I. A Bridge is a structure for sustaining the weights of carriages and animals in their transit over a stream, gulf, or valley.

Bridges are built of various plans and dimensions, according to the circumstances and objects of their erection. My present purpose is, after a few remarks upon the general nature and principles of Bridges, to attempt some analyses and comparisons of the respective qualities and merits of various general plans, with a view of deducing practical results as to a judicious and economical choice and application of materials in the construction of those important erections.

II. The force of gravity, on which the weight of bodies depends, acts in vertical lines, and consequently, a body can only be prevented from falling to the earth by a force equal and opposite to that with which gravity acts on the body. This resisting force must not only act vertically upward, but the line of its action must pass through the centre of gravity of the body it sustains. All the forces in the world, acting parallel with, or perpendicular to, the vertical passing through its centre of gravity, could not prevent an ounce ball, (concentrated to the point of its centre of gravity,) from falling to the centre of the earth, unless it were a horizontal force capable of giving the ball a projection, such that the centrifugal tendency should equal or exceed gravity: a kind of force which could never be made available towards preventing people from falling into the water in crossing rivers, consequently of no use in bridge building.