can only be matured by a free and impartial encouragement of the application of the exact sciences to the improvement of naval architecture, and by the total abolition of all laws which can, directly or indirectly, limit the aspirings of the merchant-builders of England in their competition with fo­reigners. The writer of this article believes that England scarcely ever committed a greater error than when she first determined the existence of a law for levying duties ac­cording to tonnage.

We may here advert to a most striking example of the effects of the removal of this check, in the matchless ex­cellence of the yachts of England, and may therefore not unfairly presume, that the same skill which has already ex­alted one class of vessels beyond competition, might, under similar circumstances, attain the same comparative excel­lence for another, and that our merchant-ships may yet be­come as unrivalled as are our yachts. Be the law of ton­nage founded on weight, on bulk, or on dimensions, in each and every case it operates as a check to the most important manufacture of the country. There is evidently nothing so essential to England as that she should possess a large ma­ritime population ; and this can only be insured by the pre­ponderance of her mercantile navy, which, again, must in future be completely dependent on the qualities of the ships that compose it.

It is obvious, that while the effects of a long, and solid, and, we believe, hearty peace, amongst the civilized nations of the world, are to increase the wealth of all other nations as well as our own, and with their wealth to increase their shipping, it becomes a serious national duty on the part of our rulers to frame such laws as may insure to us the van­tage-ground we possessed when peace enabled all alike to start in the race of improvement. That we may have free exercise for our skill, capital, and enterprise, we must not be cramped by absurd laws as to the tonnage and sailing regulations of our ships. These impediments should evi­dently be removed, in order to place us at least upon equal terms with our competitors.

We do not pretend to arrogate to ourselves that com­mand of the seas which was intended by Sir Walter Ra­leigh. The days when fleets were bound to lower topsails at the bidding of a single pennant have, happily for the wellbeing of mankind, long passed away. But we do say that the end and object of all British policy should be to insure such preponderance on the seas, that if, amidst the changes which we almost daily see occurring, and which make the possible advent of war no speculative imagining, one should arise to plunge Europe again into strife, Eng­land may not be found wanting in practised seamen. This, we believe, can only be assured by her possessing a mercan­tile navy, composed of ships the good qualities of which will insure for them a large proportionate share of the carrying trade of the world. In short, we believe, that, to insure for our military navy, in times of war, successes triumphant as heretofore over every sea, it is essential that our mercantile navy should, in these times of peace, crowd every port.

It is in order to advance this cause that we shall endea­vour to set in a clear point of view the several difficulties which occur in the study of naval architecture ; and we feel no doubt whatever, that if the principles of construction which we shall endeavour to explain be duly attended to, and the study followed up in earnest, the results will prove their correctness, and that the mercantile navy of England will become as unrivalled in its excellencies as are almost all the other productions of the skill, talent, and enterprise of this favoured land.

*Rise and Progress of Naval Architecture among the Na­tions of Antiquity.*

In tracing the progress of naval architecture among the nations of antiquity, in order to connect it with its advance

in more modern times, we shall cite the chronological di­visions adopted by that indefatigable investigator Charnock, in his valuable History of Marine Architecture, because they present a very succinct idea of the probable rise, pro­gress, decline, and revival of the art, and therefore offer a valuable guide for investigation. It would not be consist­ent with the purpose of this article to enter into the detail that would be necessary to ascertain the state of naval ar­chitecture during the periods embraced in each of the sec­tions he has assigned to this subject. We shall confine our­selves to the statement of some few facts, collected from various authors, in illustration of the probable size and na­ture of the shipping of the ancient world. We shall also endeavour to trace what little is known of the rude vessels which, during the darkness of the middle ages, bore the marauders of the northern nations on their predatory ex­cursions ; in which they carried desolation and misery throughout the coasts of Europe, and, while they rooted out the last relics of ancient civilization, laid the foundations of empires which were destined, in their turn, to civilize the world. With Cliarnock’s sixth section, inclusive perhaps of some few years at the close of his fifth, the naval history of Britain commences ; and during the period embraced between that date and the present time we must gradually become more diffuse in our detail.

Charnock divides maritime history into seven sections. The first comprehends the time previous to the foundation of Rome, until which, he says, all history is founded on sur­mise. The second section comprises a period somewhat less obscure, in which the collateral testimony of various authors may be examined and compared ; and therefore there certainly appears less difficulty in ascertaining facts. It ex­tends from the foundation of Rome to the destruction of her rival Carthage. The termination of the third is at the conversion of the republic into an empire, an era when the want of naval enemies to contend with rendered the main­tenance of a fleet, as connected with the prosperity and safety of the state, a consideration not only of secondary, but immaterial consequence. The death of Charlemagne ends the fourth epoch. The fifth extends from this period to the discovery of the mariner’s compass. The sixth ends with the discovery of cannon ; and their adaptation to naval warfare commences the seventh epoch.

It will avoid much useless repetition if we premise our investigations on the state of ship-building among the na­tions of antiquity, by the observation that their fleets, whe­ther for war or for commerce, appear to have consisted al­most entirely of vessels whose principal mode of propulsion was by the use of oars. It would be foreign to the object of the present article to enter into the useless and perplexing, though most enticing question, as to how those oars were applied in the trireme, quadrireme, and quinquireme, nay, on the authority of Plutarch, even to the extent of fifty distinct banks of oars. It is possible to conceive many methods in which the benches of the biremes, and even of the tri­remes, may have been disposed, which would enable the oars to be plied with ease and advantage. But the vast combination implied by the fifty banks of the galley of Pto­lemy Philopater has as yet received no solution, unless it may be that suggested by Mr Holwell in his Essay on the War Galleys of the Ancients, which we shall therefore, in the absence of all certain data, adopt. He imagines that the banks of oars must have been arranged obliquely up the sides of the vessel, as many oars in each bank as would ad­mit of the highest being rowed with facility ; then each ad­ditional bank would only require additional length in the vessel. Thus the galley of Ptolemy Philadelphus might have had forty, and that of Ptolemy Philopater fifty, of these oblique ascents of oars, and yet need not necessarily have been higher out of the water than the ordinary quinquireme. It should be stated, that the triremes seem to have been the