

Thomas Hobbes

SIX LESSONS

TO THE

PROFESSORS OF THE MATHEMATICS,

ONE OF GEOMETRY, THE OTHER OF ASTRONOMY,

IN THE CHAIRS SET UP BY THE NOBLE AND LEARNED

SIR HENRY SAVILE, IN THE UNIVERSITY

OF OXFORD.

TO THE RIGHT HONOURABLE
HENRY LORD PIERREPONT,
VISCOUNT NEWARK, EARL OF KINGSTON, AND
MARQUIS OF DORCHESTER.

MY MOST NOBLE LORD,
NOT knowing on my own part any cause of the favour your Lordship has been pleased to express towards me, unless it be the principles, method, and manners you have observed and approved in my writings ; and seeing these have all been very much reprehended by men, to whom the name of public professors hath procured reputation in the university of Oxford, I thought it would be a forfeiture of your Lordship's good opinion, not to justify myself in public also against them, which, whether I have sufficiently performed or not in the six following Lessons addressed to the same professors, I humbly pray your Lordship to consider. The volume itself is too small to be offered to you as a present, but to be brought before you as a controversy it is perhaps the better for being short. Of arts, some are demonstrable, others indemonstrable ; and demonstrable are those the construction of the subject whereof is in the power

of the artist himself, who, in his demonstration, does no more but deduce the consequences of his own operation. The reason whereof is this, that the science of every subject is derived from a pre-cognition of the causes, generation, and construction of the same; and consequently where the causes are known, there is place for demonstration, but not where the causes are to seek for. Geometry therefore is demonstrable, for the lines and figures from which we reason are drawn and described by ourselves; and civil philosophy is demonstrable, because we make the commonwealth ourselves. But because of natural bodies we know not the construction, but seek it from the effects, there lies no demonstration of what the causes be we seek for, but only of what they may be.

And where there is place for demonstration, if the first principles, that is to say, the definitions contain not the generation of the subject, there can be nothing demonstrated as it ought to be. And this in the three first definitions of Euclid sufficiently appeareth. For seeing he maketh not, nor could make any use of them in his demonstrations, they ought not to be numbered among the principles of geometry. And Sextus Empiricus maketh use of them (misunderstood, yet so understood as the said professors understand them) to the overthrow of that so much renowned evidence of geometry. In that part therefore of my book where I treat of geometry, I thought it necessary in my definitions to express those motions by

which lines, superficies, solids, and figures, were drawn and described, little expecting that any professor of geometry should find fault therewith, but on the contrary supposing I might thereby not only avoid the cavils of the sceptics, but also demonstrate divers propositions which on other principles are indemonstrable. And truly, if you shall find those my principles of motion made good, you shall find also that I have added something to that which was formerly extant in geometry.

For first, from the seventh chapter of my book *De Corpore*, to the thirteenth, I have rectified and explained the principles of the science; *id est*, I have done that business for which Dr. Wallis receives the wages. In the seventh, I have exhibited and demonstrated the proportion of the parabola and parabolasters to the parallelograms of the same height and base; which, though some of the propositions were extant without that demonstration, were never before demonstrated, nor are by any other than this method demonstrable.

In the eighteenth, as it is now in English, I have demonstrated, for anything I yet perceive, equation between the crooked line of a parabola or any parabolaster and a straight line.

In the twenty-third I have exhibited the centre of gravity of any sector of a sphere.

Lastly, the twenty-fourth, which is of the nature of refraction and reflection, is almost all new.

But your Lordship will ask me what I have done in the twentieth, about the quadrature of