

Several circumstances remain to be noticed respecting the structure and actions of the wings of birds. If we attend to the mode of their articulation with the scapula, we find it producing a motion oblique with regard to the axis of the body, so that the stroke which they give to the air is directed both downwards and backwards; and the bird, while moving forwards, is at the same time supported in opposition to the force of gravity. The different portions of the wing are likewise so disposed as to be contracted and folded together when the wing is drawn up, but fully expanded when it descends in order to strike the air. It is obvious that, without this provision, a great part of the motion acquired by the resistance of the air against the wing in its descent would have been lost by a counteracting resistance during its ascent. The disposition of the great feathers is such that they strike the air with their flat sides, but present only their edges in rising; what is called *feathering the oar* in rowing is a similar operation, performed with the same intention, and deriving its name from this resemblance.

As the inclination of the wing is chiefly backwards, the greatest part of the effect produced by its action is to move the body forwards. Birds of prey have a great obliquity of wing, and are consequently better formed for horizontal progressive motion, which is what they chiefly practise in pursuing their prey, than for a rapid perpendicular ascent. Those birds, on the contrary, which rise to great heights in a direction nearly vertical, such as the *Quail* and the *Lark*, have the wings so disposed as to strike directly downwards, without any obliquity whatsoever. For the same reason, birds rise better against the wind, which, acting upon the oblique surface presented by the wings during their flexion, contributes to the ascent of the body, on the same principle that a kite is carried up into the air when retained in an oblique position. This circumstance is particularly observable in the ascent of birds of prey, whose wings have a great obliquity, and, when fully expanded, present a very large extent of surface.