Table IL

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Length of Load Water-line.** | **Breadth, extreme, at ditto.** | **Depth from ditto to lower edge of Keel Rabbet.** | **Draught of Water.** | | **Displacement, in Tons.** | **Centre of Gravity of ditto before the middle of Load Water-line.** | **Displacement before Centre of Gravity.** | **Displacement abaft Centre of Gravity.** | **Difference Before and After Bodies.** | **Distance of Centre of Gravity of Fore-Body from Centre of Gravity of the Displacement.** | **Distance of ditto of after-body from ditto.** |
| **Forward.** | **Aft.** |
|  | **Feet. In.** | **Feet. In.** | **Feet.** | **Feet. In.** | **Feet. In.** | **Tone.** | **Feet.** | **Cub. Ft.** | **Cub. Ft.** | **Cub. Ft.** | **Feet.** | **Feet.** |
| Rodney, 92 guns | 204 0 | 54 43/4 | 21∙27 | 23 0 | 24 11/2 | 41653/4 | 2∙445 | 73550 | 72250 | 3714 | 40 99 | 41∙72 |
| Queen, 110 guns | 202 5 | 59 81/2 | 22∙91 | 22 51/4 | 23 51/4 | 44823/4 | 1∙843 | 79320 | 77574 | 499 | 40∙51 | 41∙42 |
| Vengeance, 84 guns | 194 2 | 52 21/2 | 20∙655 | 21 74 | 23 11/2 | 3387 | 3∙672 | 59856 | 58702 | 33 0 | 37∙09 | 37∙82 |
| **Vengeance, 84 guns** | 194 111/2 | 52 21/2 | 21∙825 | 22 1 | 24 10 | 3680 | 2∙467 | 64836 | 63974 | 24.1 | 37∙74 | 38∙25 |
| Winchester, 52 guns | 172 7 | 44 3 | 191 | 20 1 | 21 2 | 2279 | 1∙662 | 40180 | 39602 | 16∙5 | 33 54 | 34 03 |
| \*President, 52 guns | 172 10 | 44 11 | 185 | 19 1 | 21 8 | 21231/2 | 4∙397 | 38059 | 36262 | 51'4 | 32∙95 | 34∙58 |
| Seringapatam, 46 guns | 159 4 | 41 0 | 16 05 | 16 81/4 | 18 21/4 | 1531 | 2\*84 | 27226 | 26366 | 24·6 | 3∣∙56 | 32·58 |
| Inconstant, 36 guns | 160 0 | 45 0 | 1800 | 19 5 | 19 5 | 1862 | 2 79 | 32975 | 32192 | 22·4 | 30·74 | 31·49 |
| Minerva, 46 guns | 152 9 | 40 11/4 | 16·32 | 17 6 | 18 6 | 1428 | 2'38 | 26381 | 23949 | 69·4 | 25·103 | *27*·*688* |
| Sapphire, 26 guns | 120 0 | 34 0 | 13·42 | 14 11 | 15 51 | 770 | 1·76 | 13636 | 13330 | 8·6 | 23·22 | 23\*75 |
| Imogene, 28 guns | 126 0 | 33 10 | 14·42 | 15 6 | 16 4 | 873 | 2∙17 | 15517 | 15052 | 13∙2 | 24·78 | 25·54 |
| Challenger, 28 guns | 126 11 | 32 81/2 | 151 | 16 7 | 16 7 | 943 | 2·35 | 16730 | 16288 | 12·6 | 24 76 | 25·43 |
| Rover, 18 guns | 109 9 | 34 0 | 1305 | 13 111/2 | 14 111/2 | 563 | 2∙253 | 10017 | 9722 | 8\*4 | 20∙74 | 21·37 |
| Orestes, 18 guns | 111 2 | 31 0 | 12·87 | 13 10 | 14 *7* | 606 | 2485 | 10805 | 10403 | 11·5 | 21∙63 | 22·46 |
| Champion, 18 guns.......... | 110 10 | 31 1 | 12·92 | 14 6 | 14 6 | 615·8 | 1·226 | 10824 | I0732 | 2·66 | 21·94 | 22∙12 |
| Columbine, 18 guns | 102 7 | 33 21 | 13∙4 | 14 41 | 14 103/4 | 524'8 | 4·25 | 9435 | 8933 | 14 3 | 18·79 | 19∙84 |
| Scylla, 18 guns | 97 6 | 30 0 | 11·33 | 10 7 | 14 3 | 421·8 | 1·312 | 7526 | 7239 | 8 2 | 17·91 | 18·88 |
| \*Waterwitch, 10 guns | *88* II | 28 91/2 | 11142 | 10 2 | 14 6 | 330 8 | ·167 | 5804 | 5774 | ·56 | 16·44 | 16 52 |
| Britomart, 10 guns | 86 9 | 24 7 | 9·81 | 10 73/4 | 12 33/4 | 278·0 | ·517 | 4920 | 4808 | 3·5 | 16·66 | 17·05 |

**\*The calculations for the ships thus marked are made to the sea-going draughts of water ; for the others, to the draughts of water on the drawings.**

Table III.—*Moments of Sail, of Stability, and of Sail in terms of the Stability, in Ships which have carried their Sail well.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Three-decked Ships.** | | | **Two-decked Ship·.** | | | **Frigates.** | | | **Sloops.** | | | **Brigs of 18 Guns.** | | | **Brigs of 10 Guns.** | | |
| **Moments** | | | **Moments** | | | **Moments** | | | **Moments** | | | **Moments** | | | **Moments** | | |
| of Sail. | **of Stability at 10o Inclination.** | of Sail in terms of Stability. | of Sail. | **of Stability at 10° Inclination.** | **of Sail in terms of Stability.** | **of Sail.** | **of Stability at 10o Inclination.** | **of Sail in terme of Stability.** | **of Sail.** | **of Stability at 10o Inclination.** | of Sail in terms of Stability. | of Sail. | **of Stability at 10° Inclination.** | of Sail in terms of Stability. | of Sail. | **of Stability at 10o Inclination.** | **of Sail in terms of Stability.** |
| 2,632,121 | **Ton\*.**  3452 | 762 | 1,750,165 | **Tons.**  2280 | **767** | 1,276,577 | **Tone.**  1647 | **775** | 554,484 | **Tone.**  547 | 1013 | 442,413 | **Tone.**  **409** | 1081 | 247,645 | **Tons.**  207 | **1196** |

*Description of several Mechanical Methods of Designing the Body of a Ship.*

The following mechanical methods of designing the forms of midship sections, and of ships' bodies, have been publish­ed in different English and French works on naval archi­tecture. Some of these are for forming the midship section alone ; others are for deducing the successive sections for­ward and abaft from a given midship section. Such me­thods of endeavouring to compensate for the absence of more correct principles on which to found the design of a ship, were rendered necessary whenever the vessel to be built was of too large a size to admit of being conveniently put up by the aid of the eye alone ; and consequently al­most every merchant-builder is in possession of some such empirical system, to enable him to form a design for a ship. Whether the ship built after the design so formed, will prove to be possessed of good or of bad qualities, does not generally enter into the consideration, excepting in so far as the crude ideas of the inventor of the system may have guided him in forming it. We say the crude ideas, be­cause the builder whose judgment is sound enough to en­able him to arrange facts and classify observations, and whose experience has been extensive enough to have fur­nished him sufficient facts from which to deduce principles, will abandon all such attempts as futile, and will pursue the study of naval architecture in the manner in which alone it can be studied to certain advantage, that is, as an induc­tive science. His success will depend on his fitness for the task.

If all the principles which are involved in the design for a perfect ship were developed, and correct results could be obtained by calculation on every point involved, a system might be formed. A system might also be formed combin­ing all the present knowledge on the subject ; but this is far from desirable; it would necessarily be imperfect, and it would be entailing imperfection on the future.

M. Bouguer, in his *Traité du Navire,* gives four methods which have been used for describing the midship sections of ships. He observes, that in these plans the midship sec­tions are generally formed of arcs of circles ; but that some­times, through the ignorance of the inventors, of the fact, that for two arcs of circles to touch each other without cutting, their centres must be in the straight line which passes through their point of contact, the midship sections which they formed by these arcs had not even the advantage of being curves, but had angles in their contour. He shows how this error may be avoided. The first method he gives