only shews, that if there be nothing concerned in the communication but pure inertia, the sum-total of the motions of the particles, estimated in the direction of the bodies motion, or that of the stream, will be in the duplicate ratio of the velocity. It was therefore of importance to show that this part of the theory was just. To do this, we had to consider the effect of every circumstance which could be combined with the inertia of the fluid. All these had been foreseen by that great man, and are most briefly, though perspicuously, mentioned in the last scholium to prop. 36. B. II.

2. It appears, from a comparison of all the experiments, that the impulses and resistances are very nearly in the proportion of the surfaces. They appear, however, to increase somewhat faster than the surfaces. The Chevalier Borda found that the resistance, with the same velocity, to a surface of

$$\left.\begin{matrix} 9 \text{ inches} \\ 16 \\ 36 \\ 81 \end{matrix}\right\} \text{ was } \left\{\begin{matrix} 9 \\ 17{,}535 \\ 42{,}750 \\ 104{,}737 \end{matrix}\right\} \text{ instead of } \left\{\begin{matrix} 9 \\ 16 \\ 36 \\ 81 \end{matrix}\right.$$

The deviation in these experiments from the theory increases with the surface, and is probably much greater in the extensive surfaces of the sails of ships and wind-mills, and the hulls of ships.

3. The resistances do by no means vary in the duplicate ratio of the sines of the angles of incidence.

As this is the most interesting circumstance, having a chief influence on all the particular modifications of the resistance of fluids; and as on this depends the whole theory of the construction and working of ships, and the action of water on our most important machines, and seems most immediately connected with the mechanism of fluids, it merits a very particular consideration. We cannot do a greater service than by rendering more generally known the excellent experiments of the French academy.

Fifteen boxes or vessels were constructed, which were