 32{,}154 \times 100} = 19{,}5823$, the Fixed Number.

Hence $19{,}582 \times 100{,}8 \div 78 = 25$ fr. 30 c. per Pound Sterling, the Course of Exchange.

EXAMPLE IV.—If the price of Gold at Cadiz be 30 Reals per Castellano of $\frac{22\frac{1}{2}}{24}$ fine; and in London 934½d. per ounce standard, (the Mint price,) what is the Course of Exchange, &c.?

			1	Piastre.
1	Piastre	=	8	Reals.
30	Reals	=	1	Castellano.
44	Castellanos $\frac{45}{48}$	=	45	Castellanos $\frac{44}{48}$.
250	Castellanos	=	37	Ounces Troy.
1	Ounce	=	934½	Pence.

Reduced, gives the Course of Exchange = 37¼d. per Piastre.

The invariable Numbers are $\frac{8 \times 45 \times 37}{44 \times 250} = 14{,}531$, the Fixed Number.

EXAMPLE V.—If Gold be sold at Lisbon for 1700 Rees per Outava of $\frac{22}{24}$ fine, and in London at the Mint price, what is the Course of Exchange?

			1	Milree.
1	Milree	=	1000	Rees.
1700	Rees	=	1	Outava.
64	Outavas	=	1	Mark.
8	Marks	=	59	Ounces Troy.
1	Ounce	=	934½	Pence.

Reduced, gives 63⅓d. per Milree, the Course of Exchange.

The invariable Numbers are $\frac{1000 \times 59}{64 \times 8} = 115{,}234$, the Fixed Number.

EXAMPLE VI.—If the price of Gold at Leghorn be 108 Lire per Ounce fine, and in London the Mint price, what is the Course of Exchange, &c.?

		1	Pezza.
4 ×	1 Pezza	=	$5\frac{3}{4}$ Lire × 4 = 23.
	108 Lire	=	1 Ounce fine of Leghorn.
	144 Oz. of Leghorn	=	131 Ounce of London.
	11 Oz. fine	=	12 Ounces standard.
	1 Oz. standard	=	$934\frac{1}{2}$ Pence.

Reduced, gives 49,37d. per Pezza, the Course of Exchange.

The invariable Numbers are $\frac{23 \times 131 \times 12}{4 \times 144 \times 11} = 5{,}706$, the Fixed Numbers.

The foregoing Examples solved by Logarithms.

Hamburgh,	Fixed Number,....	27,815	Log.....	1,44428
	Hamburgh Price,..	104	Log.....	2,01703
	London Price, ...	$78\frac{1}{6}$	Ar. Com.*	8,10798
	Course of Exchange	37,091	Log.....	1,56929
Amsterdam,	Fixed Number,....	8,225	Log.....	0,91514
	Amsterdam Price,..	117	Log.....	2,06819
	London Price, ...	78	Ar. Com.	8,10790
	Course of Exchange,	12,338	Log.....	1,09123
Paris,	Fixed Number, ...	19,582	Log.....	9,29186
	Paris Price, ...	100,8	Log.....	3,00346
	London Price, ...	78	Ar. Com.	8,10790
	Course of Exchange,	25,30	Log.....	1,40322
Cadiz,	Fixed Number,....	1,201	Log.....	0,08310
	London Price,.....	934,5	Log.....	2,97057
	Cadiz Price, ...	30	Ar. Com.	8,52287
	Course of Exchange,	37,72	Log.....	1,57654

* The Arithmetical Complement is found by subtracting the Logarithm of the given Number from 10, and thus the operation is performed by addition only, and with four rows of figures instead of five. See p. 130.

Lisbon,	Fixed Number, ...	115,23	Log.....	2,06156
	London Price,.....	934,5	Log.....	2,97057
	Lisbon Price, ...	1700	Ar. Com.	6,76955
	Course of Exchange,	63,34	Log.....	1,80169
Leghorn,	Fixed Number, ...	5,706	Log.....	0,75633
	London Price,.....	934,5	Log.....	2,97057
	Leghorn Price, ...	108	Ar. Com.	7,96657
	Course of Exchange,	49,37	Log.....	1,69347

SILVER IN BARS.

To find the Course of Exchange between London and the foregoing Places, resulting from the following Prices of Silver, viz.

Hamburgh,.....	27	Marks Banco, per Cologne Mark fine.
Amsterdam, ...	26	Florins, per Mark fine.
Paris,.....	3	per Cent. Premium on the Tarif price of 218 Fr. 89 c. per Kilogramme fine.
Cadiz,.....	108	Reals of Plate, per Mark fine.
Lisbon, ...	990	Rees, per Ounce fine.
Leghorn, ...	64	Lire, per Libra of 12 Ounces fine.
London,.....	58	Pence, per Ounce $\frac{37}{40}$ fine.

STATEMENTS AND RESULTS, (see p. xii. and xiv. also p. 19, Vol. II.)

	£ ster.		Pence.		Oz. stan.		Oz. fine.		Mks.		Mks Bo.		8 Flem.	Course of Ex.	Fixed Num
Hamburgh,..	$\frac{1}{1}$	×	$\frac{240}{58}$	×	$\frac{1}{40}$	×	$\frac{37}{451}$	×	$\frac{60}{1}$	×	$\frac{27}{3}$	×	$\frac{8}{—}$	= 36,66	78,758
Amsterdam,.	$\frac{1}{1}$	×	$\frac{240}{58}$	×	$\frac{1}{40}$	×	$\frac{37}{633}$	×	$\frac{80}{1}$	×	$\frac{26}{—}$ Flor.			= 12,57	28,057
Paris,.....	$\frac{1}{1}$	×	$\frac{240}{58}$	×	$\frac{1}{40}$	×	$\frac{37}{32,154}$	×	$\frac{218,89}{100}$	×	$\frac{103}{—}$			= 26,83	15,113
	Piastre.		Reals.		Mks.		Mks fine.		Oz. st.		Pence.				
Cadiz,.....	$\frac{1}{1}$	×	$\frac{8}{104}$	×	$\frac{1}{5}$	×	$\frac{37}{37}$	×	$\frac{40}{1}$	×	$\frac{58}{—}$			= 37,72	64,000
	Millrei.		Rees.		Oz.		Oz. fine.		Oz. st.		Pence.				
Lisbon,.....	$\frac{1}{1}$	×	$\frac{1000}{990}$	×	$\frac{1}{64}$	×	$\frac{59}{37}$	×	$\frac{40}{1}$	×	$\frac{58}{—}$			= 58,38	996,621
	Pezza.		Lire.		Oz. Leg.		Oz. Tr.		Oz. st.		Pence.				
Leghorn,....	$\frac{1}{1}$	×	$\frac{5\frac{3}{4}}{84}$	×	$\frac{12}{144}$	×	$\frac{131}{37}$	×	$\frac{40}{1}$	×	$\frac{58}{—}$			= 46,35	67,860

There are three variable numbers in each of the foregoing statements; viz. the price of Foreign Bullion, the London Price, and the Course of Exchange. Now, it is obvious that if any two of these prices be given, the third may thence be found by the help of the Fixed Number. Suppose, for example, in the last statement respecting Paris, that F = the Fixed Number, p = the Paris price, l = the London price, and c = the Course of Exchange, then c, l, or p, may be found, the rest being known. Thus

$$c = \frac{Fp}{l} = \frac{15{,}113 \times 103}{58} = 26{,}83 \text{ Francs for the £1 sterling.}$$

$$l = \frac{Fp}{c} = \frac{15{,}113 \times 103}{26{,}83} = 58 \text{ Pence per Ounce sterling.}$$

$$p = \frac{c\,l}{F} = \frac{26{,}83 \times 58}{15{,}113} = 103 \text{ Francs per Kilogramme fine.}$$

The above Equations will answer for all other places to which London gives the certain, (see p. 13, vol. ii.) but where it gives the uncertain, as to Cadiz, the following will be the Formulæ, supposing s to represent the Spanish or Cadiz price.

$$c = \frac{Fl}{s} = \frac{64 \times 58}{104} = 37{,}72 \text{ Pence per Piastre.}$$

$$s = \frac{Fl}{c} = \frac{64 \times 58}{37{,}72} = 104 \text{ Reals per Mark.}$$

$$l = \frac{s\,c}{F} = \frac{104 \times 37{,}72}{64} = 58 \text{ Pence per Ounce.}$$

These Formulæ will apply to operations in Gold as well as Silver, always reckoning the prices in the denominations here laid down; and where the calculations are laborious Logarithms may be introduced with advantage, but, in ordinary cases, common numbers seem more convenient and intelligible.

When speculations are made in Coins, the readiest method is to find their pure contents from the Table of Assays in the present Volume, p. 157.

ERRATA.—(Vol. II.)

Page xii. lines 17 and 20, for 35s. Flemish, read 10½ Florins, and for 12d. Flemish, read 40d. Flemish.

47, line 5, for 3 Pfenings, read 18.

49, Francfort Exchange, for 75, &c. read 3 per cent. which is an agio or discount in comparing 23 Florins with 60 Livres.

75, column 1, line 10, after 34, insert × 2,312.

93, line 9, for 30,467, read 20,467.

Page 142, line 25, for 62 Pence, read 934½.

142, line 26, for 40 Ounces standard, read 12; and for 37 Ounces fine Silver, read 11 Ounces fine Gold.

143, line 12, for 73 Centimes, read 75.

222, Florence, for 339,542, read 339,510.

226, Milan, for 594,530, read 59,453; and for 665,874, read 66,587.

232, Salonica Killow, for 1184 Cubic Inches, read 11840.

N.B. It is recommended that the above Errors be corrected with the Pen before the Work is consulted on any Question of Business.

TABLE OF CONTENTS.

VOLUME II.

EXCHANGE.

EXCHANGE is the act of paying or receiving the money of one country for its equivalent in the money of another country, by means of Bills of Exchange. This operation, therefore, comprehends both the reduction of monies and the negotiation of bills; it determines the comparative value of the currencies of all nations; and shows how foreign debts are discharged, loans and subsidies paid, and other remittances made from one country to another, without the risk, trouble, or expense of transporting specie or bullion. Exchange.

The subject is here considered under the four following heads:—

1.—*Bills of Exchange*; with customs, laws, and regulations relating to the same.

2.—*Principles of Exchange*; comprehending the *Par of Exchange*, with various views of the subject; and the *Course of Exchange*, with the common causes of its fluctuation.

3.—*Monies of Exchange*; with the quotations explained, and rules and examples of calculation.

4.—*Arbitration of Exchange*; with rules and examples for negotiating bills to the greatest advantage: also operations in specie, bullion, and merchandize.

1.—BILLS OF EXCHANGE.

A BILL of Exchange is a written order for the payment of a certain sum of money at an appointed time. It is a mercantile contract, in which four persons are mostly concerned, *viz.* Bills of Exchange.

1.—The *Drawer*, who receives the value, and is also called the *Maker* and *Seller* of the Bill.

Bills of Exchange.

2.—His debtor in a distant place, upon whom the Bill is drawn, and who is called the *Drawee*. He also is called the *Acceptor*, when he accepts the Bill, which is an engagement to pay it when due.

3.—The person who gives value for the Bill, who is called the *Buyer*, *Taker*, and *Remitter*.

4.—The person to whom it is ordered to be paid, who is called the *Payee*, and who may, by indorsement, pass it to any other person.

Most mercantile payments are made in Bills of Exchange, which generally pass from hand to hand, until due, like any other circulating medium; and the person who at any time has a Bill in his possession, is called the *Holder*.

When the Holder of a Bill disposes of it, he writes his name on the back, which is called *Indorsing*; and the Payee should be the first Indorser. If the Bill be indorsed in favour of any particular person, it is called a *Special Indorsement*, and the person to whom it is thus made payable is called the *Indorsee*, who must also indorse the Bill if he negotiates it. Any person may indorse a Bill, and every Indorser (as well as the Acceptor or Payee) is a security for the Bill, and may therefore be sued for payment.

The *Term* of a Bill varies, according to the agreement between the parties, or the custom of countries. Some Bills are drawn at sight; others at a certain number of days or months after sight or after date; and some at *Usance*, which is the customary or usual term between different places.

Days of Grace are a certain number of days granted to the Acceptor after the term of a Bill is expired. In the British Dominions, three days are allowed.

In reckoning when a Bill, payable after *date*, becomes due, the day on which it is dated is not included; and if it be a Bill payable after *sight*, the day of presentment is not included. When the term is expressed in months, calendar months are understood; and when a month is longer than the succeeding, it is a rule not to go, in the computation, into a third month. Thus, if a Bill be dated the 28th, 29th, 30th, or 31st of January, and payable one month after date, the term equally expires on the last day of February, to which the days of grace must, of course, be added; and, therefore, the Bill becomes due on the 3d of March.

No Bill of Exchange drawn in Great Britain or Ireland can be negotiated, presented for payment, or in any way admitted as good in these countries, that is not written on a proper stamp; and any person drawing, accepting, or paying such a Bill, is liable to a penalty.

LAWS OF EXCHANGE.

The following Laws have been selected from the first legal authorities, and likewise examined and approved by several experienced Merchants, Bankers, and Notaries; and though these Laws apply chiefly to the British Dominions, yet they do not differ essentially from the regulations of other commercial Countries, with respect to ACCEPTING, INDORSING, PAYING, PROTESTING, *and* RECOVERING BILLS.

ACCEPTING BILLS.

Accepting Bills.

WHEN a Bill is presented for acceptance, it is generally left until the next day; and the common way of accepting is for the Drawee to write his name at the bottom or across the body of the Bill, with the word *accepted*. An acceptance, however, in a slighter way, has been heretofore deemed binding; thus had the Drawee written his name upon any part of the Bill, or the initials of his name, or the day of the month, or merely the word *accepted*, he was considered liable; but by an Act of Parliament passed in 1819, it was declared, "that no person shall be bound or charged as Acceptor of an Inland or Foreign Bill of Exchange, otherwise than by an acceptance of such Bill of Exchange written thereon or on some one part of such Bill, if the same shall consist of more than one part."

When two or more persons are in partnership, the acceptance of one binds all the others, if the Bill concerns their joint trade; but if it should be made known to the person who receives the Bill that it concerns the Acceptor only in a distinct interest, he alone, as Acceptor, can be sued.

A clerk, or servant, may accept a Bill for his master, when he has authority for that purpose, or if he usually transacts business of this nature for him; and his acceptance binds the master.

But if the Bill be drawn nominally on the servant, directing him to place it to the account of his master, and if the servant should accept it generally, without specifying that he does it for his master's account, the acceptance binds the servant only, and not his employer.

Accepting Bills.

When a Bill is drawn for the account of a third person, and is accepted as such, and he fails without making provision for its payment, the Acceptor must discharge the Bill, and can have no recourse against the Drawer.

A Bill may be accepted to be paid at a longer period than is mentioned in the Bill, or to pay a part of the sum only: such an acceptance is binding on him who makes it; but the Holder is at liberty to take it as it is offered, or to act as if acceptance had been entirely refused.

The acceptance may direct payment to be made at a place different from that mentioned in the Bill, as at the house of a banker; in which case, if the Holder should neglect to demand payment within a reasonable time, and the banker should afterwards fail, the Holder must sustain the loss.

When a Bill has been once accepted, the acceptance cannot be revoked, though the Drawer should be found to have failed before the date of the acceptance.

INDORSING BILLS.

Indorsing Bills.

BILLS payable to bearer are transferred by simple delivery, and without any indorsement; but, in order to transfer a Bill payable to order, the Holder must express his order of paying to another person, which is always done by an indorsement.

An indorsement may be blank or special. A *blank indorsement* consists only of the Indorser's name, and the Bill then becomes transferable by simple delivery; a *special indorsement* orders the money to be paid to some particular person, or to his order: a blank indorsement may always be filled up with any person's name, so as to make it special.

An indorsement may take place at any time after the Bill is issued, even after the day of payment is elapsed.

A person who receives a Bill with a blank indorsement may take it as Indorsee, negotiate it again, or demand payment on his own account, or he may receive the money as agent, or for the account of the Indorser; and the latter, notwithstanding his indorsement, may still appear as Holder in an action against the Drawer or Acceptor.

A special indorsement needs not contain the words, *to order*, and the Bill is negotiable; it may also be restrictive, giving authority to the Indorsee to receive the money for the Indorser, but not transfer the Bill again to another.

An indorsement for part of the money only is not valid, except with regard to him who makes it: the Drawer and Acceptor are not bound by it. Indorsing Bills.

When the Holder of a Bill dies, his Executors may indorse it; but, by so doing, they become answerable to their Indorsee personally, and not as Executors.

PAYING BILLS.

Bills should be presented for payment, as well as for acceptance, during the usual hours of business, which are generally considered to be from nine o'clock in the morning till six in the evening. The common mode of payment among merchants is by a draft on a banker for the exact amount of the Bill, and signed by the Drawee; but any paper whatever may be refused, except Bank of England notes; and the Bank receives no other. Paying Bills.

PROTESTING BILLS.

When acceptance or payment has been refused, the Holder of the Bill should give regular and immediate notice to all the parties, to whom he intends to resort for payment; and if, on account of unnecessary delay, a loss should be incurred by the failure of any of the parties, the Holder must bear the loss. Protesting Bills.

With respect to the manner in which notices of non-acceptance or non-payment are to be given, a difference exists between Inland and Foreign Bills.

For Foreign Bills, a Protest is indispensably necessary: thus a Public Notary is to appear with the Bill, and to demand either acceptance or payment; and on being refused, he is to draw up an instrument, called a Protest, expressing that acceptance or payment has been demanded and refused, and that the Holder of the Bill intends to recover any damages which he may sustain in consequence. This instrument is admitted, in foreign countries, as a legal proof of the fact.

The Protest on a Foreign Bill should be made in time to be sent off on the next post-day to the place where it was drawn or negotiated; and if it be for non-payment, the Bill must be sent with the Protest.

As to Inland Bills, a Protest is not absolutely necessary to entitle the Holder to recover the amount of the Bill from the Drawer or Indorsee: it is sufficient that he give notice, by letter or otherwise, that acceptance or payment has been refused, and that he does not mean to give credit to the Drawee.