

with copper. The crown was found to be of the same weight as the gold that was delivered, but the king's suspicions were not silenced. It happened that Archimedes observed, as he descended the steps of a bath, that the level of the water rose in proportion as his body was immersed. The facts we have stated, and their application to the royal question, immediately suggested themselves to his mind, and in the moment of joy he ran into the streets of the city, crying, I have found it! I have found it! There is, perhaps, no period in the life of a philosopher so precious and ecstatic as that in which he makes a grand discovery; the variety of applications to which the principle may be applied, and the consciousness of the preservation of his name and exertions, rush through his mind, awakening every hope that he had indulged in the hours of retirement and complacency. Many had observed the fact which so excited Archimedes, but none had perceived the principles dependant upon it, or the manner in which it could be applied.

The theory of sinking and floating bodies is the immediate consequence of the two facts we have mentioned. If the weight of the fluid that is displaced be greater than the weight of the body, it will float; if less, it will sink; and if they be equal, the body will remain in equilibrio. A piece of metal sinks in water, because its weight is always greater than that of the fluid it displaces; and a cork floats, because it is less. So also bodies in the atmosphere, and in all other gases, lose part of their weight, equal to the weight of the volume of fluid they displace. It will be readily understood that these principles embody the theory of balloons.

#### BALLOONS.

The wish to navigate the atmosphere, and its practicability, seem to have been indulged by philosophers from a very early period in the history of science; but no rational plan for the construction of a vessel was proposed until the year 1670, when Francis Lana, a Jesuit, revived the inquiry by the invention of an ingenious balloon. The great difficulty was to form a sailing vessel sufficiently light to float in the air, and at the same time to support its pressure. Lana proposed to attach to a car four large exhausted globes, which would render the apparatus so light, that the aeronaut might be able with a sail to navigate the lower strata of the atmosphere.