

## VALUATION OF BULLION.

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### THE STANDARDING OF GOLD AND SILVER.

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The standarding of Gold and Silver is the calculation of the quantity of standard Gold or Silver that is contained in, or that could be obtained from, the full weight of the given metal, according to the assay report of its fineness.

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The British standard purity of Gold is 22 Carats of fine Gold out of 24 Carats full weight of metal. The Gold Carat is a nominal weight divided into 4 Grains, each of which is subdivided into Quarter or Half-Quarter-Grains.

If the 24 Carats are reckoned one Pound in weight, then 1 Carat equals 10 Dwts Troy, 1 Carat Grain equals 2 Dwts 12 Grains Troy, and 1 Quarter-Carat Grain equals 15 Grains Troy.

The British standard purity of Silver is 11 Oz. 2 Dwts of fine Silver out of 12 Oz. full weight of metal. The Ounce is 20 Pennyweights, and in assays of Silver, the Pennyweight is divided into Half Pennyweights.

The reports of the purity of the metal tried or assayed, are, by English assayers, made in comparison with these standards, and the comparative difference is called its Betterness or Worse-ness.

Thus, Gold 23 Carats 3 Grains fine, is called Better 1 Carat 3 Grains; and Gold 20 Carats 1 Grain fine, Worse 1 Carat 3 Grains.

Also, pure Silver, or Silver 12 Oz. fine, is said to be Better 18 Dwts; and Silver which is only 10 Oz. fine, is reported Worse 1 Oz. 2 Dwts

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N. B. The British Standards are the mintage Purities of the Gold and Silver Coins of the Realm.

## TO FIND THE STANDARD WEIGHT OF GOLD.

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Multiply the full weight by the number of Carats, take parts for the Grains, and divide the amount by 22, for the Betterness or Worseness.

( or )

Take parts out of the full weight, for the report out of 22 Carats, and the amount will be the Betterness or Worseness.

Then add the Betterness, or subtract the Worseness, to or from the full weight, and the sum or remainder will be the standard weight.\*

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Gold in large quantities is not weighed with greater nicety than to 12 Grains, but the standard weight is calculated to 1 Grain.

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### EXAMPLE.

To find the standard weight of 48 lb 11 oz. 7 dwts 12 grs of Gold, reported Worse 1 car.  $3\frac{1}{2}$  grs.

|               | lb   | oz  | dw | gr |    |                       |
|---------------|------|-----|----|----|----|-----------------------|
| $\frac{1}{2}$ | . .  | 48  | 11 | 7  | 12 | . for 1 carat.        |
| $\frac{1}{2}$ | . .  | 24  | 5  | 13 | 18 | . . . 2 grains.       |
| $\frac{1}{2}$ | . .  | 12  | 2  | 16 | 21 | . . . 1 —             |
| $\frac{1}{2}$ | . .  | 6   | 1  | 8  | 10 | . . . $\frac{1}{2}$ — |
|               |      | 3   | 0  | 14 | 5  | . . . $\frac{1}{4}$ — |
| —————         |      |     |    |    |    |                       |
|               | 2 )  | 94  | 10 | 0  | 18 |                       |
| —————         |      |     |    |    |    |                       |
|               | 11 ) | 47  | 5  | 0  | 9  |                       |
| —————         |      |     |    |    |    |                       |
|               |      | 4   | 3  | 14 | 14 | Worseness.            |
| —————         |      |     |    |    |    |                       |
| lb            |      | 44  | 7  | 12 | 22 | Standard.             |
| —————         |      |     |    |    |    |                       |
| Oz.           |      | 535 | 12 | 22 |    |                       |
| —————         |      |     |    |    |    |                       |

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\* The standard weight is also called the pay-weight.

TO REDUCE THE FULL WEIGHT OF GOLD TO THE FINE WEIGHT.

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Find the standard weight, and subtract from it the 1-12 th part;  
( or )

To 22 Carats add the report if Better, or from 22 Carats subtract the report if Worse, to find the Carats fine; then multiply the full weight by the number of these Carats, and take parts for the Grains, and divide the amount by 24.

N. B. Sometimes it may be shorter to take parts for the Carats fine out of 24 Carats; or to take parts for their deficiency out of 24 Carats, to find the allowance for alloy.

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EXAMPLE 1.

To find the fine weight of 48 lb 11 oz. 7 dwts. 12 grs. of Gold, reported Worse 1 car.  $3\frac{3}{4}$  grs.

The standard weight by the preceding example, is

|                |     |     |    |    |           |
|----------------|-----|-----|----|----|-----------|
|                |     | oz  | dw | gr |           |
| $\frac{1}{12}$ | - - | 535 | 12 | 22 | Standard. |
|                |     | 44  | 12 | 18 | Alloy.    |
|                |     |     |    |    |           |
| Oz.            |     | 491 | 0  | 4  | Fine.     |
|                |     |     |    |    |           |

( or )

22 carats, less 1 car.  $3\frac{3}{4}$  grs. = 20 car.  $0\frac{1}{4}$  gr. fine.

|                 |     |     |    |    |                     |
|-----------------|-----|-----|----|----|---------------------|
|                 |     | oz  | dw | gr |                     |
| $\frac{1}{3}$   | - - | 587 | 7  | 12 | Full Weight.        |
| $\frac{1}{2}$   | - - |     |    |    |                     |
|                 |     | 293 | 13 | 18 | for 12 car.         |
| $\frac{1}{128}$ | - - | 195 | 15 | 20 | — 8 —               |
|                 |     | 1   | 10 | 14 | — $\frac{1}{4}$ gr. |
|                 |     |     |    |    |                     |
| Oz.             |     | 491 | 0  | 4  | Fine Weight.        |
|                 |     |     |    |    |                     |

## EXAMPLE 2.

To find the fine weight of 4 dwts.  $5\frac{3}{4}$  grs of Gold, reported Better 1 car.  $3\frac{1}{2}$  grs.

$$22 \text{ Carats and 1 car. } 3\frac{1}{2} \text{ grs} = 23 \text{ car. } 3\frac{1}{2} \text{ grs.}$$

|                     | dw | gr                                         |                                 |
|---------------------|----|--------------------------------------------|---------------------------------|
| $\frac{1}{192}$ - - | 4  | 5.75                                       | for 24 Carats, fine.            |
|                     |    | 0.53                                       | - - $\frac{1}{2}$ Grain, alloy. |
|                     |    | <hr style="width: 50px; margin: 0 auto;"/> |                                 |
| Dwts                | 4  | 5.22                                       | grs fine weight.                |
|                     |    | <hr style="width: 50px; margin: 0 auto;"/> |                                 |

23 Carats  $3\frac{1}{2}$  Grains fine, make only  $\frac{1}{2}$  Grain of alloy in 24 Carats full weight; hence as 1 Grain is the 96 th part of 24 Carats, for the  $\frac{1}{2}$  Grain we take the 192 nd part.

When the fine as well as the standard weight is required, it is frequently better, first to find the fine weight, and then to find the standard weight by adding 1-11 th part to it, as

|                    | dw | gr                                         |           |
|--------------------|----|--------------------------------------------|-----------|
| $\frac{1}{11}$ - - | 4  | 5.22                                       | Fine.     |
|                    |    | 9.20                                       | Alloy.    |
|                    |    | <hr style="width: 50px; margin: 0 auto;"/> |           |
| Dwts. -            | 4  | 14.42                                      | Standard. |
|                    |    | <hr style="width: 50px; margin: 0 auto;"/> |           |

The reason of this evidently is, because 11 Oz. of fine Gold will make 12 Oz. of standard Gold;\* and therefore the alloy to be added to fine Gold, or taken from standard Gold, to change the one into the other, is 1-11 th of the fine weight or 1-12 th of the standard weight.

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\* That 1 Carat Better or Worse should require 1-22 nd part of the whole weight (and that any other quantity should require a proportional product) to be added or subtracted to reduce it to standard, is also evident from the nature of the report; for 1 Carat Worse means that in 22 Ounces of the given Metal, there is 1 Ounce too much of alloy; and therefore the weight of standard Gold which it contains, is only 21 Ounces: this may be proved thus—Worse 1 Carat, is 21 Carats fine; which means that 21-24 ths of the Metal is fine Gold.—Out of 22 Ounces therefore of this quality of Gold, 21-24 ths or  $19\frac{1}{4}$  Oz. are fine Gold; but 1-11 th of the weight of fine Gold is the alloy required to reduce it to standard Gold, and 1-11 th of  $19\frac{1}{4}$  Oz. is  $1\frac{3}{4}$  Oz. the weight of the alloy, which added to the  $19\frac{1}{4}$  Oz. makes 21 Oz. of standard Gold, and gives the same result as before.

TO FIND THE VALUE OF GOLD.

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Gold is valued either from the full weight, by a price varying according to the variation in purity, being about 3 s 6 d per Carat, and  $10\frac{1}{2}$  d per Grain if Better, or 4 s per Carat and 1 s per Grain if Worse, the latter allowance being the greater to defray the expense of refining;—or by the Market Price per Oz. Standard, from the quantity of standard Gold;—or by the fixed Mint Price of Gold, which is £ 3 17 10 $\frac{1}{2}$  per Oz. Standard; the latter being the rate usually set upon Coins for determining their intrinsic value as Money.

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EXAMPLE I.

To find the value of 14 lb 3 oz. 11 dwts 12 grs of Doubleloon Gold at 76 s per oz.

14 lb 3 oz. 11 dwts 12 grs = 171 oz. 11 dwts 12 grs.

|                   | £   | s  | d |                |
|-------------------|-----|----|---|----------------|
| $\frac{1}{2}$ - - | 171 | 11 | 6 | amount at 20 s |
|                   |     |    | 4 |                |
|                   |     |    |   |                |
|                   | 686 | 6  | 0 | - - 80 s       |
|                   | 34  | 6  | 4 | - - 4 s        |
|                   |     |    |   |                |
| £                 | 651 | 19 | 8 | - - 76 s       |
|                   |     |    |   |                |

N. B. At 20 s per oz. every dwt is worth 1 s and every grain  $\frac{1}{2}$  d; therefore we take as many pounds and shillings as there are oz. and dwts, and half as many pence as there are grains.

## EXAMPLE 2.

To find the amount of 11 lb 8 oz. 7 dwts 12 grs of Gold, reported Worse 0 Car. 2 grs, at 77 s 6 d per Oz. Standard.

|               |     |     |    |    |    |                     |
|---------------|-----|-----|----|----|----|---------------------|
|               |     | lb  | oz | dw | gr |                     |
| $\frac{1}{2}$ | - - | 11  | 8  | 7  | 12 |                     |
|               |     |     |    |    |    |                     |
| 2             | )   | 5   | 10 | 3  | 18 | for 2 grs.          |
|               |     |     |    |    |    |                     |
| 11            | )   | 2   | 11 | 1  | 21 |                     |
|               |     |     |    |    |    |                     |
|               |     |     | 3  | 3  | 19 | Worseness.          |
|               |     |     |    |    |    |                     |
| lb            |     | 11  | 5  | 3  | 17 | Standard.           |
|               |     |     |    |    |    |                     |
| oz            |     | 137 | 3  | 17 |    | at £ 3 17 6 per Oz. |
|               |     |     |    |    |    |                     |

|               |     |     |    |                |           |
|---------------|-----|-----|----|----------------|-----------|
|               |     | £   | s  | d              |           |
| $\frac{1}{8}$ | - - | 137 | 3  | $8\frac{1}{2}$ |           |
|               |     |     |    | 4              |           |
|               |     |     |    |                |           |
|               |     | 548 | 14 | 10             | for 80 s  |
|               |     | 17  | 3  | 0              | — 2 s 6 d |
|               |     |     |    |                |           |
| £             |     | 531 | 11 | 10             |           |
|               |     |     |    |                |           |

It is of no consequence whether the pounds are reduced into ounces before or after the standard weight is found ; but at the Bank it is usual to cast out the Betterness or Worseness as above : with private dealers, it is rather more common to reduce the full weight into ounces.

N. B. In the practice of business the Worseness of Gold is calculated to the nearest grain.

EXAMPLE 3.

To find the standard and fine weights and the value at 77 s 10½ d per Oz. Standard, of a Prussian Double Frederick d'or weighing dwts 8 14 grs and reported Worse 2 grs.

|        |         |          |                     |
|--------|---------|----------|---------------------|
|        | dw      | gr       |                     |
|        | 8       | 14       |                     |
| ½ - -  | 206     |          | Grains.             |
| 2 )    | 103     |          | for 2 Grains Worse. |
| 11 )   | 51.5    |          |                     |
|        | 4.681   |          | Worseness.          |
| ½ - -  | 201.319 |          | Grains, Standard.   |
|        | 16.776  |          | Alloy.              |
| Grains | 184.543 |          | Fine.               |
| Grains | 201.319 | = 8 dwts | 9.319 grs.          |
|        | s       | d        |                     |
| ⅓ - -  | 8       | 4.659    | * Value at 20 s     |
|        |         | 4        |                     |
|        | 33      | 6.636    | — — 80 s            |
| ⅓ - -  | 10.065  |          | — — 2 s             |
|        |         | .629     | — — 1½ d            |
| s      | 32      | 7.942    | — — 77 s 10½ d      |

Products — Standard Weight 8 dwts 9.31 grs.  
 Fine Weight 184.54 Grains—Value 32 s 7.94 d.

N. B. For greater exactness, even when the results are given in hundredths, the remainders may be extended, as above, to the third place of decimals.

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\* This 4.659 d is found by dividing 9.319, the number of the Grains, by 2.

## EXERCISES.

Ex. 1. Find the weight of standard Gold contained in 11 lb 10 Oz. 16 Dwts of Gold, reported Worse 2 Car. 2 Grs.

2. Find the weight of standard Gold contained in 16 lb 4 Oz. 11 Dwts 12 Grs of Gold, reported Better 0 Car.  $1\frac{3}{4}$  Gr.

3. Find the weight of standard Gold contained in 8 Dwts  $4\frac{3}{4}$  Grs. of Gold, reported Better 0 Car.  $1\frac{1}{2}$  Gr.

4. Find the weight of standard Gold contained in 2 Dwts  $5\frac{3}{4}$  Grs. of Gold, reported Better 1 Car.  $3\frac{3}{4}$  Grs.

5. What is the weight of fine Gold contained in 9 lb 11 Oz. 14 Dwts 12 Grs of Gold, reported Worse 0 Car.  $3\frac{1}{2}$  Grs ?

6. What is the weight of fine Gold contained in a Coin, weighing 5 Dwts  $8\frac{1}{2}$  Grs. reported Worse 0 Car.  $\frac{1}{4}$  Gr ?

7. What is the value of 4 lb 7 Oz. 4 Dwts 12 Grs of Gold, at 74 s per Oz. ?

8. What is the value of 21 lb 10 Oz. 18 Dwts 12 Grs. of Gold, reported Worse 1 Car.  $3\frac{1}{4}$  Grs. at 77 s 6 d per Oz. Standard ?

9. What are the standard and fine weights of the following Coins, and what are their values at 77 s  $10\frac{1}{2}$  d per Oz. Standard ?

| Country.     | Names.            | dwt | gr             | Report         | C              | gr                     |  |
|--------------|-------------------|-----|----------------|----------------|----------------|------------------------|--|
| French . .   | Napoleon . Weight | 4   | $3\frac{1}{2}$ | 0              | $1\frac{3}{4}$ | Worse.                 |  |
| ———— . .     | Doub. Lou. 48 L.— | 9   | 20             | —              | 0              | $1\frac{1}{2}$ W       |  |
| Dutch . .    | Ducat . .         | —   | $2\frac{5}{8}$ | —              | 1              | $2\frac{1}{4}$ Better. |  |
| ———— . .     | 10 Florins .      | —   | $7\frac{3}{4}$ | —              | 0              | $1\frac{3}{4}$ W       |  |
| Hanoverian   | George d'or .     | —   | $6\frac{1}{2}$ | —              | 0              | $1\frac{1}{4}$ W       |  |
| Danish . .   | Christian d'or    | —   | 7              | —              | 0              | 1 W                    |  |
| Austrian . . | Half-Sovereign    | —   | 3              | 14             | —              | 0 $0\frac{1}{4}$ W     |  |
| ———— . .     | Ducat . .         | —   | 2              | $5\frac{7}{8}$ | —              | 1 $2\frac{3}{4}$ B     |  |
| Russian . .  | Imperial . .      | —   | 4              | $3\frac{1}{2}$ | —              | Standard.              |  |
| Bavarian . . | Max d'or . .      | —   | 4              | 4              | —              | 3 $2\frac{1}{4}$ W     |  |
| Portuguese   | Dobraon . .       | —   | 34             | 12             | —              | Standard.              |  |
| ————         | Joannese . .      | —   | 9              | $6\frac{1}{2}$ | —              | 0 $0\frac{1}{4}$ W     |  |
| Spanish . .  | Doubloon          | —   | 17             | $8\frac{1}{2}$ | —              | 1 $0\frac{1}{2}$ W     |  |



| Country. | Names. | dwt    | gr                 | C      | gr                |         |
|----------|--------|--------|--------------------|--------|-------------------|---------|
| American | Eagle  | Weight | 11 6               | Report | 0 0 $\frac{1}{2}$ | Worse.  |
| Calcutta | Mohur  | —      | 8 12 $\frac{3}{4}$ | —      | 0 0 $\frac{1}{4}$ | W       |
| Madras   | Mohur  | —      | 7 12               | —      | 0 0 $\frac{1}{4}$ | W       |
| Bombay   | Mohur  | —      | 7 11               | —      | 0 0 $\frac{1}{4}$ | Better. |

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PRODUCTS.

|                   |           |                   |              |               |
|-------------------|-----------|-------------------|--------------|---------------|
| Ex. 1. Worseness, | lb        | 1 4 4 13          | Standard Oz. | 126 11 11     |
| 2. Betterness,    | lb        | 0 3 18 4          | Oz.          | 200 9 16      |
| 3. Betterness,    | Grs       | 3.35              | Dwts         | 8 8.10grs.    |
| 4. Betterness,    | Grs       | 4.73              | Dwts         | 2 10.48grs.   |
| 5. Fine Wt. Oz.   | 105 7 16  | Ex. 6. F. Wt. dw. | 4 21.45grs.  |               |
| 7. Value          | £ 204 6 8 | 8. Value          | £ 934 18 0   |               |
| 9.                | dwt       | gr                | grs          | s d           |
| Napoleon St. Wt.  | 4         | 1.52              | Fine 89.39   | Value 15 9.86 |
| Double Louis      | — 9       | 15.97             | — 212.64     | — 37 7.63     |
| Ducat             | — 2       | 9.56              | — 52.77      | — 9 4.07      |
| 10 Florins        | — 4       | 5.68              | — 93.21      | — 16 5.97     |
| George d'or       | — 4       | 5.04              | — 92.62      | — 16 4.72     |
| Christian d'or    | — 4       | 5.83              | — 93.34      | — 16 6.25     |
| Half-Sover.       | — 3       | 13.75             | — 78.61      | — 13 10.95    |
| Ducat             | — 2       | 10.00             | — 53.17      | — 9 4.93      |
| Half-Imperial     | — 4       | 3.50              | — 91.20      | — 16 1.71     |
| Max d'or          | — 3       | 11.80             | — 76.82      | — 13 7.16     |
| Dobraon           | — 34      | 12.00             | — 759.00     | — 134 4.01    |
| Joannese          | — 9       | 5.86              | — 203.37     | — 35 11.95    |
| Doubloon          | — 16      | 11.20             | — 362.26     | — 64 1.40     |
| Eagle             | — 11      | 4.46              | — 246.09     | — 43 6.67     |
| C. Mohur          | — 8       | 12.16             | — 187.15     | — 33 1.49     |
| M. Mohur          | — 7       | 11.48             | — 164.53     | — 29 1.44     |
| B. Mohur          | — 7       | 11.50             | — 164.54     | — 29 1.48     |

**TO FIND THE STANDARD WEIGHT OF SILVER.**

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Multiply the full weight by the number of Pennyweights in the report, and divide the product by 222 for the Betterness or Worseness.

Or divide the full weight by 37 for the Betterness or Worseness at 6 Dwts, and proportion this result to the given report.

Then add the Betterness or subtract the Worseness to or from the full weight.

N. B. The full weight of Silver in large quantities, is not taken lower than to quarters of an Ounce.—The standard weight is calculated to 1 Dwt.

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**EXAMPLE.**

To reduce 17 lb 10 oz. 15 dwts of Silver, reported Worse  $8\frac{1}{2}$  Dwts, to standard weight.

|               |     |         |                 |          |              |
|---------------|-----|---------|-----------------|----------|--------------|
|               |     | lb      | oz              | dw       |              |
| $\frac{1}{2}$ | - - | 17      | 10              | 15       |              |
|               |     |         |                 | 8        |              |
|               |     |         |                 |          |              |
|               |     | 143     | 2               | 0        |              |
|               |     | 8       | 11              | 7        |              |
|               |     |         |                 |          |              |
|               |     | 152     | 1               | 7        |              |
|               |     |         |                 |          |              |
| 222           | )   | 1825    | ( 8 oz. 4 dwts. |          |              |
|               |     | 49      |                 |          |              |
|               |     |         |                 |          |              |
|               | )   | 987     | ( 4 dwts.       |          |              |
|               |     | 99      |                 |          |              |
|               |     |         |                 |          |              |
|               |     | lb      | oz              | dw       |              |
|               |     | 17      | 10              | 15       | Full Weight. |
|               |     |         | 8               | 4        | Worseness.   |
|               |     |         |                 |          |              |
|               |     | 17      | 2               | 11       | Standard.    |
|               |     |         |                 |          |              |
|               |     | Oz. 206 |                 | 11 dwts. |              |
|               |     |         |                 |          |              |

**TO REDUCE THE FULL WEIGHT OF SILVER TO THE FINE WEIGHT.**

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Multiply the full weight by the number of Pennyweights fine, taken from the report, and divide the product by 240.

Or, take parts for the Pennyweights of alloy out of 240 Dwts, and subtract the amount.

Or, having found the standard weight, multiply it by 37, and divide the product by 40.

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**EXAMPLE.**

To find the quantity of fine Silver, in 39 oz. 10 dwts of Silver, reported Worse 6 Dwts.

$$222 \text{ dwts fine, less 6 dwts Worse} = 216 \text{ dwts fine.}$$

$$\text{Hence the Alloy} = 24 \text{ dwts.}$$

|                |    |                                           |                    |
|----------------|----|-------------------------------------------|--------------------|
|                | oz | dw                                        |                    |
| $\frac{1}{10}$ | -  | -                                         | 39 10 Full Weight. |
|                |    | 3 19                                      | Alloy for 24 dwts  |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                    |
| Oz.            | 35 | 11                                        | Fine Weight.       |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                    |

The Alloy being here 24 dwts, or the 10 th part of 240 dwts, one tenth of the full weight is taken off, and the remainder is the fine weight.

( or, )

|                |    |                                           |                                  |
|----------------|----|-------------------------------------------|----------------------------------|
|                | oz | dw                                        |                                  |
| $\frac{1}{37}$ | -  | -                                         | 39 10 at 6 dwts Worse.           |
|                |    | 1 1                                       | Worseness.                       |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                                  |
| $\frac{1}{20}$ | -  | -                                         | 38 9 Standard Weight.            |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                                  |
| $\frac{1}{2}$  | -  | -                                         | 1 18 $\frac{1}{2}$ for 2-40 ths. |
|                |    | 19 $\frac{1}{4}$                          | 1-40 th.                         |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                                  |
| Oz.            | 35 | 11                                        | Fine Weight.                     |
|                |    | <hr style="width: 50%; margin: 0 auto;"/> |                                  |

**TO FIND THE VALUE OF SILVER.**

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The Mint price of standard Silver at 66 d per Oz. is so much above the value that standard Silver has for many years borne, that it rarely is valued otherwise than as Bullion.

Dollars are usually sold by the full weight, at a variable price per Ounce.

Other Silver is sold by the standard weight, at a variable price per Ounce Standard.

But Coins are usually valued from the standard weight, at the fixed price of 5 s per Ounce Standard.

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**EXAMPLE 1.**

What is the value of 128 lb 11 oz. 15 dwts of Dollar Silver, at  $57\frac{7}{8}$  d per Ounce ?

$$128 \text{ lb } 11 \text{ oz. } 15 \text{ dwts} = 1547 \text{ oz. } 15 \text{ dwts.}$$

|                    | £                                         | s  | d               |                   |
|--------------------|-------------------------------------------|----|-----------------|-------------------|
| $\frac{1}{5}$ - -  | 1547                                      | 15 | 0               | Amount at 20 s    |
|                    | <hr style="width: 50%; margin: 0 auto;"/> |    |                 |                   |
| $\frac{1}{8}$ - -  | 309                                       | 11 | 0               | — 48 d            |
| $\frac{1}{12}$ - - | 38                                        | 13 | $10\frac{1}{2}$ | — 6 -             |
| $\frac{1}{4}$ - -  | 19                                        | 6  | $11\frac{1}{4}$ | — 3 -             |
| $\frac{1}{6}$ - -  | 4                                         | 16 | 9               | — $\frac{6}{8}$ - |
|                    |                                           | 16 | $1\frac{1}{2}$  | — $\frac{1}{8}$ - |
|                    | <hr style="width: 50%; margin: 0 auto;"/> |    |                 |                   |
|                    | £ 373                                     | 4  | 8               | Sterling.         |
|                    | <hr style="width: 50%; margin: 0 auto;"/> |    |                 |                   |

In the above manner also the valuation is made when the price is per Ounce Standard, after the full weight has been reduced to the standard weight, in the manner of the example page 144.

The valuation at 20 s per Oz. has been explained, page 139.

At 5 s per Oz. 1 Dwt is worth 3 d, and 1 Grain is worth  $\frac{1}{8}$  th of a Penny, and therefore  $\frac{1}{8}$  th of the number of standard Grains is the value in Pence.

## EXAMPLE 2.

To find the standard and fine weights, and the value at 5 s per Oz. Standard, of a Mexican Dollar weighing 17 dwts 8 grs. reported Worse 8 Dwts.

$$17 \text{ dwts } 8 \text{ grs} = 416 \text{ Grains.}$$

$$\begin{array}{r} \text{gr} \\ \frac{1}{3} - - 416 \quad \text{for 6 dwts.} \\ 138.666 \quad - 2 \text{ dwts.} \\ \hline \end{array}$$

$$37 \text{ ) } 554.666 \text{ ( } 14.990 \\ \quad \quad 36 \text{ remainder.}$$

$$\begin{array}{r} \text{gr} \\ 416 \quad \text{Full Weight.} \\ 14.990 \quad \text{Worseness.} \\ \hline \frac{1}{20} - - 401.010 \quad \text{Standard.} \\ \hline \frac{1}{2} - - 20.050 \\ 10.025 \\ \hline \text{Grains } 370.935 \quad \text{Fine.} \\ \hline \end{array}$$

$$\begin{array}{r} \text{d} \\ 8 \text{ ) } 401.01 \\ \hline \text{Pence } 50\frac{1}{8} \quad \text{Value.} \\ \hline \end{array}$$

Products — Standard Weight, grs 401.01 = 16 dwts. 17.01 grs.

Fine Weight — 370.93 Grains — Value  $50\frac{1}{8}$  d.

N. B. In the valuation of Coins, the remainders may be extended as directed in page 141.

The amount at 5 s per Oz. Standard is, as before stated, 1-8 th of a Penny for each Grain in the Standard Weight.

## EXERCISES.

Ex. 1. Find the standard weight in Oz. of a bar of Silver weighing lb 61 4 15, reported Better  $6\frac{1}{2}$  Dwts.

2. Find the standard weight in Oz. of a bar of Silver weighing lb. 27 10 10, reported Worse 1 Oz. 17 Dwts.

3. Find the fine weight of Oz. 87 5 Dwts of Silver, Worse,  $7\frac{1}{2}$  Dwts.

4. Find the average full, standard, and fine weights of a Spanish Dollar, from the estimate of 1000 Dollars weighing Oz. 866, the assay report being Worse 8 Dwts; and also find the value at  $59\frac{3}{4}$  d per Oz. Standard.

5. Find the standard and fine weights, and the value at 5 s per Oz. Standard of each of the following Coins.

| Country.     | Names.          |        | dwt | gr              | Report | oz        | dw             |         |
|--------------|-----------------|--------|-----|-----------------|--------|-----------|----------------|---------|
| French . .   | 5 Francs        | Weight | 16  | $1\frac{3}{4}$  | Report | 0         | 7              | Worse.  |
| Dutch . .    | Guilder or Flo. | —      | 6   | 22              | —      | 0         | 8              | W       |
| Hanoverian   | F. Zweydrittel  | —      | 8   | 9               | —      | 0         | 16             | Better. |
| Hamburg .    | Current Mark    | —      | 5   | $21\frac{1}{2}$ | —      | 2         | 2              | W       |
| Danish . .   | Rigsbank Doll.  | —      | 9   | 7               | —      | 0         | 12             | W       |
| Prussian .   | Current Dollar  | —      | 14  | 7               | —      | 2         | 3              | W       |
| Russian . .  | Silver Ruble    | —      | 13  | 8               | —      | 0         | 14             | W       |
| Austrian .   | Speciesthaler   | —      | 18  | 1               | —      | 1         | 2              | W       |
| L. Veneto    | 6 Lire          | —      | 16  | $17\frac{1}{2}$ | —      | 0         | 7              | W       |
| Neapolitan   | Ducat del Reg.  | —      | 14  | 18              | —      | 1         | 2              | W       |
| Sicilian . . | Crown 12 Tari   | —      | 17  | 14              | —      | 1         | 4              | W       |
| Roman . .    | Scudo           | —      | 17  | 1               | —      | 0         | 3              | W       |
| Portuguese   | Crusado Novo    | —      | 9   | 3               | —      | 0         | 4              | W       |
| Spanish . .  | Pillar Dollar   | —      | 17  | 8               | —      | 0         | 8              | W       |
| Mexican .    | Dollar          | —      | 17  | $7\frac{3}{4}$  | —      | 0         | $7\frac{1}{2}$ | W       |
| Peruvian .   | Dollar          | —      | 17  | 7               | —      | 0         | $6\frac{1}{2}$ | W       |
| American .   | Dollar          | —      | 17  | 8               | —      | 0         | $8\frac{1}{2}$ | W       |
| Bengal . .   | Sicca Rupee     | —      | 8   | 0               | —      | Standard. |                |         |
| Madras .     | Rupee           | —      | 7   | 12              | —      | 0         | 2              | W       |
| Bombay .     | Rupee           | —      | 7   | 11              | —      | 0         | $0\frac{1}{4}$ | W       |

## PRODUCTS.

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- Ex. 1. Betterness 1 lb 9 oz. 11 dwts; Stand. oz. 758 6 dwts.  
 2. Worseness, 4 lb 7 oz. 15 dwts — oz. 278 15 dwts.  
 3. Fine Weight 78 oz. 0 dwts  
 4. Average Weight dwts 17 7.68 grs.  
 Standard Weight dwts 16 16.69 grs.  
 Fine Wt 370.64 grs —Value 49.87 Pence.

5.		dw	gr	grs		s	d
5 Francs	St. Wt.	15	13.58	Fine 345.56	Value	3	10.69
Florin	—	6	16.01	— 148.01	—	1	8.00
Zweydrittel	—	8	23.48	— 199.32	—	2	2.93
Current Mark	—	4	18.73	— 106.12	—	1	2.34
Rigsb. Dollar	—	8	18.94	— 195.12	—	2	2.36
Prussian Doll.	—	11	12.56	— 255.82	—	2	10.57
Silver Ruble	—	12	11.82	— 277.33	—	3	1.47
Speiesthaler	—	16	6.09	— 360.83	—	4	0.76
6 Lire	—	16	4.84	— 359.67	—	4	0.60
Ducat del Reg.	—	13	6.91	— 295.00	—	3	3.86
Sicilian Crown	—	15	16.37	— 348.15	—	3	11.04
Roman Scudo	—	16	19.47	— 373.21	—	4	2.43
Crusado Novo	—	8	23.05	— 198.92	—	2	2.88
Pillar Dollar	—	16	17.01	— 370.93	—	4	2.12
Mexican Doll.	—	16	17.70	— 371.57	—	4	2.21
Peruvian Doll.	—	16	18.85	— 372.63	—	4	2.35
Amer. Dollar	—	16	16.07	— 370.06	—	4	2.00
Sicca Rupee	—	8	0.00	— 177.60	—	2	0.00
Madras Rupee	—	7	10.37	— 165.00	—	1	10.29
Bomb. Rupee	—	7	10.79	— 165.39	—	1	10.34

**TO FIND THE VALUE OF GOLD AND SILVER  
PARTINGS.**

---

Gold and Silver Partings are mixtures of these Metals with or without any Alloy ; the mixture being called a Gold Parting when the Gold is in greater quantity, and a Silver Parting when there is more Silver than Gold.

The report of a Gold Parting is made thus ;

Worse	—	2 Car 3 Grains.
Fine Silver	—	1 Oz. 17 Dwts.

Which means, that the mass, with regard to the quantity of the alloy, is 2 Carats 3 Grs worse than standard Gold ; and that out of the alloy, the weight of 1 oz. 17 dwts per Pound Troy of Metal, is fine Silver.

The report of a Silver Parting is made thus ;

Worse	—	0 Oz. 8 Dwts.
Fine Gold	—	10 Troy Grains

Meaning that the Metal, as a mixture of Silver, is 8 Dwts worse than standard Silver ; and that a Pound Troy of the Metal contains 10 Troy Grains of fine Gold.

The valuation of a Gold Parting is more commonly made by a rate agreed upon between the Purchaser and Seller, than by a separate valuation of each of the precious Metals ; but with a Silver Parting it is rather the reverse.

---

N. B. Sometimes the actual quantities of both Metals are reported, thus ;

Fine Gold	7 Oz.	}	in the Pound.
Fine Silver	3 Oz.		

Which, as a Gold Parting, is equivalent to, Worse 8 Carats ; fine Silver 3 Oz. in the Pound.



EXAMPLE 1.

To find the value per Oz. of a Gold Parting Ingot, reported

Worse — 2 Carats 3 Grains.  
 Fine Silver — 1 Oz. 17 Dwts per lb.

reckoning standard Gold to be worth 77 s 6 d per Oz. and standard Silver 5 s per Oz. and the expense of refining to be 8 d per Oz.

	s	d	
$\frac{1}{11}$ - -	77	6	Price per Oz. Standard.
$\frac{1}{4}$ - -	7	$0\frac{1}{2}$	for 2 Carats.
$\frac{1}{2}$ - -	1	9	— 2 Grs.
		$10\frac{1}{2}$	— 1 Gr.
	9	8	Allowance for Worseness.
	67	10	Value of the Gold per Oz.
Silver	s	d	
	5	0	Stand.
3.37 lbs		5	Alloy.
1 oz. . . .	5	5	Fine.
10 dwts . .	2	$8\frac{1}{2}$	
5 — . . .	1	$4\frac{1}{4}$	
2 — . . .		$6\frac{1}{2}$	
s 10	$0\frac{1}{2}$	- -	10
			Add for fine Silver.
	68	8	Value per Oz.
		8	Allowance for refining.
Net Value	s 68	0	per Oz.

The allowance for the Worseness upon the value per Oz. Standard having been made, we have to make an addition for the fine Silver, at 5 s 5 d per Oz. for 1 Oz. 17 Dwts—but as the latter quantity is contained in 1 lb of Metal, we take 1-12 th of the amount, as the additional value per Ounce for the fine Silver.

## EXAMPLE 2.

To find the rate per Oz. of Silver Parting, reported

Worse — 8 Dwts.

Fine Gold — 15 Troy Grs per lb.

reckoning standard Silver to be worth 5 s per Oz. and fine Gold 84 s 6 d per Oz.; and allowing  $1\frac{3}{4}$  d per Oz. for the expense of refining.

	s	d	
	5	0	
	<hr/>		
1-37 th	-	-	1.62 for 6 Dwts.
		.54	— 2 —
	<hr/>		
		2.16	Allowance for Worseness.
	<hr/>		
	s	d	
1 Oz.	84	6	
	<hr/>		
1 Dw.	4	2.7	
	<hr/>		
12 Grs	2	1.35	
3 Grs	.	6.33	
	<hr/>		
2	7.68 per lb	2.64	Add for fine Gold.
	<hr/>		
	s	5	0.48 Value per Oz.
		1.75	Allowance for refining.
	<hr/>		
	s	4	10.73 d or 4 s 10 $\frac{3}{4}$ d per Oz.

The accuracy of this mode of calculation depends upon the manner in which the Assayer makes his report.—If the report of the purity of the Silver is made after the Gold has been extracted, this estimation is correct; but if the Gold is considered as alloy to the Silver, and the report of the latter is made before the quantity of Gold is found, then the Silver report requires, as a correction, to be lessened in purity by the amount of the Gold: as 15 Grains of Gold upon the report, Worse 8 Dwts, will make the report Worse 9 Dwts, unless the report is made in quarter-pennyweights, and then the allowance will make the report Worse  $8\frac{3}{4}$  Dwts.

EXAMPLE OF THE VALUATION OF SILVER PARTING.

Bars.	Weight.		Report.	
	lb oz dw			gr.
No. 1 —	31 10 15	Worse 6½ Dwts	Fine Gold 17	per lb.
2 —	38 3 0	Worse 8 Dwts	do. 11	—
3 —	36 9 10	Worse 3 Dwts	do. 35	—
4 —	30 8 10	Better 5 Dwts	do. 22	—
Silver 59¾ d per Oz. Stand. — Gold 77 s 9 d per Oz. Stand.				
Allowance for refining, 1 s 9 d per lb.				

No.	Weight.		Weight.		gr.
	lb oz dw		lb oz dw		
No. 1 —	31 10 15	Worseness	0 11 4	Fine Gold	542
2 —	38 3 0	—	1 4 10	—	421
3 —	36 9 10	—	1 3 18	—	1287
	<u>106 11 5</u>		<u>3 7 12</u>		
4 —	30 8 10	Betterness	8 6	—	675
	<u>137 7 15</u>		<u>2 11 6</u>	Grains	2925
	<u>2 11 6</u>	Net Worseness		Oz.	6 1 21
lb	<u>134 8 9</u>	Standard			
Oz.	<u>1616 9 dwts</u>	-	at 59¾ d	-	£ 402 8 7

	oz dw gr			
Fine Gold	6 1 21			
Betterness	10 17	at 1 Car. 3¾ Gr.		
			£ s d	
Stand.	6 12 14	at 77 s 9 d	- - 25 15 5	
Extracting	137 lb 7 oz.	at 1 s 9 d	- - 12 0 9	- 13 14 8
				<u>£ 416 3 3</u>

N. B. Fine Gold is here reckoned only 1 Car. 3¾ Grs. Better, it being difficult to extract Gold, in any large quantity, free from some alloy.

Sometimes instead of allowing the charge for extracting, 8 or 9 Grains are deducted from the report, and the surplus is valued either from the Standard Weight, or at 2 pence per fine Grain.

## FRENCH REPORTS.

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The French mode of reporting Gold and Silver, is, according to the decimal system, to report the whole of the fine metal, in *Millièmes* or 1000 th parts of the metal under trial.

Hence as the English lowest division for Gold is into Quarter-Grains, or the 24 Carats into 384 Quarter-Grains, and for Silver into Half-Dwts, or the 12 Oz. into 480 Half-Dwts, the French reports are finer, or to a greater degree of accuracy, than the English

by 1000 to 384, or about  $2\frac{1}{2}$  to 1, for Gold;\* and  
by 1000 to 480, or about 2 to 1, for Silver.

The reduction of these decimal reports to the British Standards, is made in the manner of the following Examples.

---

### EXAMPLE 1.

To reduce the French report of 987 *Millièmes* fine to an English report in Carats.

	.987			
	24			
	<hr style="width: 50%; margin: 0 auto;"/>			
Car.	23.688			
	.4			
	<hr style="width: 50%; margin: 0 auto;"/>			
Gr.	2.752			
	<hr style="width: 50%; margin: 0 auto;"/>			
Report 987 Fine =	Carats	23	$\frac{23}{4}$	Gr.
British Standard	- -	22	0	
			<hr style="width: 50%; margin: 0 auto;"/>	
Better —	Carats	1	$\frac{23}{4}$	Gr.
			<hr style="width: 50%; margin: 0 auto;"/>	

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\* If the Gold is reported to half-quarter-grains, as is sometimes done, and as it has lately been proposed at the Mint to be generally done, the 24 Carats are then divided into 768 eighths of grains, and the relation between the French and English reports becomes as 1000 to 768.

## REVERSE.

To reduce 1 Carat  $2\frac{3}{4}$  Grs Better into Millièmes.

1 Car.  $2\frac{3}{4}$  Grs Better, are 23 Car.  $2\frac{3}{4}$  Grs fine.

4	)	2.75	
24	)	23.6875	
6	)	5.9218	
Millièmes		987	Raide*

~~~~~

## EXAMPLE 2.

To reduce British Standard for Gold, or 22 Carats fine, into Millièmes.

|           |   |        |  |
|-----------|---|--------|--|
| 2         | ) | 22.    |  |
|           |   |        |  |
| 12        | ) | 11.000 |  |
|           |   |        |  |
| Millièmes |   | 917    |  |

It must be remarked, that there is a little diversity in the practice of French calculators, with respect to reckoning the lowest figure of the Millièmes when there is a remainder that is above half the divisor; thus some reckon British Standard Gold, which is  $916\frac{2}{3}$  fine, as 917 fine; others as 916 fine; and others extend the decimal thus, 916.66, &c.

It may be noticed, that the French assayers are generally considered to make their reports of Gold about 2 Millièmes or  $\frac{1}{4}$  Grain worse than the reports of English assayers; thus the British Gold Coin is estimated at only 915 fine, and is received into the French mints only at this rate.

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\* When the French reports are made for the guidance of Merchants, it is customary, if the fineness is barely equal to the report, to style it *Raide*, and when it is the full Millième, or a little above, to character it as *Franc* or *Bien Franc*.

## EXAMPLE 3.

To reduce the French report of 938 of Silver, to the equivalent English report, in Ounces and Dwts.

|      |        |          |         |       |
|------|--------|----------|---------|-------|
|      | .938   |          |         |       |
|      | 12     |          |         |       |
|      | -----  |          |         |       |
| Oz.  | 11.256 | Report   | oz. dw. | Fine. |
|      | 20     | Standard | 11 2    |       |
|      | -----  |          |         |       |
| Dwts | 5.120  | Better   | — 3     | Dwts. |
|      |        |          | -----   |       |

The number of Dwts fine that answer to the Silver report in Millièmes, may be found by dividing them by 4, and subtracting from the quotient 1 Dwt out of every 25, or 4 out of 100— Thus 938 divided by 4 gives  $234\frac{1}{2}$ , from which taking  $9\frac{1}{2}$  (8 for 200 and  $1\frac{1}{2}$  for 34) there remains, as above, 225 Dwts fine.

## EXAMPLE 4.

To reduce the English report of Silver, Worse 7 Dwts, into Millièmes.

Worse 7 dwts, is Fine 10 oz. 15 dwts = 10.75 oz.

|           |             |              |
|-----------|-------------|--------------|
|           | 12 ) 10.750 |              |
|           | -----       |              |
| Millièmes | 896         | <i>Raide</i> |
|           | -----       |              |

## EXAMPLE 5.

To reduce the English report for Silver of Standard fineness, into Millièmes.

Standard is 11 oz. 2 dwts fine.

|           |             |
|-----------|-------------|
|           | 12 ) 11.100 |
|           | -----       |
| Millièmes | 925         |
|           | -----       |

In French Parting Reports, 1 Millième of Gold is about  $5\frac{3}{4}$  Grains in the English Pound Troy; but the Gold should be reported 6 Grains at least, to make the full Millième.

## THE FRENCH MINTAGE VALUATION OF GOLD AND SILVER.

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The standard purity of the French Coins both Gold and Silver is 900 fine.—The fixed full price for Gold of this purity, is Francs 3100 per Kilogramme, and for Silver, Francs 200 per Kilogramme; but as the French Mints charge 9 Francs per Kilogramme of Gold of the purity of 900 fine, or 10 Francs per Kilogramme of fine Gold, and  $1\frac{1}{2}$  per Cent on Silver, for Seignorage, *Retinue*, or Mint expenses, the fixed prices become

|        |                       |            |     |      |                             |
|--------|-----------------------|------------|-----|------|-----------------------------|
| Francs | 3091.00               | for Gold   | - - | 900  | fine, or                    |
| —      | 3434.44 $\frac{1}{2}$ | ditto      | - - | 1000 | fine, that is, fine Gold.   |
| —      | 197.00                | for Silver | - - | 900  | fine, or                    |
| —      | 288.88 $\frac{8}{9}$  | ditto      | - - | 1000 | fine, that is, fine Silver. |

From these the prices for any other purities are obtained, by multiplying them by the Millièmes of purity, and dividing the results by 900 if the prices for this purity be used.

The fixed prices thus obtained are called Tarif Rates, and any variation in the market-price is formed by an agio, which has hitherto always been a premium.\*

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### EXAMPLES OF FORMING THE TARIF RATES.

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For Gold 916 fine.

$$\begin{aligned} & \text{Francs } 3434.44\frac{1}{2} \quad \times \quad 916 = \text{Francs } 3145.95 \\ \text{or, Francs } 3091 & \times 916 \div 900 = \text{Francs } 3145.95 \end{aligned}$$

For Silver 925 fine.

$$\begin{aligned} & \text{Francs } 218.89 \quad \times \quad 925 = \text{Francs } 202.47 \\ \text{or, Francs } 197 & \times 925 \div 900 = \text{Francs } 202.47 \end{aligned}$$

In forming the Tarif Rates it is to be observed, that the second of each of the above methods is generally used; and that in dividing by 9, if 5 or above remains, it makes the rate another Centime; thus 218.88 $\frac{8}{9}$  is reckoned 218.89 Francs.

---

\* Gold and Silver Partings are termed Or argenté and Argent doré.—The two metals in the former are usually separately valued; but with the latter 1 Millième is generally deducted from the report of the fine Gold, and the value of the Gold is estimated for the remainder.—With respect to the value of the Millième deducted, part covers the expense of refining, and the other part raises the rate of the premium.

## EXAMPLES OF THE VALUATION OF GOLD AND SILVER.

### EXAMPLE 1.

To find the amount of Kilogrammes 3.071 of Gold, 978 fine, at a premium of  $8\frac{1}{2}$  per Mille upon the Tarif Rate of 3358.89 Francs per Kilogramme.

|        |                                                               |                                                               |                         |
|--------|---------------------------------------------------------------|---------------------------------------------------------------|-------------------------|
|        | Francs                                                        |                                                               |                         |
|        | 3358.89                                                       |                                                               |                         |
|        | 3,071                                                         |                                                               |                         |
|        | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                                                               |                         |
|        | 335889                                                        |                                                               |                         |
|        | 2351223                                                       |                                                               |                         |
|        | 1007667                                                       |                                                               |                         |
|        | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                                                               |                         |
|        | Francs                                                        | 10315.15                                                      | Amount without Premium. |
| 10.315 | $\times 8 =$                                                  | 82.52                                                         | Premium at 8 per Mille. |
| —      | $\times \frac{1}{2} =$                                        | 5.16                                                          | — — $\frac{1}{2}$ —     |
|        |                                                               | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                         |
|        | Francs                                                        | 10402.83                                                      | Whole amount.           |
|        |                                                               | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                         |

Instead of thus valuing the Gold from the Tarif Rate and the quantity, which is the proper method, it is by some directed that the price of the Kilogramme fine, should be multiplied by the number of Kilogrammes, and that product by the purity, but when the quantity is large the two results will frequently not agree by several Centimes.

### EXAMPLE 2.

To find the amount of Kilogrammes 18.084 of Silver, 896 fine at the premium of 4 per Mille upon the Tarif Rate of 196.12 Francs per Kilogramme.

|            |          |        |   |                                                               |          |
|------------|----------|--------|---|---------------------------------------------------------------|----------|
| Frs 196.12 | $\times$ | 18.084 | = | Frs 3546 63                                                   | Cents.   |
| 3.5466     | $\times$ | 4      | = | 14 19                                                         | Premium. |
|            |          |        |   | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |          |
|            |          |        |   | Francs                                                        | 3560 82  |
|            |          |        |   |                                                               | Amount.  |
|            |          |        |   | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |          |



## EXERCISES.

Ex. 1. Compare the following decimal reports with British Standard.

|          |          |            |            |
|----------|----------|------------|------------|
| Gold 892 | Gold 917 | Silver 788 | Silver 925 |
| — 898    | — 925    | — 892      | — 930      |
| — 900    | — 995    | — 900      | — 986      |

2. Reduce the following English reports to Millièmes fine.

|             |              |              |               |
|-------------|--------------|--------------|---------------|
| Gold Car. 1 | 2½ Gr. Worse | Silver Oz. 1 | 2 Dwts Worse. |
| — — 0       | 0¼ — Worse   | — — 0        | 8 — Worse.    |
| — — 1       | 2½ — Better  | — — 0        | 14 — Better.  |

3. Find the Tarif Rates and values of the following quantities of Gold at 7 per Mille premium.

|                    |            |       |
|--------------------|------------|-------|
| Kilogrammes 14.846 | Report 996 | fine. |
| — 11.338           | — 944      | fine. |
| — 16.725           | — 915      | fine. |

4. Find the Tarif Rates and the values of the following quantities of Silver at 5½ per Mille premium.

|                    |            |       |
|--------------------|------------|-------|
| Kilogrammes 22.894 | Report 988 | fine. |
| — 23.679           | — 963      | fine. |
| — 17.498           | — 907      | fine. |

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 PRODUCTS.

Ex. 1. Worse 0 C. 2⅜ Gr. W. 0 C. 1⅞ Gr. W. 0 C. 1⅝ Gr.  
 Standard B. 0 C. 0⅜ Gr. B. 1 C. 3½ Gr.  
 Worse 1 Oz. 13 Dw. W. 0 Oz. 8 Dw. W. 0 Oz. 6 Dw.  
 Standard B. 0 Oz. 1 Dw. B. 0 Oz. 14½ Dw.

|          |                      |        |                  |
|----------|----------------------|--------|------------------|
| 2.       | £48.9                | 914.0  | 984.3            |
|          | 833.3                | 891.6  | 983.3            |
| 3. Rate, | Francs £420.71       | Value, | Francs 50783.86  |
|          | 3242.12              |        | 36759.16         |
|          | 3142.52              |        | 52558.65         |
|          | Amount with Premium, |        | Francs 141082.38 |
| 4. Rate, | Francs 216.26        | Value, | Francs 4951.06   |
|          | 210.79               |        | 4991.30          |
|          | 198.53               |        | 3473.88          |
|          | Amount with Premium, |        | Francs 13493.38  |

TARIF RATES AND BRITISH REPORTS FOR MILLIEMES  
OF GOLD.

| Mill. | Fr.  | C. | C. | gr. | Mill.          | Fr. | C.   | C. | gr. |   |
|-------|------|----|----|-----|----------------|-----|------|----|-----|---|
| 1000  | 3434 | 44 | B  | 2   | 0              | 953 | 3273 | 03 | B   | 0 |
| 999   | 3431 | 01 |    | 1   | $3\frac{7}{8}$ | 952 | 3269 | 59 |     | 0 |
| 998   | 3427 | 58 |    | 1   | $3\frac{3}{4}$ | 951 | 3266 | 16 |     | 0 |
| 997   | 3424 | 14 |    | 1   | $3\frac{5}{8}$ | 950 | 3262 | 72 |     | 0 |
| 996   | 3420 | 71 |    | 1   | $3\frac{1}{2}$ | 949 | 3259 | 29 |     | 0 |
| 995   | 3417 | 27 |    | 1   | $3\frac{1}{2}$ | 948 | 3255 | 85 |     | 0 |
| 994   | 3413 | 84 |    | 1   | $3\frac{3}{8}$ | 947 | 3252 | 42 |     | 0 |
| 993   | 3410 | 40 |    | 1   | $3\frac{1}{4}$ | 946 | 3248 | 98 |     | 0 |
| 992   | 3406 | 97 |    | 1   | $3\frac{1}{8}$ | 945 | 3245 | 55 |     | 0 |
| 991   | 3403 | 53 |    | 1   | $3\frac{1}{8}$ | 944 | 3242 | 12 |     | 0 |
| 990   | 3400 | 10 |    | 1   | 3              | 943 | 3238 | 68 |     | 0 |
| 989   | 3396 | 67 |    | 1   | $2\frac{7}{8}$ | 942 | 3235 | 25 |     | 0 |
| 988   | 3393 | 23 |    | 1   | $2\frac{3}{4}$ | 941 | 3231 | 81 |     | 0 |
| 987   | 3389 | 80 |    | 1   | $2\frac{3}{4}$ | 940 | 3228 | 38 |     | 0 |
| 986   | 3386 | 36 |    | 1   | $2\frac{5}{8}$ | 939 | 3224 | 94 |     | 0 |
| 985   | 3382 | 93 |    | 1   | $2\frac{1}{2}$ | 938 | 3221 | 51 |     | 0 |
| 984   | 3379 | 49 |    | 1   | $2\frac{3}{8}$ | 937 | 3218 | 07 |     | 0 |
| 983   | 3376 | 06 |    | 1   | $2\frac{1}{4}$ | 936 | 3214 | 64 |     | 0 |
| 982   | 3372 | 62 |    | 1   | $2\frac{1}{4}$ | 935 | 3211 | 21 |     | 0 |
| 981   | 3369 | 19 |    | 1   | $2\frac{1}{8}$ | 934 | 3207 | 77 |     | 0 |
| 980   | 3365 | 76 |    | 1   | 2              | 933 | 3204 | 34 |     | 0 |
| 979   | 3362 | 32 |    | 1   | $1\frac{7}{8}$ | 932 | 3200 | 90 |     | 0 |
| 978   | 3358 | 89 |    | 1   | $1\frac{7}{8}$ | 931 | 3197 | 47 |     | 0 |
| 977   | 3355 | 45 |    | 1   | $1\frac{3}{4}$ | 930 | 3194 | 03 |     | 0 |
| 976   | 3352 | 02 |    | 1   | $1\frac{5}{8}$ | 929 | 3190 | 60 |     | 0 |
| 975   | 3348 | 58 |    | 1   | $1\frac{5}{8}$ | 928 | 3187 | 16 |     | 0 |
| 974   | 3345 | 15 |    | 1   | $1\frac{5}{8}$ | 927 | 3183 | 73 |     | 0 |
| 973   | 3341 | 71 |    | 1   | $1\frac{3}{8}$ | 926 | 3180 | 30 |     | 0 |
| 972   | 3338 | 28 |    | 1   | $1\frac{1}{4}$ | 925 | 3176 | 86 |     | 0 |
| 971   | 3334 | 85 |    | 1   | $1\frac{1}{8}$ | 924 | 3173 | 43 |     | 0 |
| 970   | 3331 | 41 |    | 1   | 1              | 923 | 3169 | 99 |     | 0 |
| 969   | 3327 | 98 |    | 1   | 1              | 922 | 3166 | 56 |     | 0 |
| 968   | 3324 | 54 |    | 1   | $0\frac{7}{8}$ | 921 | 3163 | 12 |     | 0 |
| 967   | 3321 | 11 |    | 1   | $0\frac{3}{4}$ | 920 | 3159 | 69 |     | 0 |
| 966   | 3317 | 67 |    | 1   | $0\frac{5}{8}$ | 919 | 3156 | 25 |     | 0 |
| 965   | 3314 | 24 |    | 1   | $0\frac{5}{8}$ | 918 | 3152 | 82 |     | 0 |
| 964   | 3310 | 80 |    | 1   | $0\frac{1}{2}$ | 917 | 3149 | 39 | St  | 0 |
| 963   | 3307 | 37 |    | 1   | $0\frac{5}{8}$ | 916 | 3145 | 95 | W   | 0 |
| 962   | 3303 | 94 |    | 1   | $0\frac{1}{4}$ | 915 | 3142 | 52 |     | 0 |
| 961   | 3300 | 50 |    | 1   | $0\frac{1}{4}$ | 914 | 3139 | 08 |     | 0 |
| 960   | 3297 | 07 |    | 1   | $0\frac{1}{8}$ | 913 | 3135 | 65 |     | 0 |
| 959   | 3293 | 63 |    | 1   | 0              | 912 | 3132 | 21 |     | 0 |
| 958   | 3290 | 20 |    | 0   | $3\frac{7}{8}$ | 911 | 3128 | 78 |     | 0 |
| 957   | 3286 | 76 |    | 0   | $3\frac{3}{4}$ | 910 | 3125 | 34 |     | 0 |
| 956   | 3283 | 33 |    | 0   | $3\frac{3}{4}$ | 909 | 3121 | 91 |     | 0 |
| 955   | 3279 | 89 |    | 0   | $3\frac{5}{8}$ | 908 | 3118 | 48 |     | 0 |
| 954   | 3276 | 46 |    | 0   | $3\frac{1}{2}$ | 907 | 3115 | 04 |     | 0 |

TARIF RATES AND BRITISH REPORTS FOR MILLIEMES OF GOLD.

| Mill. | Fr.  | C. | C.  | gr.             | Mill. | Fr.  | C. | C.  | gr.             |
|-------|------|----|-----|-----------------|-------|------|----|-----|-----------------|
| 906   | 3111 | 61 | W 0 | 1 $\frac{1}{8}$ | 859   | 2950 | 19 | W 1 | 1 $\frac{5}{8}$ |
| 905   | 3108 | 17 | 0   | 1 $\frac{1}{8}$ | 858   | 2946 | 75 | 1   | 1 $\frac{3}{4}$ |
| 904   | 3104 | 74 | 0   | 1 $\frac{1}{4}$ | 857   | 2943 | 32 | 1   | 1 $\frac{3}{4}$ |
| 903   | 3101 | 30 | 0   | 1 $\frac{3}{8}$ | 856   | 2939 | 88 | 1   | 1 $\frac{7}{8}$ |
| 902   | 3097 | 87 | 0   | 1 $\frac{5}{8}$ | 855   | 2936 | 45 | 1   | 2               |
| 901   | 3094 | 43 | 0   | 1 $\frac{5}{8}$ | 854   | 2933 | 02 | 1   | 2 $\frac{1}{8}$ |
| 900   | 3091 | 00 | 0   | 1 $\frac{5}{8}$ | 853   | 2929 | 58 | 1   | 2 $\frac{1}{8}$ |
| 899   | 3087 | 57 | 0   | 1 $\frac{3}{4}$ | 852   | 2926 | 15 | 1   | 2 $\frac{1}{4}$ |
| 898   | 3084 | 13 | 0   | 1 $\frac{7}{8}$ | 851   | 2922 | 71 | 1   | 2 $\frac{3}{8}$ |
| 897   | 3080 | 70 | 0   | 2               | 850   | 2919 | 28 | 1   | 2 $\frac{1}{2}$ |
| 896   | 3077 | 26 | 0   | 2               | 849   | 2915 | 84 | 1   | 2 $\frac{1}{2}$ |
| 895   | 3073 | 83 | 0   | 2 $\frac{1}{8}$ | 848   | 2912 | 41 | 1   | 2 $\frac{5}{8}$ |
| 894   | 3070 | 39 | 0   | 2 $\frac{1}{4}$ | 847   | 2908 | 97 | 1   | 2 $\frac{3}{4}$ |
| 893   | 3066 | 96 | 0   | 2 $\frac{3}{8}$ | 846   | 2905 | 54 | 1   | 2 $\frac{7}{8}$ |
| 892   | 3063 | 52 | 0   | 2 $\frac{3}{8}$ | 845   | 2902 | 11 | 1   | 3               |
| 891   | 3060 | 09 | 0   | 2 $\frac{1}{2}$ | 844   | 2898 | 67 | 1   | 3               |
| 890   | 3056 | 66 | 0   | 2 $\frac{5}{8}$ | 843   | 2895 | 24 | 1   | 3 $\frac{1}{8}$ |
| 889   | 3053 | 22 | 0   | 2 $\frac{3}{4}$ | 842   | 2891 | 80 | 1   | 3 $\frac{1}{4}$ |
| 888   | 3049 | 79 | 0   | 2 $\frac{7}{8}$ | 841   | 2888 | 37 | 1   | 3 $\frac{3}{8}$ |
| 887   | 3046 | 35 | 0   | 2 $\frac{7}{8}$ | 840   | 2884 | 93 | 1   | 3 $\frac{3}{8}$ |
| 886   | 3042 | 92 | 0   | 3               | 839   | 2881 | 50 | 1   | 3 $\frac{1}{2}$ |
| 885   | 3039 | 48 | 0   | 3 $\frac{1}{8}$ | 838   | 2878 | 06 | 1   | 3 $\frac{5}{8}$ |
| 884   | 3036 | 05 | 0   | 3 $\frac{1}{4}$ | 837   | 2874 | 63 | 1   | 3 $\frac{3}{4}$ |
| 883   | 3032 | 61 | 0   | 3 $\frac{1}{4}$ | 836   | 2871 | 20 | 1   | 3 $\frac{3}{4}$ |
| 882   | 3029 | 18 | 0   | 3 $\frac{3}{8}$ | 835   | 2867 | 76 | 1   | 3 $\frac{7}{8}$ |
| 881   | 3025 | 75 | 0   | 3 $\frac{1}{2}$ | 834   | 2864 | 33 | 2   | 0               |
| 880   | 3022 | 31 | 0   | 3 $\frac{5}{8}$ | 833   | 2860 | 29 | 2   | 0 $\frac{1}{8}$ |
| 879   | 3018 | 18 | 0   | 3 $\frac{5}{8}$ | 832   | 2857 | 46 | 2   | 0 $\frac{1}{4}$ |
| 878   | 3015 | 44 | 0   | 3 $\frac{3}{4}$ | 831   | 2854 | 62 | 2   | 0 $\frac{1}{4}$ |
| 877   | 3012 | 01 | 0   | 3 $\frac{7}{8}$ | 830   | 2850 | 59 | 2   | 0 $\frac{3}{8}$ |
| 876   | 3008 | 57 | 1   | 0               | 829   | 2847 | 15 | 2   | 0 $\frac{1}{2}$ |
| 875   | 3005 | 14 | 1   | 0               | 828   | 2843 | 72 | 2   | 0 $\frac{5}{8}$ |
| 874   | 3001 | 70 | 1   | 0 $\frac{1}{8}$ | 827   | 2840 | 29 | 2   | 0 $\frac{5}{8}$ |
| 873   | 2998 | 27 | 1   | 0 $\frac{1}{4}$ | 826   | 2836 | 85 | 2   | 0 $\frac{3}{4}$ |
| 872   | 2994 | 84 | 1   | 0 $\frac{3}{8}$ | 825   | 2833 | 42 | 2   | 0 $\frac{7}{8}$ |
| 871   | 2991 | 40 | 1   | 0 $\frac{1}{2}$ | 824   | 2829 | 98 | 2   | 1               |
| 870   | 2987 | 97 | 1   | 0 $\frac{1}{2}$ | 823   | 2826 | 55 | 2   | 1               |
| 869   | 2984 | 53 | 1   | 0 $\frac{5}{8}$ | 822   | 2823 | 11 | 2   | 1 $\frac{1}{8}$ |
| 868   | 2981 | 10 | 1   | 0 $\frac{3}{4}$ | 821   | 2819 | 68 | 2   | 1 $\frac{1}{4}$ |
| 867   | 2977 | 66 | 1   | 0 $\frac{7}{8}$ | 820   | 2816 | 24 | 2   | 1 $\frac{3}{8}$ |
| 866   | 2974 | 23 | 1   | 0 $\frac{7}{8}$ | 819   | 2812 | 81 | 2   | 1 $\frac{1}{2}$ |
| 865   | 2970 | 79 | 1   | 1               | 818   | 2809 | 38 | 2   | 1 $\frac{1}{2}$ |
| 864   | 2967 | 36 | 1   | 1 $\frac{1}{8}$ | 817   | 2805 | 94 | 2   | 1 $\frac{5}{8}$ |
| 863   | 2963 | 93 | 1   | 1 $\frac{1}{4}$ | 816   | 2802 | 51 | 2   | 1 $\frac{3}{4}$ |
| 862   | 2960 | 49 | 1   | 1 $\frac{1}{4}$ | 815   | 2799 | 07 | 2   | 1 $\frac{7}{8}$ |
| 861   | 2957 | 06 | 1   | 1 $\frac{3}{8}$ | 814   | 2795 | 64 | 2   | 1 $\frac{7}{8}$ |
| 860   | 2953 | 62 | 1   | 1 $\frac{1}{2}$ | 813   | 2792 | 20 | 2   | 2               |

TARIF RATES AND BRITISH REPORTS FOR MILLIEMES  
OF SILVER.

| MILL. | Fr. | C. | Dwts.            | MILL. | Fr. | C. | Dwts.              |
|-------|-----|----|------------------|-------|-----|----|--------------------|
| 1000  | 218 | 89 | B 18             | 953   | 208 | 60 | B 6 $\frac{1}{2}$  |
| 999   | 218 | 67 | 17 $\frac{3}{4}$ | 952   | 208 | 38 | 6 $\frac{1}{4}$    |
| 998   | 218 | 45 | 17 $\frac{1}{2}$ | 951   | 208 | 16 | 6                  |
| 997   | 218 | 23 | 17 $\frac{1}{4}$ | 950   | 207 | 94 | 6                  |
| 996   | 218 | 01 | 17               | 949   | 207 | 73 | 5 $\frac{3}{4}$    |
| 995   | 217 | 79 | 16 $\frac{3}{4}$ | 948   | 207 | 51 | 5 $\frac{1}{2}$    |
| 994   | 217 | 58 | 16 $\frac{1}{2}$ | 947   | 207 | 29 | 5 $\frac{1}{4}$    |
| 993   | 217 | 36 | 16 $\frac{1}{4}$ | 946   | 207 | 07 | 5                  |
| 992   | 217 | 14 | 16               | 945   | 206 | 85 | 4 $\frac{3}{4}$    |
| 991   | 216 | 92 | 15 $\frac{3}{4}$ | 944   | 206 | 63 | 4 $\frac{1}{2}$    |
| 990   | 216 | 70 | 15 $\frac{1}{2}$ | 943   | 206 | 41 | 4 $\frac{1}{4}$    |
| 989   | 216 | 48 | 15 $\frac{1}{4}$ | 942   | 206 | 19 | 4                  |
| 988   | 216 | 26 | 15               | 941   | 205 | 97 | 3 $\frac{3}{4}$    |
| 987   | 216 | 04 | 14 $\frac{3}{4}$ | 940   | 205 | 76 | 3 $\frac{1}{2}$    |
| 986   | 215 | 82 | 14 $\frac{1}{2}$ | 939   | 205 | 54 | 3 $\frac{1}{4}$    |
| 985   | 215 | 61 | 14 $\frac{1}{4}$ | 938   | 205 | 32 | 3                  |
| 984   | 215 | 39 | 14               | 937   | 205 | 10 | 2 $\frac{3}{4}$    |
| 983   | 215 | 17 | 13 $\frac{3}{4}$ | 936   | 204 | 88 | 2 $\frac{1}{2}$    |
| 982   | 214 | 95 | 13 $\frac{1}{2}$ | 935   | 204 | 66 | 2 $\frac{1}{4}$    |
| 981   | 214 | 73 | 13 $\frac{1}{4}$ | 934   | 204 | 44 | 2                  |
| 980   | 214 | 51 | 13               | 933   | 204 | 22 | 1 $\frac{3}{4}$    |
| 979   | 214 | 29 | 12 $\frac{3}{4}$ | 932   | 204 | 00 | 1 $\frac{1}{2}$    |
| 978   | 214 | 07 | 12 $\frac{1}{2}$ | 931   | 203 | 79 | 1 $\frac{1}{4}$    |
| 977   | 213 | 85 | 12 $\frac{1}{4}$ | 930   | 203 | 57 | 1                  |
| 976   | 213 | 64 | 12               | 929   | 203 | 35 | 0 $\frac{3}{4}$    |
| 975   | 213 | 42 | 12               | 928   | 203 | 13 | 0 $\frac{1}{2}$    |
| 974   | 213 | 20 | 11 $\frac{3}{4}$ | 927   | 202 | 91 | 0 $\frac{1}{4}$    |
| 973   | 212 | 98 | 11 $\frac{1}{2}$ | 926   | 202 | 69 | St                 |
| 972   | 212 | 76 | 11 $\frac{1}{4}$ | 925   | 202 | 47 | St                 |
| 971   | 212 | 54 | 11               | 924   | 202 | 25 | W. 0 $\frac{1}{4}$ |
| 970   | 212 | 32 | 10 $\frac{3}{4}$ | 923   | 202 | 03 | 0 $\frac{1}{2}$    |
| 969   | 212 | 10 | 10 $\frac{1}{2}$ | 922   | 201 | 82 | 0 $\frac{3}{4}$    |
| 968   | 211 | 88 | 10 $\frac{1}{4}$ | 921   | 201 | 60 | 1                  |
| 967   | 211 | 67 | 10               | 920   | 201 | 38 | 1 $\frac{1}{4}$    |
| 966   | 211 | 45 | 9 $\frac{3}{4}$  | 919   | 201 | 16 | 1 $\frac{1}{2}$    |
| 965   | 211 | 23 | 9 $\frac{1}{2}$  | 918   | 200 | 94 | 1 $\frac{3}{4}$    |
| 964   | 211 | 01 | 9 $\frac{1}{4}$  | 917   | 200 | 72 | 2                  |
| 963   | 210 | 79 | 9                | 916   | 200 | 50 | 2 $\frac{1}{4}$    |
| 962   | 210 | 57 | 8 $\frac{3}{4}$  | 915   | 200 | 28 | 2 $\frac{1}{2}$    |
| 961   | 210 | 35 | 8 $\frac{1}{2}$  | 914   | 200 | 06 | 2 $\frac{3}{4}$    |
| 960   | 210 | 13 | 8 $\frac{1}{4}$  | 913   | 199 | 85 | 3                  |
| 959   | 209 | 91 | 8                | 912   | 199 | 63 | 3 $\frac{1}{4}$    |
| 958   | 209 | 70 | 7 $\frac{3}{4}$  | 911   | 199 | 41 | 3 $\frac{1}{2}$    |
| 957   | 209 | 48 | 7 $\frac{1}{2}$  | 910   | 199 | 19 | 3 $\frac{3}{4}$    |
| 956   | 209 | 26 | 7 $\frac{1}{4}$  | 909   | 198 | 97 | 4                  |
| 955   | 209 | 04 | 7                | 908   | 198 | 75 | 4 $\frac{1}{4}$    |
| 954   | 208 | 82 | 6 $\frac{3}{4}$  | 907   | 198 | 53 | 4 $\frac{1}{2}$    |

TARIF RATES AND BRITISH REPORTS FOR MILLIEMES  
OF SILVER.

| Mill. | Fr. | C. | Dwts.             | Mill. | Fr. | C. | Dwts.            |
|-------|-----|----|-------------------|-------|-----|----|------------------|
| 906   | 198 | 31 | W 4 $\frac{3}{4}$ | 859   | 188 | 03 | W 16             |
| 905   | 198 | 09 | 5                 | 858   | 187 | 81 | 16 $\frac{1}{4}$ |
| 904   | 197 | 88 | 5 $\frac{1}{4}$   | 857   | 187 | 59 | 16 $\frac{1}{2}$ |
| 903   | 197 | 66 | 5 $\frac{1}{2}$   | 856   | 187 | 37 | 16 $\frac{3}{4}$ |
| 902   | 197 | 44 | 5 $\frac{3}{4}$   | 855   | 187 | 15 | 17               |
| 901   | 197 | 22 | 6                 | 854   | 186 | 93 | 17 $\frac{1}{4}$ |
| 900   | 197 | 00 | 6                 | 853   | 186 | 71 | 17 $\frac{1}{2}$ |
| 899   | 196 | 78 | 6 $\frac{1}{4}$   | 852   | 186 | 49 | 17 $\frac{3}{4}$ |
| 898   | 196 | 56 | 6 $\frac{1}{2}$   | 851   | 186 | 27 | 18               |
| 897   | 196 | 34 | 6 $\frac{3}{4}$   | 850   | 186 | 06 | 18               |
| 896   | 196 | 12 | 7                 | 849   | 185 | 84 | 18 $\frac{1}{4}$ |
| 895   | 195 | 91 | 7 $\frac{1}{4}$   | 848   | 185 | 62 | 18 $\frac{1}{2}$ |
| 894   | 195 | 69 | 7 $\frac{1}{2}$   | 847   | 185 | 40 | 18 $\frac{3}{4}$ |
| 893   | 195 | 47 | 7 $\frac{3}{4}$   | 846   | 185 | 18 | 19               |
| 892   | 195 | 25 | 8                 | 845   | 184 | 96 | 19 $\frac{1}{4}$ |
| 891   | 195 | 03 | 8 $\frac{1}{4}$   | 844   | 184 | 74 | 19 $\frac{1}{2}$ |
| 890   | 194 | 81 | 8 $\frac{1}{2}$   | 843   | 184 | 52 | 19 $\frac{3}{4}$ |
| 889   | 194 | 59 | 8 $\frac{3}{4}$   | 842   | 184 | 30 | 1                |
| 888   | 194 | 37 | 9                 | 841   | 184 | 09 | 1                |
| 887   | 194 | 15 | 9 $\frac{1}{4}$   | 840   | 183 | 87 | 1                |
| 886   | 193 | 94 | 9 $\frac{1}{2}$   | 839   | 183 | 65 | 1                |
| 885   | 193 | 72 | 9 $\frac{3}{4}$   | 838   | 183 | 43 | 1                |
| 884   | 193 | 50 | 10                | 837   | 183 | 21 | 1                |
| 883   | 193 | 28 | 10 $\frac{1}{4}$  | 836   | 182 | 99 | 1                |
| 882   | 193 | 06 | 10 $\frac{1}{2}$  | 835   | 182 | 77 | 1                |
| 881   | 192 | 84 | 10 $\frac{3}{4}$  | 834   | 182 | 55 | 1                |
| 880   | 192 | 62 | 11                | 833   | 182 | 33 | 1                |
| 879   | 192 | 40 | 11 $\frac{1}{4}$  | 832   | 182 | 12 | 1                |
| 878   | 192 | 18 | 11 $\frac{1}{2}$  | 831   | 181 | 90 | 1                |
| 877   | 191 | 97 | 11 $\frac{3}{4}$  | 830   | 181 | 68 | 1                |
| 876   | 191 | 75 | 12                | 829   | 181 | 46 | 1                |
| 875   | 191 | 53 | 12                | 828   | 181 | 24 | 1                |
| 874   | 191 | 31 | 12 $\frac{1}{4}$  | 827   | 181 | 02 | 1                |
| 873   | 161 | 09 | 12 $\frac{1}{2}$  | 826   | 180 | 80 | 1                |
| 872   | 190 | 87 | 12 $\frac{3}{4}$  | 825   | 180 | 58 | 1                |
| 871   | 190 | 65 | 13                | 824   | 180 | 36 | 1                |
| 870   | 190 | 43 | 13 $\frac{1}{4}$  | 823   | 180 | 15 | 1                |
| 869   | 190 | 21 | 13 $\frac{1}{2}$  | 822   | 179 | 93 | 1                |
| 868   | 190 | 00 | 13 $\frac{3}{4}$  | 821   | 179 | 71 | 1                |
| 867   | 189 | 78 | 14                | 820   | 179 | 49 | 1                |
| 866   | 189 | 56 | 14 $\frac{1}{4}$  | 819   | 179 | 27 | 1                |
| 865   | 189 | 34 | 14 $\frac{1}{2}$  | 818   | 179 | 05 | 1                |
| 864   | 189 | 12 | 14 $\frac{3}{4}$  | 817   | 178 | 83 | 1                |
| 863   | 188 | 90 | 15                | 816   | 178 | 61 | 1                |
| 862   | 188 | 68 | 15 $\frac{1}{4}$  | 815   | 178 | 39 | 1                |
| 861   | 188 | 46 | 15 $\frac{1}{2}$  | 814   | 178 | 18 | 1                |
| 860   | 188 | 24 | 15 $\frac{3}{4}$  | 813   | 177 | 96 | 1                |

## NETHERLAND REPORTS.

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The Netherland reports of both Gold and Silver are made in Millièmes fine, and they therefore bear the same relation to the British Standards as those of France.

The valuation of Gold is made from the fixed price of Florins 1442 60 Cents, per Netherland Pond, with an Agio or Premium that is usually about 13 or 14 per Cent.

The valuation of Silver is made from the fine weight, at a variable price per Pond without any Agio.

The Mint at Utrecht receives Gold at the fixed rate of Florins 1442 60 Cents without any Agio, and renders Ducats in return at the rate of 5 Florins each, which is so much under the usual market price of this Coin, as to fully compensate for the loss of the Agio.

In the valuation of either Gold or Silver, the practice is to cast out the fine weight, and to find its value either from the fixed price with the Agio for Gold, or from the market price for Silver.

Thus, Ponden 6.802 of Gold 997 fine, at  $14\frac{1}{2}$  premium.  
 Ponden 6.802  $\times$  997 = Ponden 6.781,594  
 Florins 1442.60  $\times$  6.781,594 = Flor. 9783 13 Cents.  
                                    $14\frac{1}{2}$  per Cent — 1418 55  
Amount, Florins 11201 68 Cents.

Also, Ponden 11.408 of Silver 925 fine, at 104 50 Flor.  
 Ponden 11.408  $\times$  925 = Ponden 10.552,4  
 Florins 10.552,4  $\times$  104.50 = Florins 1102 73 Cents.

### EXERCISES.

- Ex. 1. Ponden 12.848 of Gold 911 fine, at  $14\frac{1}{2}$  premium.
2. Ponden 21.753 of Silver 896 fine, at 104.50 Florins.
3. What number of Ducats should be rendered for Ponden 31.828 of Gold reported 946 fine?

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### PRODUCTS.

- Ex. 1. Florins 19291.06                      Ex. 2. Florins 2036.68  
 Ex. 3. Ducats 8687—66 Cents over.

## GERMAN REPORTS.

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The Assay Mark of 288 Grains is, throughout Germany, the integer for Assays both of Gold and of Silver.

For Assays of Gold, the Assay Mark is divided into 24 Carats, each of 12 Grains.

For Assays of Silver, the Assay Mark is divided into 16 Loths, each of 18 Grains.

The practice of German Assayers is to report the fine metal only, and the valuation is made from the quantity of fine Gold or Silver produced from the full weight, according to the Assay Report, at the given price per Cologne or Hamburg Banco Mark weight ;\* as,

Gold—438½ Bco Mks per fine Mark.

Silver—27 Mks 10 Sch. per fine Mark.

Until lately it was the practice to make the valuation of Gold from the fine weight, at a given price per Ducat, (as 103 Schillings Bco per Ducat *al Marco*,) reckoning 67 Ducats of the purity of 23½ Carats, to be contained in the Cologne Mark of fine Gold, according to which mode of calculation,

1000 Oz. British St. Gold = 8345.57 Ducats.

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\* With respect to the word Mark it must be remembered, that  
The Assay Mark is the integer of fineness;  
The Cologne Mark, for weight; and  
The Mark in Banco or Currency for money, of account and Coin.

## EXAMPLE 1.

To compare the German Gold-report of 23 Carats 11 Grains fine, with British Standard.

Directions.—The German Carats being reckoned as English Carats, divide the German Grains by 3, and if 1 remains call it  $\frac{1}{3}$ , or if 2,  $\frac{1}{2}$  or  $\frac{2}{3}$  of an English Grain;\* then find the difference between this purity and 22 Carats for the Betterness or Worseness.

$$\begin{array}{r}
 \text{German Car. 23 11 Gr.} = 23 \quad 3\frac{2}{3} \quad \text{British.} \\
 \qquad \qquad \qquad \qquad \qquad \qquad 22 \quad 0 \quad \text{Standard.} \\
 \hline
 \text{Carat} \quad 1 \quad 3\frac{2}{3} \quad \text{Better.} \\
 \hline
 \end{array}$$

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## EXAMPLE 2.

To compare the German Silver-report of 13 Loths 15 Grains fine, with British Standard.

Directions.—Take the difference between the given report and 14 Loths 14.4 Grs, which are equal to 11 Oz. 2 Dwts, the British Standard for Silver; then reduce, if necessary, the difference to Grains and 10 ths of Grains, and divide the result by 12 for the Betterness or Worseness in Dwts.

$$\begin{array}{r}
 \text{Loths} \quad 14 \quad 14.4 \quad \text{Grs.} \\
 \text{Given report} \quad 13 \quad 15 \\
 \hline
 12 \quad ) \quad 17 \quad 4 \quad \text{tenths of Grains.} \\
 \hline
 \text{Worse} \quad \quad 14\frac{1}{2} \quad \text{Dwts.} \\
 \hline
 \end{array}$$

Observe, that in dividing by 12, if the remainder is not exactly half a Dwt, it is to be reckoned at the next lower  $\frac{1}{2}$  Dwt for Betterness, and at the next higher, for Worseness.

---

\* When the German report is made in half or quarter grains, multiply the remainder by 8 and divide the product by 3, for 8 ths of English grains.



## EXAMPLE 3.

To find the value of a Bar of Gold weighing Mks 48 12 Loths, reported 21 Carats 6 Grains fine, at  $435\frac{1}{2}$  Bco Mks per fine Mark.

$\frac{1}{2}$	-	-	Mks	l	g	
			48	12	0	Full Weight.
$\frac{1}{2}$	-	-	24	6	0	for 12 Carats.
$\frac{1}{3}$	-	-	12	3	0	— 6
$\frac{1}{9}$	-	-	6	1	9	— 3
			10	15	—	9 Grs.
			Mks	43	5	6
			Fine weight.			

			Bco Mks
$\frac{1}{4}$	-	-	435.5 price per Mark
			43
			1306.5
			17420
$\frac{1}{4}$	-	-	108.87 for 6 Loths.
$\frac{1}{3}$	-	-	27.22 — 1
			9 07 — 6 Grs.
Bco Mks	18871.66	— 10 Sch.	

According to the late method, the formula for making this calculation, supposing the price to have been 101 Sch. Bco, per Ducat, was

			48	12	Mks and Loths ?
Carats	24	—	21	6	Fine.
Fine	$23\frac{1}{2}$	—	24	Ducat Stand.	
Mk	1	—	67	Ducats.	

Result Ducats 2988 26 Grs, or 96 ths.

Value at 101 Sch. Bco Mks 18863 6 Sch.

The Mark for weighing Gold is divided into 16 Loths 288 Grains.

## EXAMPLE 4.

To find the amount of a bar of Silver, weighing Mks 49 14 Loths, reported 14 Loths 8 Grs fine, at 27 Mks 10 Sch. Bco. per Mark fine.

	M	l	g	
$\frac{1}{2}$ - -	49	14	0	Full Weight.
<hr style="width: 50%; margin: 0 auto;"/>				
$\frac{1}{2}$ - -	21	15	0	Fine weight at 8 Loths.
$\frac{1}{2}$ - -	12	7	9	- - 4 -
$\frac{1}{6}$ - -	6	3	13	- - 2 -
$\frac{1}{3}$ - -	1	0	11	- - 6 Grs.
		5	9	- - 2 -
<hr style="width: 50%; margin: 0 auto;"/>				
Hamburg Marks	45	0	6	Fine weight.
<hr style="width: 50%; margin: 0 auto;"/>				
	M	s	pf	
$\frac{1}{2}$ - -	45	0	4	Value at 1 Bco. Mk.
			27	
<hr style="width: 50%; margin: 0 auto;"/>				
	1215	9	0	for 27 Marks.
$\frac{1}{4}$ - -	22	8	2	- 8 Sch.
		5	10	- 2 -
<hr style="width: 50%; margin: 0 auto;"/>				
Banco Marks	1243	11	0	Amount required.

The Pfennings in the amount are reckoned at 6, when they are from 3 to 9; above that number they are called 1 Sch. and at 3 and under they are not reckoned.

## EXERCISES.

Ex. 1. What is the amount of a Bar of Gold, weighing Mks 33 12 Loths reported 22 Car. 6 Grs fine, at 440 Bco Mks per fine Ducat?

2. What is the amount of a Bar of Silver, weighing Mks 38 14 $\frac{1}{2}$  Loths reported 15 Loths 12 Grs fine, at Mks 27 12 Sc per Mark fine?

## PRODUCTS.

Ex. 1. Fine Mks 31 10 4 $\frac{1}{2}$  Value Mks 13921 14 Sc.

2. Fine Weight, Mks 38 1 10 — Mks 1057 3 Sc.

## ARBITRATIONS OF BULLION.

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### ARBITRATED PARS OF EXCHANGE.

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The calculations of arbitrated Pars of Exchange from Operations in Bullion, are conducted in a similar manner to the calculations of arbitrated Rates from Bills of Exchange ; but besides the prices in the two places concerned, they require the further data of the relations between their weights for Gold and Silver, and the degrees of fineness at which the prices are reckoned.

In England the price of Bullion is rated at Standard fineness for both Gold and Silver ; but Doubloons, Dollars, and some other Coins, when in large quantities, are usually valued at variable prices per Oz. corresponding with their estimated fineness.

When Pars of Exchange are formed from Coins, they are usually reckoned from their mintage regulations, with regard to weight and fineness, and from their value as money in each of the two Countries ; but this valuation is but of little practical utility, because, 1st, in this Country Gold is the established medium of payment, and the Gold Coin cannot be sold at a premium or discount ; whereas on the Continent, generally, Gold is not the medium, and the Gold Coins are seldom current at only the exact price legally or nominally given to them ; —and, 2 ndly, with respect to Silver, the British mintage price, 66 d per Oz. is so high in comparison with the price that Standard Silver has borne in this Country for many years past, and it is also so much higher in comparison with Gold than it is upon the Continent, that it cannot with any propriety be used as one of the terms for finding a par of exchange.—For these reasons

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N. B. The calculations of Arbitrations of Bullion are divided into Arbitrated Rates or Pars of Exchange and Arbitrated Prices.

therefore, in all our valuations of this nature, we have used the mintage price only for Gold, and we have used the rate of 60 d per Oz. Standard for Silver, both because it has long been its full market value in this country, and because it affords a very convenient fixed value, to be proportioned to any other price to which Silver may vary.

The relations between the Gold and Silver weight of this Country, and those of the chief Countries of Europe, have been given in the table, page 4, and the modes of valuation and their standards of fineness have been explained in the preceding pages, but as the former are hardly minute enough for our present object, it is necessary to state the absolute weight of each Integer, as is done in the introduction to each of the following departments, for the places selected for the operations ; viz.

Paris — in Bar Gold and Silver, Doubloons and Dollars.

Amsterdam — the same.

Hamburg — the same.

Frankfort — the same except Doubloons.

Berlin, Petersburg, Naples, and Lisbon, in Bar Gold and Silver.

To each of the formulæ a fixed number\* is first found, independent of either price, and then a fixed number for the assumed price per Ounce ; and to facilitate the calculations at other prices a table is given at the foot of each formula, for the prices within the usual extreme limits of the fluctuations, for each of the first four places, but they are omitted to the remaining formulæ, as being for places with which this Country transacts but little business of this nature.

---

\* As directed in page 93, the fixed number is formed by multiplying the numbers of the fixed terms on each side of the Equation together, and dividing the product of the consequents, (the right hand terms,) by the product of the antecedents.

The variable terms are as before marked with an Asterisk.

## PARIS.

---

The Gold and Silver weight is the Kilogramme of 1000 Grammes: it is reckoned equal to 15434 Grains English Troy Weight, making the Oz. Troy of 480 Grains equal to 31.1002 Grammes. Hence,

1000 Oz. British Standard Gold	=	Kilogr.	28.5085	F. Gold.
1000 Oz. British Standard Silver	=	—	28.7677	F. Silv.
1000 Oz. Doll. Worse 7 Dwts	=	—	27.8606	Ditto.
7½ Dwts	=	—	27.7958	Ditto.
8 Dwts	=	—	27.7310	Ditto.

The British Standard for Gold has no exact Tarif price, but as being 11-12 ths or 916.66 fine, it is rated at 31.18.24 Francs.

Bar Silver at the British Standard purity of 37-40 ths, or 925 fine, is tarified at 202.47 Francs per Kilogramme.

Dollar Silver is usually rated as being 896 fine, (7 Dwts Worse,) at 196.12 Francs per Kilogramme.—For any other degree of purity from 890 fine, a correction to this rate is to be applied from the table page 177, according to the method of the example there given.

Dollars are also sold in Paris by the piece,\* for which there is a separate formula.

---

In applying the Charges or comparing the Rates,

25¼ or 24 Cents are reckoned 1 per Cent.

22	—	21	—	. . . . .	¾	—
19	—	18	—	. . . . .	¾	—
15½	—	15	—	. . . . .	¾	—
12½	—	12	—	. . . . .	½	—
9¼	—	9	—	. . . . .	¾	—
6¼	—	6	—	. . . . .	¼	—
		3	—	. . . . .	⅛	—

---

\* It may be more correctly said, that in Paris they are usually melted and sold as Bar Silver according to their purity, and at Lille, and generally at the French mints, they are sold by the piece.

## PARIS.

---

Bar Gold in London is 77 s 6 d per Oz. Standard ; in Paris,  $4\frac{1}{2}$  per Mille Premium ; required the arbitrated Rate or Par of Exchange.

	20	Shillings ?	
$77\frac{1}{2}$ *	—	1	Oz. Standard.
1	—	31.1002	Grammes.
1000	—	3148.24	Frs and Cts.
1000	—	* 1004 $\frac{1}{2}$	With Premium.
$77\frac{1}{2}$	)	1958217	Fixed Number.
		<hr style="width: 10%; margin: 0 auto;"/>	
		25.267	Do. for 77 s 6d
25.26	× 4 =	- .101	Prem. 4 per Mille.
		- .013	— $\frac{1}{2}$ —
		<hr style="width: 10%; margin: 0 auto;"/>	
Francs		25 38,1	Cents.
		<hr style="width: 10%; margin: 0 auto;"/>	

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Fixed Numbers for Prices per Oz.

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|    |                  |   |   |   |        |
|----|------------------|---|---|---|--------|
| s  | d                |   |   |   |        |
| 77 | 6                | . | . | . | 25.267 |
| -  | 9                | . | . | . | - .186 |
| -  | 10 $\frac{1}{2}$ | . | . | . | - .146 |
| 78 | -                | . | . | . | - .105 |
| -  | 3                | . | . | . | - .025 |
| -  | 6                | . | . | . | 24.945 |

## PARIS.

---

Doubloons in London are 75 s 3 d per Oz ; in Paris, Frs 82 35 Cents each ; required the arbitrated Rate of Exchange.

|                    |   |                                                               |
|--------------------|---|---------------------------------------------------------------|
|                    |   | 20 Shillings ?                                                |
| 75 $\frac{1}{4}$ * | — | 1 Ounce.                                                      |
| 868                | — | 1000 Doubloons                                                |
| 1                  | — | * 82.35 Francs.                                               |
|                    |   |                                                               |
| 75 $\frac{1}{4}$   | ) | 230414 Fixed Number.                                          |
|                    |   | <hr style="width: 10%; margin-left: auto; margin-right: 0;"/> |
|                    |   | 30620 Ditto for 75 s 3 d                                      |
| Multiply by        |   | 82.35                                                         |
|                    |   | <hr style="width: 10%; margin-left: auto; margin-right: 0;"/> |
| Francs             |   | 25 21,5 Cents.                                                |
|                    |   | <hr style="width: 10%; margin-left: auto; margin-right: 0;"/> |



### Fixed Numbers for Prices per Oz.

---

| s  | d |             | s  | d |             |
|----|---|-------------|----|---|-------------|
| 73 | - | . . . 31564 | 76 | - | . . . 30318 |
| -  | 3 | . . . - 456 | -  | 3 | . . . - 218 |
| -  | 6 | . . . - 349 | -  | 6 | . . . - 119 |
| -  | 9 | . . . - 243 | -  | 9 | . . . - 021 |
| 74 | - | . . . - 137 | 77 | - | . . . 29924 |
| -  | 3 | . . . - 032 | -  | 3 | . . . - 827 |
| -  | 6 | . . . 30928 | -  | 6 | . . . - 731 |
| -  | 9 | . . . - 825 | -  | 9 | . . . - 635 |
| 75 | - | . . . - 722 | 78 | - | . . . - 540 |
| -  | 3 | . . . - 620 | -  | 3 | . . . - 446 |
| -  | 6 | . . . - 518 | -  | 6 | . . . - 352 |
| -  | 9 | . . . - 418 | -  | 9 | . . . - 259 |

PARIS.

---

Bar Silver in London is  $59\frac{1}{2}$  d per Oz. Standard ; in Paris, 4 per Mille Premium ; required the arbitrated Rate of Exchange.

|                   |     |                                  |
|-------------------|-----|----------------------------------|
|                   | 240 | Pence ?                          |
| $59\frac{1}{2}$ * | —   | 1 Oz. Standard.                  |
| 1                 | —   | 31.1002 Grammes.                 |
| 1000              | —   | 202.47 Francs.                   |
| 1000              | —   | * 1004 With Premium.             |
|                   |     |                                  |
| $59\frac{1}{2}$   | )   | 1511245 Fixed Number.            |
|                   |     | 25.399 Do. for $59\frac{1}{2}$ d |
| $25.3 \times 4 =$ | =   | .101 Prem. 4 per Mille.          |
|                   |     | Francs 25 50 Cents.              |

Fixed Numbers for Prices per Oz.

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|                 |       |                              |
|-----------------|-------|------------------------------|
| d               |       | d                            |
| 59 -            | . . . | 25.614                       |
| - $\frac{1}{8}$ | . . . | - .560                       |
| - $\frac{1}{4}$ | . . . | - .506                       |
| - $\frac{3}{8}$ | . . . | - .453                       |
| - $\frac{1}{2}$ | . . . | - .399                       |
| - $\frac{5}{8}$ | . . . | - .346                       |
| - $\frac{7}{8}$ | . . . | - .293                       |
| - $\frac{7}{8}$ | . . . | - .240                       |
|                 |       | 60 - . . . 25.187            |
|                 |       | - $\frac{1}{8}$ . . . - .135 |
|                 |       | - $\frac{1}{4}$ . . . - .083 |
|                 |       | - $\frac{3}{8}$ . . . - .031 |
|                 |       | - $\frac{1}{2}$ . . . 24.979 |
|                 |       | - $\frac{5}{8}$ . . . - .928 |
|                 |       | - $\frac{3}{4}$ . . . - .876 |
|                 |       | - $\frac{7}{8}$ . . . - .825 |



## PARIS.

---

Dollars in London are  $57\frac{1}{2}$  d per Oz.; in Paris, Frs. 5.30 each; required the arbitrated Rate of Exchange.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |         |                           |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---------------------------|-----------------|---|--------|---------------|--|--|-------|---------------------------|--|--|-----|--|--|--|-------|--|--|--|-------|--|--------|--|---------|--------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 240     | Pence ?                   |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
| $57\frac{1}{2}$ *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | — | 1       | Ounce.                    |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
| 866                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | — | 1000    | Dollars.                  |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | — | * 5.30  | Francs.                   |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
| <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;"><math>57\frac{1}{2}</math></td> <td style="font-size: 2em; vertical-align: middle;">)</td> <td style="text-align: right; border-top: 1px solid black;">277136</td> <td>Fixed Number.</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right; border-top: 1px solid black;">48198</td> <td>Do. for <math>57\frac{1}{2}</math> d</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">530</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: right; border-top: 1px solid black;">14459</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">24099</td> <td></td> </tr> <tr> <td style="text-align: right;">Francs</td> <td></td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 1px solid black;">25 54,5</td> <td>Cents.</td> </tr> </table> |   |         |                           | $57\frac{1}{2}$ | ) | 277136 | Fixed Number. |  |  | 48198 | Do. for $57\frac{1}{2}$ d |  |  | 530 |  |  |  | 14459 |  |  |  | 24099 |  | Francs |  | 25 54,5 | Cents. |
| $57\frac{1}{2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ) | 277136  | Fixed Number.             |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 48198   | Do. for $57\frac{1}{2}$ d |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 530     |                           |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 14459   |                           |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 24099   |                           |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |
| Francs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   | 25 54,5 | Cents.                    |                 |   |        |               |  |  |       |                           |  |  |     |  |  |  |       |  |  |  |       |  |        |  |         |        |

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### Fixed Numbers for Prices per Oz.

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d			d		
56 $\frac{1}{2}$	.	.	57 $\frac{3}{4}$	.	.
49050			47989		
- $\frac{5}{8}$	.	.	- $\frac{7}{8}$	.	.
48942			- 885		
- $\frac{3}{4}$	.	.	58 -	.	.
- 834			- 782		
- $\frac{7}{8}$	.	.	- $\frac{1}{8}$	.	.
- 727			- 679		
57 -	.	.	- $\frac{1}{4}$	.	.
- 620			- 577		
- $\frac{1}{8}$	.	.	- $\frac{3}{8}$	.	.
- 514			- 475		
- $\frac{1}{4}$	.	.	- $\frac{1}{2}$	.	.
- 408			- 374		
- $\frac{3}{8}$	.	.	- $\frac{5}{8}$	.	.
- 303			- 273		
- $\frac{1}{2}$	.	.	- $\frac{3}{4}$	.	.
- 198			- 172		
- $\frac{5}{8}$	.	.	- $\frac{7}{8}$	.	.
- 093			- 072		

## PARIS.

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Dollars in London are  $57\frac{1}{2}$  d per Oz.; in Paris, 4 per Mille Premium; required the arbitrated Rate of Exchange.

		240	Pence ?																
$57\frac{1}{2}$ *	—	1	Ounce.																
1	—	31.1002	Grammes.																
1000	—	196.12	Francs.																
1000	—	* 1004	With Premium.																
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;"><math>57\frac{1}{2}</math></td> <td style="font-size: 2em; vertical-align: middle;">)</td> <td style="text-align: right; border-bottom: 1px solid black;">1463849</td> <td>Fixed Number.</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">25.458</td> <td>Do. for <math>57\frac{1}{2}</math> d</td> </tr> <tr> <td style="text-align: right;"><math>254 \times 4 =</math></td> <td></td> <td style="text-align: right; border-bottom: 1px solid black;">.102</td> <td>Prem. 4 per Mille.</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">Francs 25 56</td> <td>Cents.</td> </tr> </table>				$57\frac{1}{2}$	)	1463849	Fixed Number.			25.458	Do. for $57\frac{1}{2}$ d	$254 \times 4 =$		.102	Prem. 4 per Mille.			Francs 25 56	Cents.
$57\frac{1}{2}$	)	1463849	Fixed Number.																
		25.458	Do. for $57\frac{1}{2}$ d																
$254 \times 4 =$		.102	Prem. 4 per Mille.																
		Francs 25 56	Cents.																

~~~~~

Fixed Numbers for Prices per Oz. at 896 Fine.

| d               |   |        | d               |   |        |
|-----------------|---|--------|-----------------|---|--------|
| $56\frac{1}{3}$ | . | 25.909 | $57\frac{3}{4}$ | . | 25.348 |
| - $\frac{5}{8}$ | . | - .852 | - $\frac{7}{8}$ | . | - .293 |
| - $\frac{3}{4}$ | . | - .795 | 58 -            | . | - .239 |
| - $\frac{7}{8}$ | . | - .738 | - $\frac{1}{8}$ | . | - .184 |
| 57 -            | . | - .682 | - $\frac{1}{4}$ | . | - .130 |
| - $\frac{1}{8}$ | . | - .625 | - $\frac{3}{8}$ | . | - .077 |
| - $\frac{1}{4}$ | . | - .569 | - $\frac{1}{2}$ | . | - .023 |
| - $\frac{5}{8}$ | . | - .514 | - $\frac{5}{8}$ | . | 24.970 |
| - $\frac{7}{8}$ | . | - .458 | - $\frac{3}{4}$ | . | - .917 |
| - 58            | . | - .403 | - $\frac{7}{8}$ | . | - .864 |

## DOLLAR SILVER AT PARIS.

Table of Parts for Purities from 890 to 902 Fine.

| Subt.<br>for | d<br>56½ | d<br>57 | d<br>57½ | d<br>58 | d<br>58½ | Add<br>for |
|--------------|----------|---------|----------|---------|----------|------------|
| 890          | 173      | 172     | 170      | 169     | 168      | 902        |
| 891          | 145      | 143     | 142      | 141     | 140      | 901        |
| 892          | 116      | 115     | 114      | 113     | 112      | 900        |
| 893          | 87       | 86      | 85       | 85      | 84       | 899        |
| 894          | 58       | 57      | 57       | 56      | 56       | 898        |
| 895          | 29       | 29      | 28       | 28      | 28       | 897        |

## EXAMPLE

Of the application of this Table.

Dollar Silver, reported 893 Fine.

London Price, 57½ d per Oz. — Paris, 4 per Mille.

By the preceding Table for 896 fine,

the Fixed Number for 57½ d is . . . 25.458

Subtract as above for 893 . . . . . 85

25.373\*

4 per Mille . . . 101

Francs 25.47<sup>4</sup>/<sub>10</sub>

\* The same result is obtained by working this Equation.

|                        |   |         |                    |
|------------------------|---|---------|--------------------|
|                        |   | 240     | Pence ?            |
| 57½ *                  | — | 1       | Oz. Dollar Silver. |
| 1                      | — | 31.1002 | Grammes.           |
| 1000                   | — | * 893   | Fine.              |
| 900                    | — | 197     | Francs.            |
| Result, Francs 25 37,3 |   |         | Cents.             |

## AMSTERDAM.

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The Netherland Pond is of the same weight as the French Kilogramme, viz. 15434 Grains, or 2 lb 7 oz. 3 dwts 2 grs Troy, and it is similarly divided into 1000 equal parts called Wigties or Grammes; hence the same relations exist between the British and Netherland Weights of Standard and fine Gold, and Silver, as those given in page 171.

Also as the Mint at Utrecht receives the Pond of fine Gold at the fixed price of Florins 1442.60, and delivers Ducats in return at the fixed price of 5 Florins each,

1000 Oz. of British Standard Gold produce 8225.269 Ducats.

Doubloons bought in London at variable prices per Oz. are usually melted into Bars before they are sold at Amsterdam—Spanish Doubloons from 1 Car. 0 $\frac{3}{4}$  Gr. Worse to 1 Car. 0 $\frac{1}{2}$  Gr. Worse, generally render about 867 fine; the Formula and fixed Numbers are therefore calculated for this purity, variations being estimated in the manner directed page 181.

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In estimating the Charges and the differences in the Rates.

| 12               | Cents | or | 2.4 | Stivers | are | 1             | per Cent. |
|------------------|-------|----|-----|---------|-----|---------------|-----------|
| 10 $\frac{1}{2}$ | —     | .  | 2.1 | —       | .   | $\frac{7}{8}$ | —         |
| 9                | —     | .  | 1.8 | —       | .   | $\frac{3}{4}$ | —         |
| 7 $\frac{1}{2}$  | —     | .  | 1.5 | —       | .   | $\frac{5}{8}$ | —         |
| 6                | —     | .  | 1.2 | —       | .   | $\frac{1}{2}$ | —         |
| 4 $\frac{1}{2}$  | —     | .  | .9  | —       | .   | $\frac{3}{8}$ | —         |
| 3                | —     | .  | .6  | —       | .   | $\frac{1}{4}$ | —         |
| 1 $\frac{1}{2}$  | —     | .  | .3  | —       | .   | $\frac{1}{8}$ | —         |

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N. B. The Florin in the Netherlands Rate being divided into 100 Cents, and in the London Rate into Stivers, the Cents in the arbitrated Rates must be divided by 5, if it is required to express them in Stivers.

## AMSTERDAM.

---

Bar Gold in London is 77 s 6 d per Oz. Standard; in Amsterdam, 14 per Cent Premium; required the arbitrated Rate of Exchange.

|         |   |                                                               |                      |
|---------|---|---------------------------------------------------------------|----------------------|
|         |   | 20                                                            | Shillings ?          |
| 77½ *   | — | 1                                                             | Oz. Standard.        |
| 12      | — | 11                                                            | Fine.                |
| 1       | — | 31.1002                                                       | Wigties.             |
| 1000    | — | 1442.60                                                       | Florins.             |
| 100     | — | * 114                                                         | With Premium.        |
|         |   |                                                               |                      |
| 7½      | ) | 822527                                                        | Fixed Number.        |
|         |   | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                      |
|         |   | 10.613                                                        | Do. for 77 s 6 d     |
|         |   | 1.061                                                         | Premium 10 per Cent. |
|         |   | .425                                                          | —      4      —      |
|         |   | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                      |
| Florins |   | 12 09,9                                                       | Cents.               |
|         |   | <hr style="width: 50%; margin-left: auto; margin-right: 0;"/> |                      |

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### Fixed Numbers for Prices per Oz.

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s	d				
77	6	.	.	.	10.613
-	9	.	.	.	- .579
-	10½	.	.	.	- .562
78	-	.	.	.	- .545
-	3	.	.	.	- .511
-	6	.	.	.	.478
-	9	.	.	.	.445

## AMSTERDAM

---

Doubloons in London are 75 s '3 d per Oz. ; in Amsterdam,  
14 per Ct. Premium ; required the arbitrated Rate of Exchange.

		20	Shillings ?
75 $\frac{1}{4}$ *	—	1	Oz. Doubloon Gold.
1000	—	867	Fine.
1	—	31.1002	Wigties.
1000	—	1442.60	Florins.
100	—	* 114	Florins.

75 $\frac{1}{2}$	)	777961	Fixed Number
		<u>10.338</u>	Do. for 75 s 3 d
		1.034	Prem. 10 per Cent.
		.413	— 4 —

Florins 11 78.5 Cents.



Fixed Numbers for Prices per Oz. at 867 Fine.

s	d		s	d	
73	-	10657	76	-	10236
-	3	- 621	-	3	- 203
-	6	- 585	-	6	- 169
-	9	- 549	-	9	- 136
74	-	- 513	77	-	- 103
-	3	- 478	-	3	- 071
-	6	- 442	-	6	- 038
-	9	- 407	-	9	- 006
75	-	- 373	78	-	9974
-	3	- 338	-	3	- 942
-	6	- 304	-	6	- 910
-	9	- 270	-	9	- 879

## DOUBLOON GOLD AT AMSTERDAM.

Table of Parts for Purities from 860 to 874.

Subt. for	s 73	s 74	s 75	s 76	s 77	s 78	Add for
860	86	85	84	83	82	81	874
861	74	73	72	71	70	69	873
862	61	61	60	59	58	58	872
863	49	48	48	47	47	46	871
864	37	36	36	35	35	35	870
865	25	24	24	24	23	23	869
866	12	12	12	12	12	12	868

## EXAMPLE

Of the application of this Table.

Columbian Doubloons, reported 861 Fine.

London Price, 73 s 8 d — Amsterdam, 14 per Ct.

By the preceding Table

73 s 8 d and 867 fine	. . . . .	10.561
By the above — 861 fine	. . . . .	73
		<u>10.488</u> *
10 per Cent.	. . . . .	1.049
4 per Cent.	. . . . .	.420
		<u>Florins 11.95,7</u>

\* The Equation for the above is

20 Shillings ?

73 8 — 1 Oz. Doubloon Gold.

1000 — 861 Fine.

1 — 31.1002 Wigties.

1000 — 1442.60 Florins.

100 — 114 Florins.

Result 10.48,7 nearly as above.

## AMSTERDAM.

---

Bar Silver in London is  $59\frac{1}{2}$  d per Oz. Standard ; in Amsterdam,  $103\frac{3}{4}$  Florins per Pond Fine ; required the arbitrated Rate of Exchange.

		240	Pence ?																				
$59\frac{1}{2}$ *	—	1	Oz. Standard.																				
40	—	37	Fine.																				
1	—	31.1002	Wigties.																				
1000	—	* $103\frac{3}{4}$	Florins.																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;"><math>59\frac{1}{2}</math></td> <td style="text-align: center;">)</td> <td style="text-align: right;"><u>690.424</u></td> <td>Fixed Number.</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">11.604</td> <td>Do. for <math>59\frac{1}{2}</math> d</td> </tr> <tr> <td style="text-align: right;">116 × 3</td> <td style="text-align: center;">=</td> <td style="text-align: right;">.348</td> <td>for 3 Florins.</td> </tr> <tr> <td style="text-align: right;">1-4 th</td> <td style="text-align: center;">.</td> <td style="text-align: right;"><u>.087</u></td> <td><math>\frac{3}{4}</math> —</td> </tr> <tr> <td style="text-align: right;">Florins</td> <td></td> <td style="text-align: right;"><u>12 03,9</u></td> <td>Cents.</td> </tr> </table>				$59\frac{1}{2}$	)	<u>690.424</u>	Fixed Number.			11.604	Do. for $59\frac{1}{2}$ d	116 × 3	=	.348	for 3 Florins.	1-4 th	.	<u>.087</u>	$\frac{3}{4}$ —	Florins		<u>12 03,9</u>	Cents.
$59\frac{1}{2}$	)	<u>690.424</u>	Fixed Number.																				
		11.604	Do. for $59\frac{1}{2}$ d																				
116 × 3	=	.348	for 3 Florins.																				
1-4 th	.	<u>.087</u>	$\frac{3}{4}$ —																				
Florins		<u>12 03,9</u>	Cents.																				

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Fixed Numbers for Prices per Oz.

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|                 |   |        |                 |   |        |
|-----------------|---|--------|-----------------|---|--------|
| d               |   |        | d               |   |        |
| 59 -            | . | .      | 60 -            | . | .      |
|                 |   | 11.702 |                 |   | 11.507 |
| - $\frac{1}{8}$ | . | .      | - $\frac{1}{8}$ | . | .      |
|                 |   | .677   |                 |   | .483   |
| - $\frac{1}{4}$ | . | .      | - $\frac{1}{4}$ | . | .      |
|                 |   | .653   |                 |   | .459   |
| - $\frac{3}{8}$ | . | .      | - $\frac{3}{8}$ | . | .      |
|                 |   | .628   |                 |   | .436   |
| - $\frac{1}{2}$ | . | .      | - $\frac{1}{2}$ | . | .      |
|                 |   | .604   |                 |   | .412   |
| - $\frac{5}{8}$ | . | .      | - $\frac{5}{8}$ | . | .      |
|                 |   | .579   |                 |   | .388   |
| - $\frac{3}{4}$ | . | .      | - $\frac{3}{4}$ | . | .      |
|                 |   | .555   |                 |   | .365   |
| - $\frac{7}{8}$ | . | .      | - $\frac{7}{8}$ | . | .      |
|                 |   | .531   |                 |   | .342   |



## AMSTERDAM.

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Dollars in London are  $57\frac{1}{2}$  d per Oz. ; in Amsterdam, 2.50 Florins each ; required the arbitrated Rate of Exchange.

|                   |   |                |                           |
|-------------------|---|----------------|---------------------------|
|                   |   | 240            | Pence ?                   |
| $57\frac{1}{2}$ * | — | 1              | Oz.                       |
| 866               | — | 1000           | Dollars.                  |
| 1                 | — | * 2.50         | Florins.                  |
|                   |   |                |                           |
| $57\frac{1}{2}$   | ) | <u>277136</u>  | Fixed Number.             |
|                   |   | 48198          | Do. for $57\frac{1}{2}$ d |
| Multiply by       |   | <u>2.50</u>    |                           |
| Florins           |   | <u>12 04,9</u> | Cents.                    |

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Fixed Numbers for Prices per Oz.

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d				d		
56 $\frac{1}{2}$	.	.	49051	57 $\frac{3}{4}$	.	47989
- $\frac{5}{8}$	.	.	48942	- $\frac{7}{8}$	.	- 885
- $\frac{3}{4}$	.	.	- 835	58 -	.	- 782
- $\frac{7}{8}$	.	.	- 727	- $\frac{1}{8}$	.	- 679
57 -	.	.	- 620	- $\frac{1}{4}$	.	- 577
- $\frac{1}{8}$	.	.	- 514	- $\frac{3}{8}$	.	- 475
- $\frac{1}{4}$	.	.	- 408	- $\frac{1}{2}$	.	- 374
- $\frac{3}{8}$	.	.	- 303	- $\frac{5}{8}$	.	- 273
- $\frac{1}{2}$	.	.	- 198	- $\frac{3}{4}$	.	- 172
- $\frac{5}{8}$	.	.	- 093	- $\frac{7}{8}$	.	- 072

## HAMBURG.

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The Gold and Silver weight is the Cologne Mark, which according to the Standard of the Hamburg Bank, is equal to 3608 Grains, or 7 Oz. 10 Dwts 8 Grs English Troy, making 60 Marks equal to 451 Oz. Troy.

Hence,

10 Col. Mks fine Gold = 82 Oz. British Stand. Gold  
 8 Col. Mks fine Silver =  $65\frac{1}{11}$  Oz. British Stand. Silver

It is, however, not necessary to regard the fraction in the latter of these equations, when it is used in formulæ for Pars of Exchange, because the difference which it makes is less than the 32nd part of a Schilling.

In the formula for Doubloons, the prices are taken for Doubloon Gold in London, and for Bar Gold at Hamburg; the purity is reckoned at 20 Carats  $9\frac{3}{4}$  Grs Fine, which estimate is the same as Worse Car. 1  $0\frac{3}{4}$  Gr., and other degrees of purity are calculated from the Table of parts.

The formula for Dollar Silver is calculated at 14 Loths 5 Grs Fine, the variations in the fineness being also calculated from a Table of parts.

Instead of fixed numbers for the formula for Silver, the quotient of the division by the number of Pence per Oz. is multiplied by  $27\frac{1}{2}$ , and the result valued in Marks and Schillings, is the rate of Exchange at 27 Marks 8 Sch. per Hamburg Mark Fine; to which are to be added, the Schillings and parts taken from the auxiliary Table, for the excess of the price above 27 Mks 8 Sch.

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In estimating the Charges and Differences in the rates of Exchange, taking 13 Mks 8 Sch. as an average rate:

Schillings	2.16-100 ths	are	1	per Cent.
1.89	—	—	$\frac{7}{8}$	—
1.62	—	—	$\frac{3}{4}$	—
1.35	—	—	$\frac{5}{8}$	—
1.08	—	—	$\frac{1}{2}$	—
0.81	—	—	$\frac{3}{8}$	—
0.54	—	—	$\frac{1}{4}$	—
0.27	—	—	$\frac{1}{8}$	—