a great deal more. In confirmation of this, it is thought proper to ſubjoin the dimenſions of ſeveral ſhips, with the tonnage calculated therefrom.

|  |  |
| --- | --- |
| I. ***Audacious of seventy four guns.*** | |
| Length on the gun deck | 168 f. 0 in. |
| Length of the keel for tonnage | 138 0 |
| Extreme breadth | 46 9 |
| Depth of the hold | 19 9 |
| Launching draught of water | 12 0  17 4 |
| Load draught of water | 20 6  21 6 |
| The weight of the ſhip at her launching |  |
| draught of water 1509 t. 678 lbs. | |
| The weight of the furniture | 120 1500 |
| Weight of the ſhip at her light water |  |
| mark | 1629 2178 |
| Weight of the ſhip at her load water |
| mark | 2776 498 |
| Real burthen | 1146 560 |
| By the common rule. |
| Length of the keel for tonnage | 138 f. 0 in. |
| Extreme breadth | 46 9 |
| Product | 6451 6 |
| Half the extreme breadth | 23 4 1/2 |
| 94)150803 | |
| Tonnage according to the common rule | 1604 643 |
| Real burthen | 1146 560 |
| Difference | 458 83 |
| 2. ***An East Indiaman.*** |  |
| Length between the perpendiculars for- |  |
| ward and aft | 13 2 f. 8 in. |
| Length of the keel for tonnage | 105 0 |
| Extreme breadth | 38 0 |
| Depth in hold | 16 0 |
| Launching draught of water | 7 10  I I IO |
| Load draught of water abaft  The weight of the ſhip at her launching | 19 8  20 8 |
| draught of water | 602 t. 2116lbs. |
| The weight of the furniture  Weight of the ſhip at her light water | 50 124 |
| mark | 653 |
| Weight of the ſhip at her load water |
| mark | 637 1670 |
| Real burthen | 984 1670 |
| By the common rule. |
| Keel for tonnage | 105 f. |
| Extreme breadth | 38 |
| Product | 3999 |
| Half extreme breadth > | 19 |
| 94)75810 | |
| Tonnage | 806 1096 |

|  |  |
| --- | --- |
| Tonnage  Real tonnage | 806 1096 984 1670 |
| Difference - - | 178 574 |
| 3. ***A Cutter.*** |  |
| Length of the keel for tonnage  Extreme breadth | 58 f. 0 in. 29 0 |
| Launching draught of water abaft | 5 10  9 8 |
| Load draught of water  The weight of the cutter at her launch­ing  Weight of the furniture | 9 0  12 0  147 t. 640lbs. 9 199 |
| Weight of the cutter at her light wa­ter mark  Weight of the cutter at her load water mark | 156 839  266 1970 |
| Real burthen | 110 1131 |
| By the common rule. Keel for tonnage  Extreme breadth | 58 f.  29 |
| Product  Half extreme breadth | 1682  14 1/2 |
| 94)24389 | |
| Tonnage by the common rule  Real tonnage | 259 1024 110 1131 |
| Difference | 148 2133 |

The impropriety of the common rule is hence manifeſt, as there can be no dependence on it for aſcertaining the tonnage of veſſels.

We ſhall now ſubjoin the following experimental method of finding the tonnage of a ſhip.

Conſtruct a model agreeable to the draught of the propoſed ſhip, to a ſcale of about one-fourth of an inch to a foot, and let the light and load water lines be marked on it. Then put the model in water, and load it until the ſurface of the water is exactly at the light water line ; and let it be ſuſpended until the water drains off, and then weighed. Now since the weights of ſimilar bodies are in the triplicate ratio of their ho­mologous dimenſions, the weight of the ſhip when light is, therefore, equal to the product of the cube of the number of times the ſhip exceeds the model by the weight of the model, which is to be reduced to tons. Hence, if the model is conſtructed to a quarter of an inch ſcale, and its weight expreſſed in ounces ; then to the constant logarithm 0.4893556, add the logarithm of the weight of the model in ounces, and the ſum will be the logarithm of the weight of the ſhip in tons.

Again, the model is to be loaded until the ſurface of the water coincides with the load water line. Now the model being weighed, the weight of the ſhip is to be found by the preceding rule : then the difference be­tween the weights of the ſhip when light and loaded is the tonnage required.