

The hair of different animals, and sometimes even of different parts of the same animal, varies in its shape, texture, and mechanical properties. Sometimes, instead of being cylindrical, the filaments are more or less flattened, striated, deeply grooved, or even beaded. Instead of being solid, they may even be tubular: and they exhibit also the greatest diversity in their length, fineness, tenacity, rigidity, and disposition to curl. All these varieties may be traced to corresponding differences in the form, and the relative actions of the component parts of the bulb, namely, the pulp and its capsule.*

The structure of the organs by which hairs are formed is not easily distinguished, in the ordinary kinds of hair, on account of their minuteness: it is readily seen, however, in the large whiskers of the feline species, and also of the seal, which are subservient to more extended uses than that of merely covering the body, and which are even supplied with nerves, converting them into instruments of a sense of touch.

In the quills of the porcupine a still more complicated organization has been detected. Fig. 33 shows a quill with its bulbous root, detached from the body; and Fig. 34, a transverse section magnified. The bulb itself is contained in a distinct cell, shown at *a*, Fig. 35, which represents a longitudinal section of these organs. This cell contains a portion of fat, in which the numerous vessels supplying its pulp and capsule are imbedded. The bulb is itself surrounded by an outer sheath, *s*, into the cavity of which, *b*, there opens a duct, *d*, proceeding from a small cell or follicle, *f*, lodged in the cellular substance on the outside of the sheath. This upper cell communicates below with another cavity, *c*, containing an unctuous matter. During the formation of the quill this unctuous matter is supplied through that channel, and probably enters as an ingredient in its composition. The capsule of the pulp consists of two mem-

* See F. Cuvier's *Memoir on the Formation of the Quills of the Porcupine*, in the *Nouvelles Annales du Muséum*, I. 429.