

believing that they possessed much practical and experimental knowledge of this subject. It was not, perhaps, possessed by them in a strict and systematic form, as it is now taught by our mathematicians; but the master-builders, in their dock-yards, did undoubtedly exercise their genius in comparing the forms of their finest ships, and in marking those circumstances of form and dimension which were *in fact* accompanied with the desirable properties of a ship, and thus framing to themselves maxims of naval architecture in the same manner as we do now. For we believe that our naval architects are not disposed to grant that they have profited much by all the labours of the mathematicians. But the ancients had not made any great progress in the physicomathematical sciences, which consist chiefly in the application of calculus to the phenomena of nature. In this branch they could make none, because they had not the means of investigation. A knowledge of the motions and actions of fluids is accessible only to those who are familiarly acquainted with the fluxionary mathematics; and without this key there is no admittance. Even when possessed of this guide, our progress has been very slow, hesitating, and devious; and we have not yet been able to establish any set of doctrines which are susceptible of an easy and confident application to the arts of life. If we have advanced farther than the ancients, it is because we have come after them, and have profited by their labours, and even by their mistakes.

Sir Isaac Newton was the first (as far as we can recollect) who attempted to make the motions and actions of fluids the subject of mathematical discussion. He had invented the method of fluxions long before he engaged in his physical researches; and he proceeded in these *suâ mathesi facem præferente*. Yet even with this guide he was often obliged to grope his way, and to try various bye-paths, in the hopes of obtaining a legitimate theory. Having exerted all his powers in establishing a theory of the lunar motions,