

hand,* with the analogue of a thumb, called the winglet,† and of a finger.‡ The ten *primary* quill feathers are planted in the hand, and the *secondaries*, varying in number, on the fore-arm, these quill-feathers, being very principal instruments of the wing in flight, are also named the *remiges* or rowers of the vessel. The primary feathers usually vary in length, the external ones being the longest, so as to cause the wing to terminate in a point; those that cover the shoulder are called *scapulars*; and those short ones that cover the base of the wings above and below are called *coverts*.§ Wings usually curve somewhat inwards, are convex above and concave below, and are acted upon by very powerful muscles. Wonderful is the structure of the feathers that compose them, and each is a master-piece of the Divine Artificer. In general it is evident that each has been measured and weighed with reference to its station and function. Every separate feather resembles the bipinnate leaves of a plant; besides the obvious parts, the hollow quill, and solid stem bearded obliquely on both sides with an infinity of little plumes; each of these latter is also formed with a rachis or mid-rib set obliquely with plumelets, resembling hairs, and exactly incumbent on the preceding one, and adhering, by their means, closely to it, thus rendering the whole feather not only very light, but, as it were, air-tight. In the goose the mid-rib of the plumelets of the primary feathers is dilated towards the base into a kind of keel, so that each plumelet at the summit looks like a feather, and at the base like a lamina or blade.

By the use of very fine microscopes of garnet and sapphire, Sir David Brewster succeeded in developing the structure of the plumelets; he discovered a singular spring consisting of a number of slender fibres laid together, which resisted

* Carpus and Metacarpus.

‡ Digitus.

† Alula.

§ Tectrices.