It will alſo be worth while to add the following ex­act rule of Mr Parkins, who was many years foreman of the ſhipwrights in Chatham dockyard.

*1. For Men of War.*

Take the length of the gun-deck from the rabbet of the ſtem to the rabbet of the ſtern-poſt. 2/2 3/4 of this is to be aſſumed as the *length for tonnage, =* L.

Take the extreme breadth from outſide to outſide of the plank ; add this to the length, and take 1/23 of the ſum ; call this the *depth for tonnage, =* D.

Set up this height from the limber ſtrake, and at that height take a breadth alſo from outſide to outſide of plank in the timber when the extreme breadth is found, and another breadth in the middle between that and the limber ſtrake ; add together the extreme breadth and theſe two breadths, and take 1/3 of the ſum for the breadth for tonnage, = D.

Multiply L, D, and B together, and divide by 49. The quotient is the burthen in tons.

The following proof may be given of the accuracy of this rule. Column 1. is the tonnage or burthen by the king’s meaſurement ; col. 2. is the tonnage by this rule ; and, col. 3. is the weight actually received on board theſe ſhips at Blackſtakes :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Victory | 100 guns. | 2162 | 1839 | 1840 |
| London | 90 | 1845 | 1575 | 1677 |
| Arrogant | 74 | 1614 | 1308 | 1314 |
| Diadem | 64 | 1369 | 1141 | 965 |
| Adamant | 50 | 1044 | 870 | 886 |
| Dolphin | 44 | 879 | 737 | 758 |
| Amphion | 32 | 667 | 554 | 549 |
| Daphne | 20 | 429 | 329 | 374 |

2. Far Ships oſ Burthen.

Take the length of the lower deck from the rabbet of the ſtem to the rabbet of the ſtern-poſt ; then 3/3 1/2 of this is the length for tonnage, = L.

Add the length of the lower deck to the extreme breadth from outſide to outſide of plank ; and take 3/55 of the ſum for the depth for tonnage, = D.

Set up that depth from the limber ſtrake, and at this height take a breadth from outſide to outſide. Take another at 2/3 of this height, and another at 1/3 of the height. Add the extreme breadth and theſe three breadths, and take the 4th of the ſum for the breadth for tonnage, = B.

Multiply L, D, and B, and divide by 36 2/3. The quotient is the burthen in tons.

This rule reſts on the authority of many ſuch trials, as the following :

|  |  |  |  |
| --- | --- | --- | --- |
|  | King’s  Measm. | Rule. | Actually  recd. on bd. |
| Northington Indiaman | 676 | 1053 | 1064 |
| Granby Indiaman | 786 | 1179 | 1179 |
| Union coallier | 193 | 266 | 289 |
| Another coallier | 182 | 254 | 2-77 |

Chap. X. Of the Scale of Solidity.

By this ſcale the quantity of water diſplaced by the bottom of the ſhip, for which it is conſtructed, anſwering to a given draught of water is eaſily obtained ; and

alſo the additional weight neceſſary to bring her down to the load water line.

In order to conſtruct this ſcale for a given ſhip, it is neceſſary to calculate the quantity of water diſplaced by the keel, and by that part of the bottom below each water line in the draught. Since the areas of the ſeveral water lines are already computed for the eighty gun ſhip laid down in Plates CCCCLX. and CCCCLXI. the contents of theſe parts may hence be eaſily found for that ſhip, and are as follow.

|  |  |  |  |
| --- | --- | --- | --- |
| *Draught of water.* | | *Water diſplaced in* | |
| *Cubic feet.* | *tons. lbs.* |
| Keel and false keel | 2 f. 3 in. | *660.9* | *2*1 1855 |
| Diſt. bet. keel and 5th w. line | 4 1 | 8583.1 3/4 | 283 1233 |
| Sum | 6 4 | 9243. 10 3/4 | 305 848 |
| Diſt. 5th and 4th w. line | 4 1 | 18657.81/41/8 | 6l6 828 |
| Sum | 10 5 | 27901.7 4/47/8 | 921 1676 |
| Diſt. 4th and |  |  |
| 3d w. line | 4 1 | 23574.6 1/47/8 | 7781795 |
| Sum | 14 6 | 51476.21/4 | 1700 1231 |
| Diſt. 3d and |  |  |
| 2d w. line | 4 1 | 27812.1 3/24 | 918 1775 |
| Sum | 18 7 | 79288.3 2/21/4 | 2619 766 |
| Diſt. 2d and | *4* | 1033 1218 |
| 1 ſt w. line | 4 | 31285.7 1/29/4 |
| Sum | 22 8 | 110573.111/4 | 3652 1984 |

Conſtruct any convenient ſcale of equal parts to re­preſent tons, as ſcale n⁰ 1. and another to repreſent feet, as n⁰ 2.

Draw the line AB (fig. 36 ) limited at A, but produced indefinitely towards B. Make AC equal to the depth of the keel, 2 feet 3 inches from ſcale n' 2, and through C draw a line parallel to AB, which will re­preſent the upper edge oſ the keel ; upon which ſet off Cc equal to 21 tons 1855 lbs, taken from ſcale n⁰ 1. Again, make AD equal to the diſtance between the lower edge of the keel and the fifth water line, namely, 6 feet 4 inches, and a line drawn through D parallel to AB will be the repreſentation of the lower water line ; and make D *b* equal to 305 tons 848 lbs, the correſponding tonnage. In like manner draw the other wa­ter lines, and lay off the correſponding tonnages ac­cordingly : then through the points A, *c, b, e, ſ, g,.h,* draw the curve A c b e f g h Through *h* draw *h* B perpendicular to AB, and it will be the greateſt limit of the quantity of water expreſſed in tons diſ­placed by the bottom of the ſhip, or that when ſhe is brought down to the load water line. And ſince the ſhip diſplaces 1788 tons at her light water mark, take therefore that quantity from the ſcale no 1, which being laid upon AB from A to K, and KL drawn perpendicular to AB, will be the repreſentation of the light water line for tonnage. Hence the ſcale will be completed