

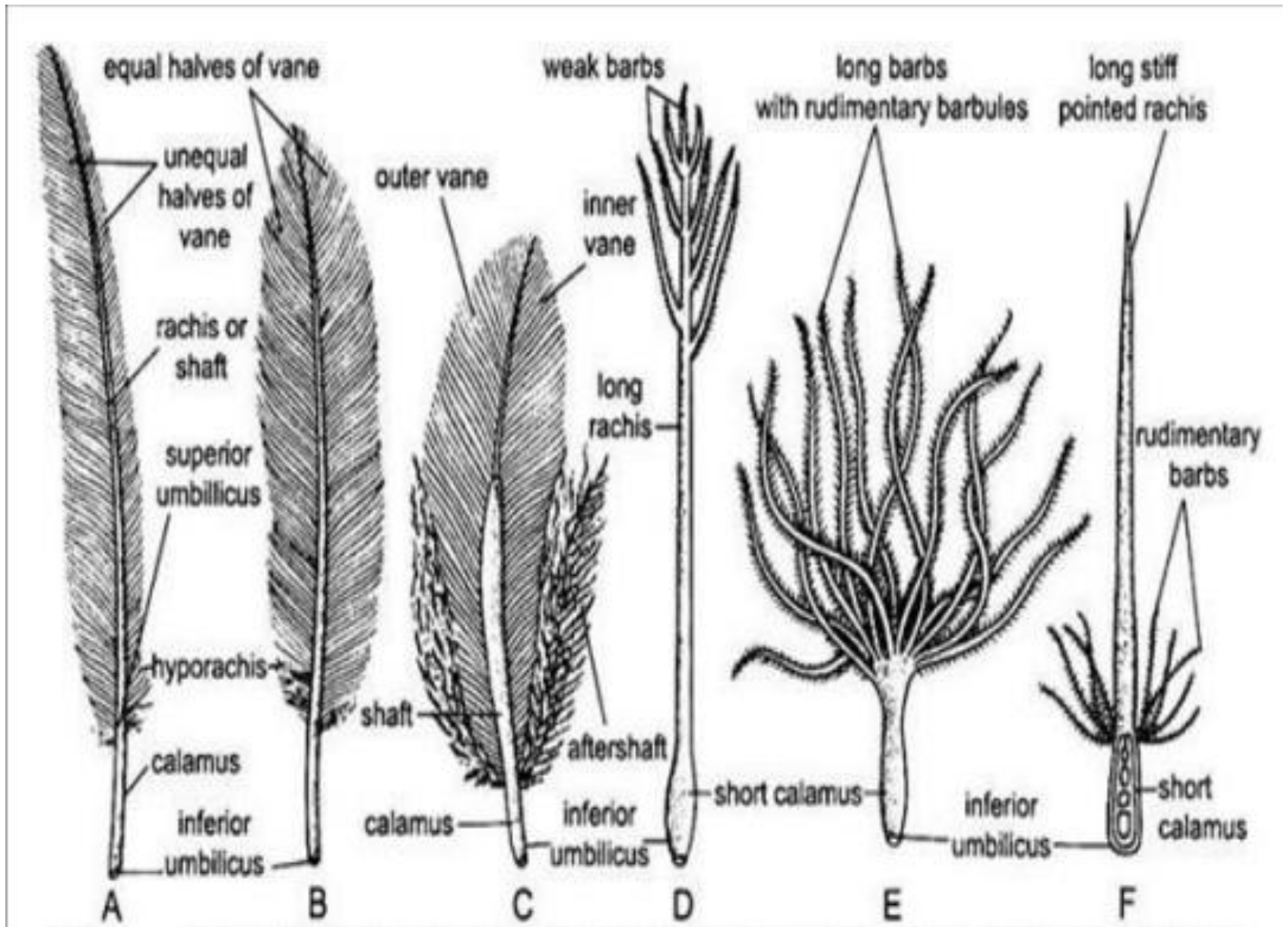
Feather structure and development



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TYPES OF FEATHER

- **Quill Feathers** -> Remiges, Rectrices ,Coverts
- **Contour Feathers**
- **Filoplume Feathers**
- **Down Feathers**
- **Rictal bristles**



membrane vane
or vexillum
(barbs)

rachis or shaft

outer web
or
vane

inner web
or
vane

ventral
umbilical
groove

hyporachis
or aftershaft

superior umbilicus

calamus or quill

dried dermal pulp

inferior umbilicus



Fig- 1

**Pigeon. A typical
feather in ventral
view.**



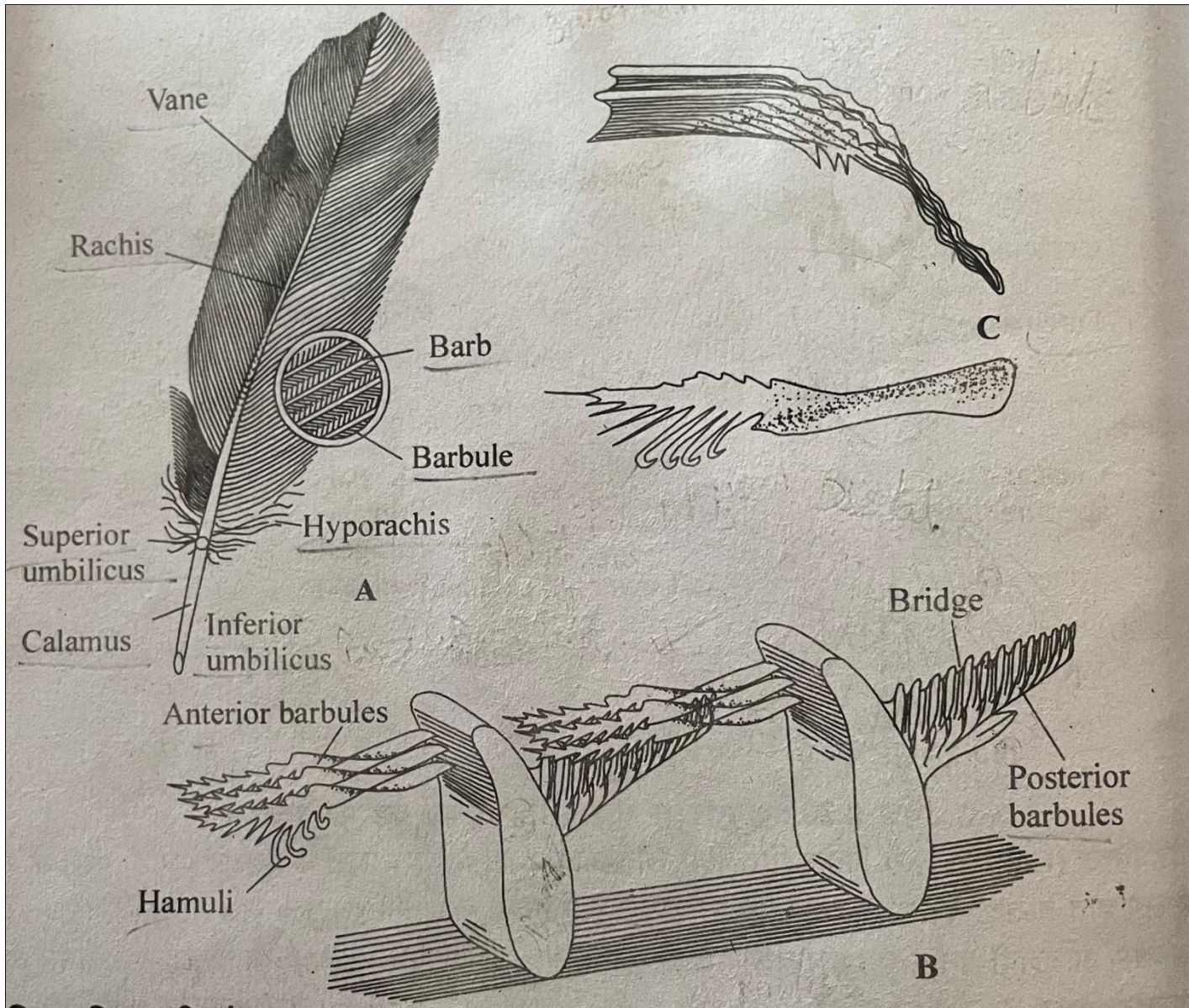
VANE

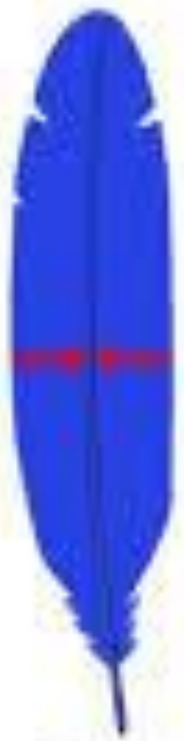
SHAFT

BARBS

AFTERSHAFT

QUILL





Rectrix
(tail)



Remige
(wing)



Contour
feather



Semiplume



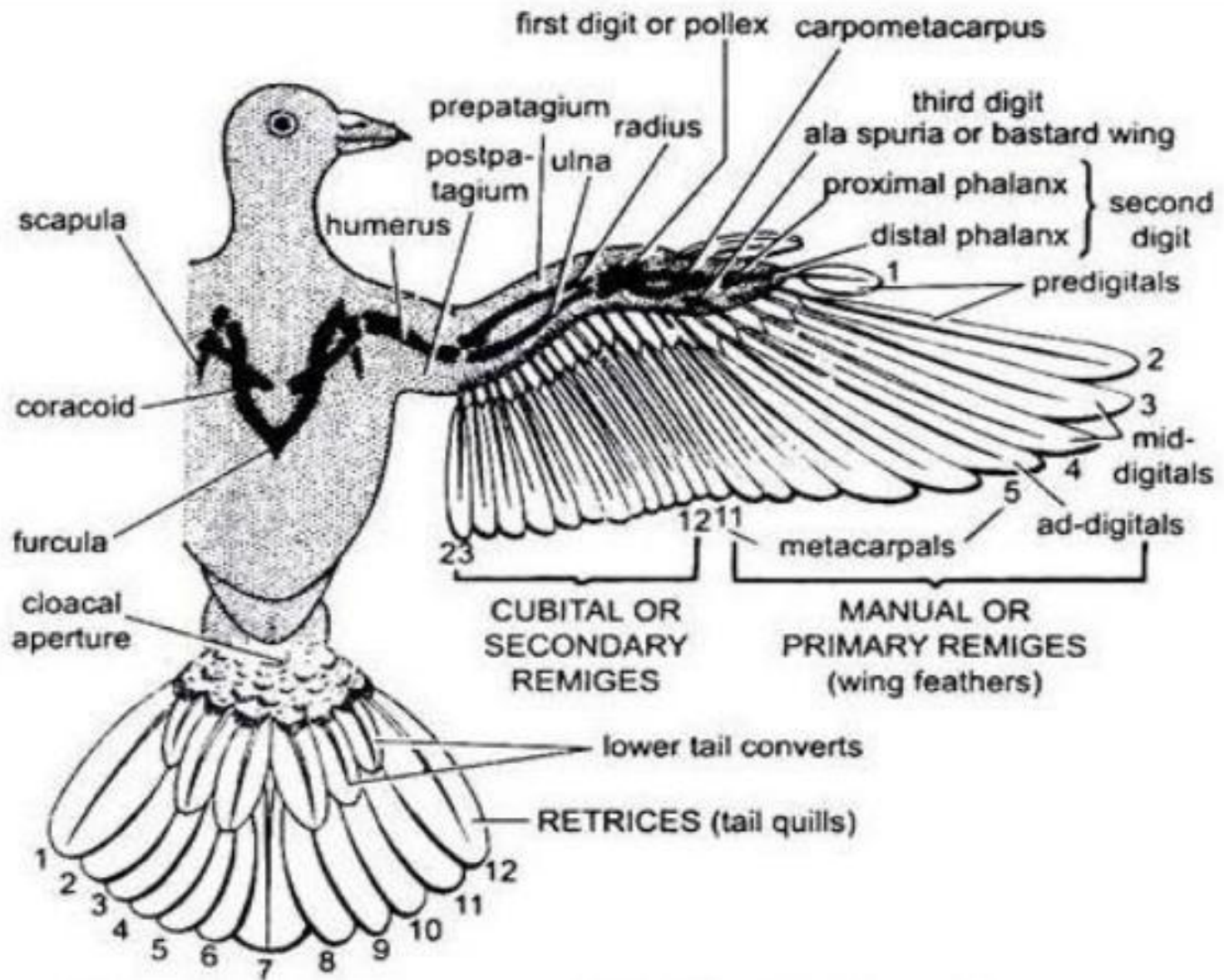
Down



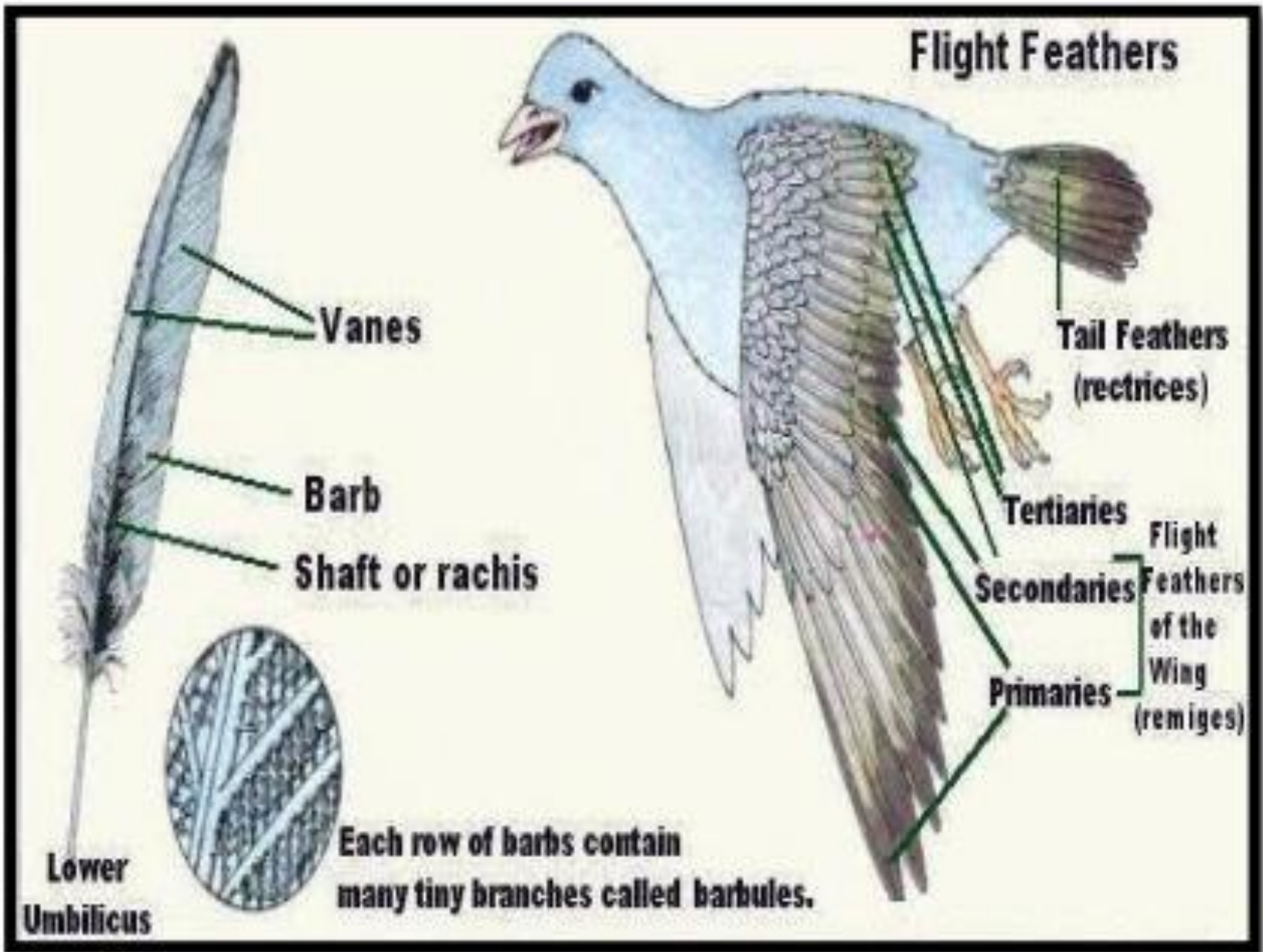
Bristle

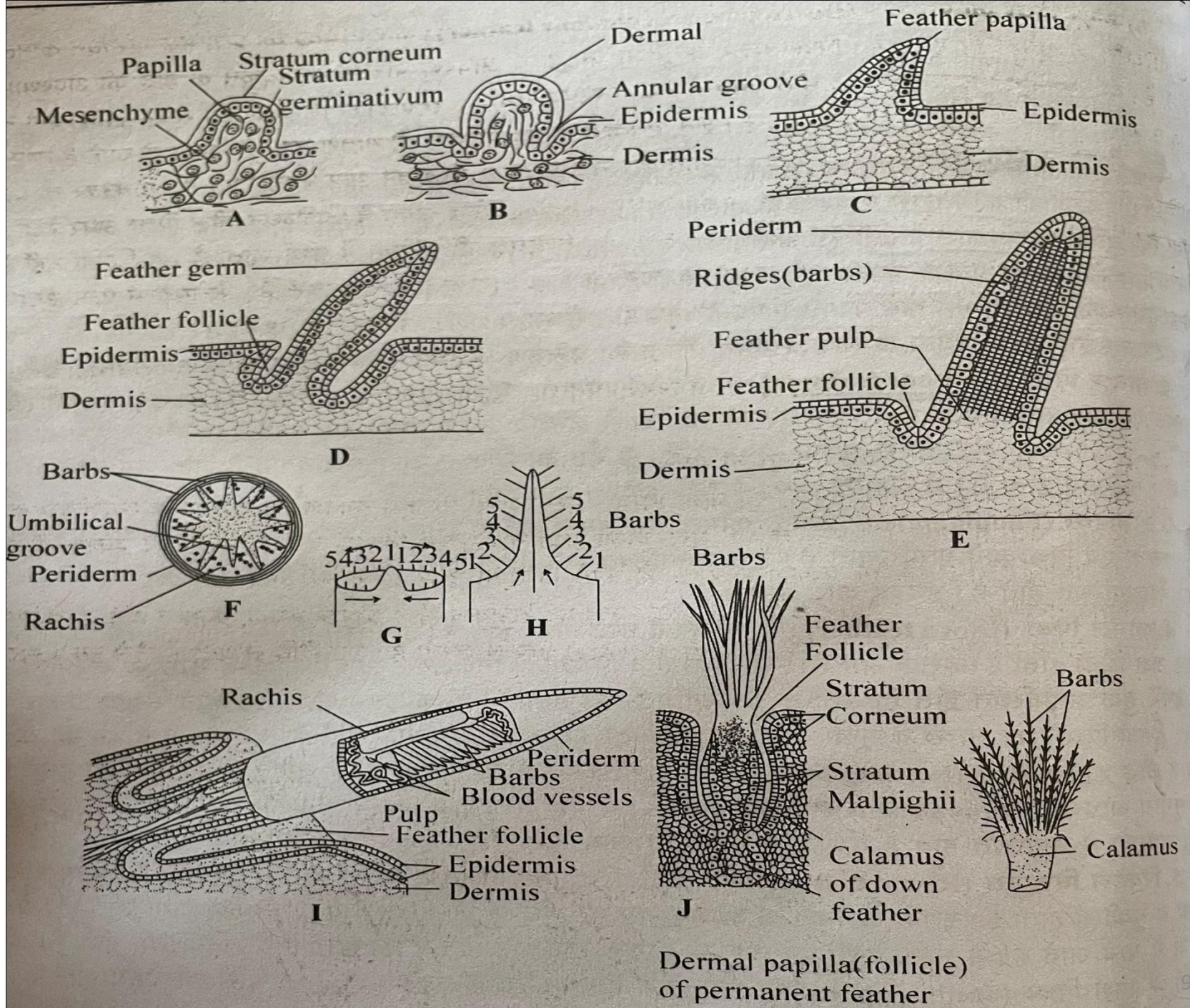


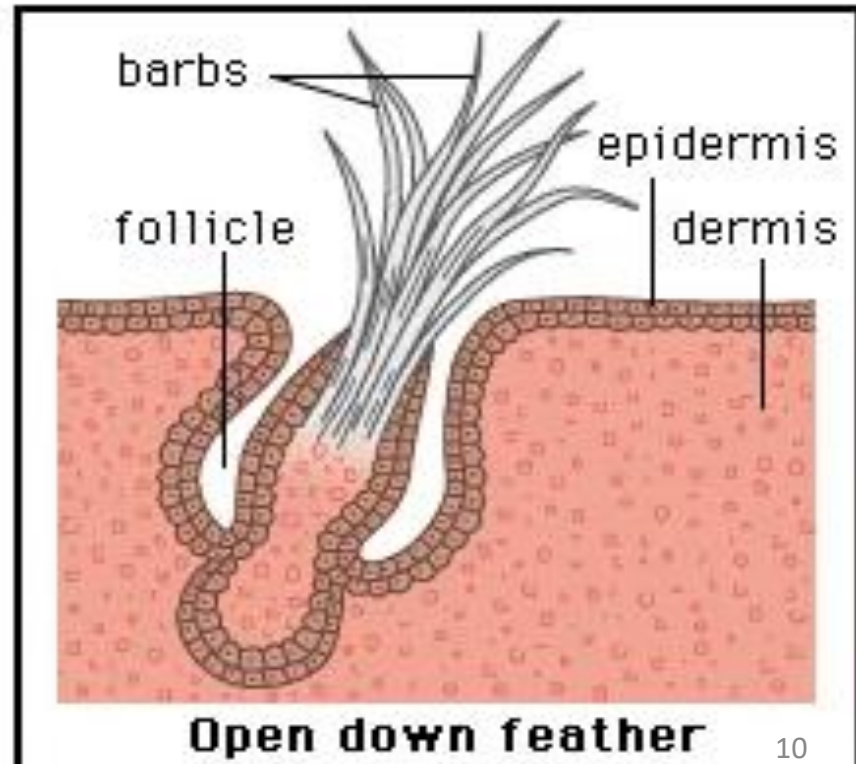
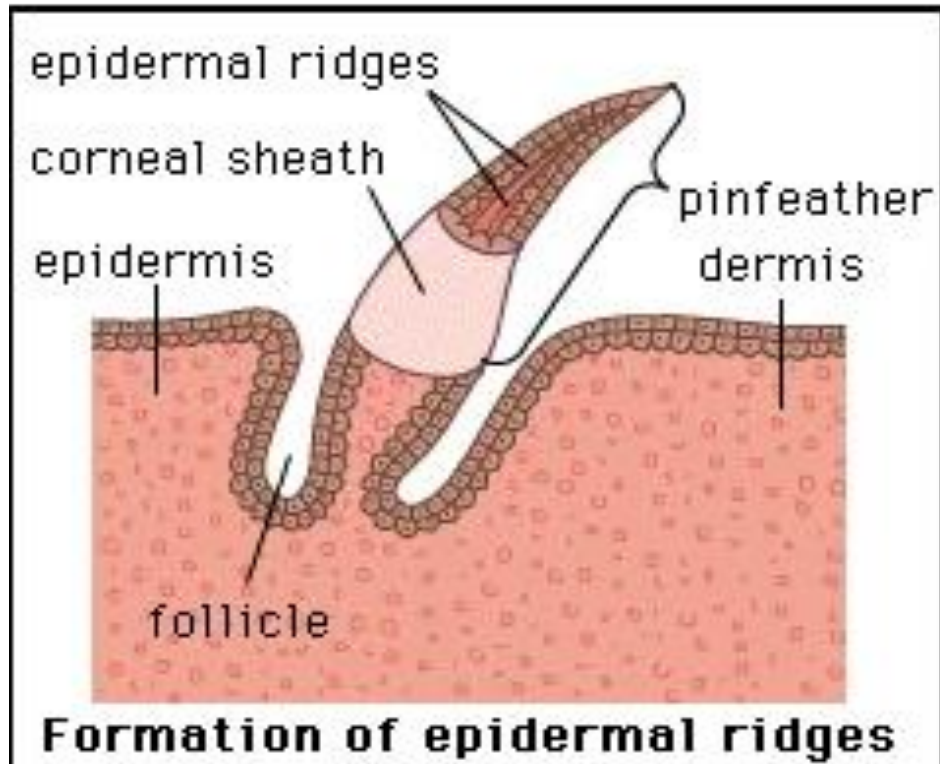
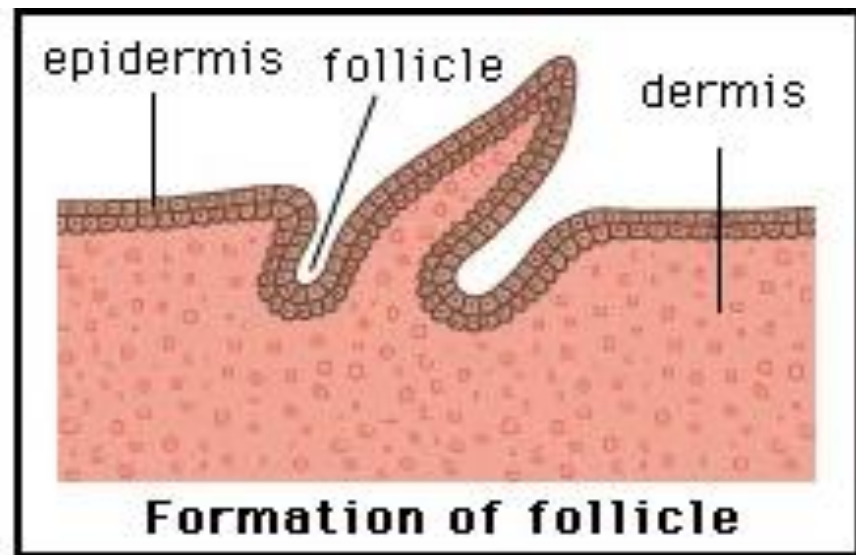
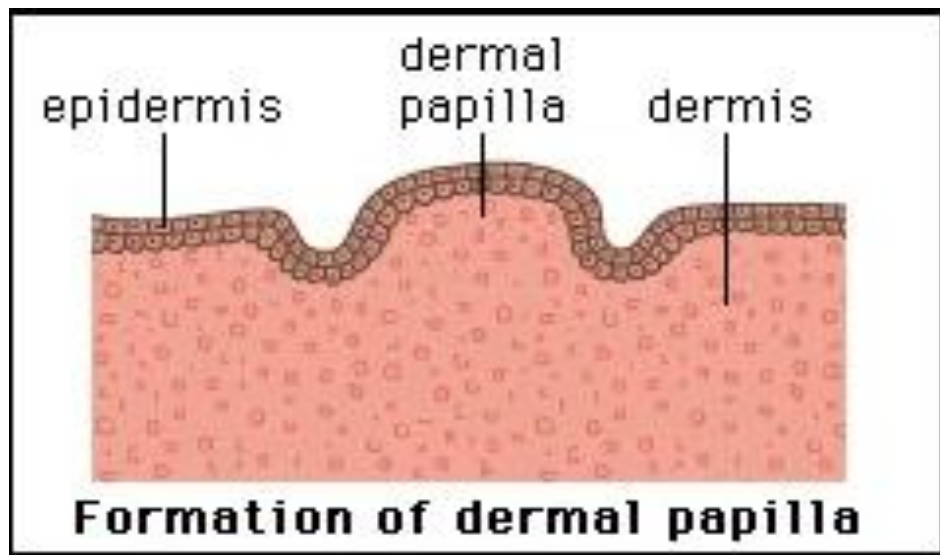
Filoplume

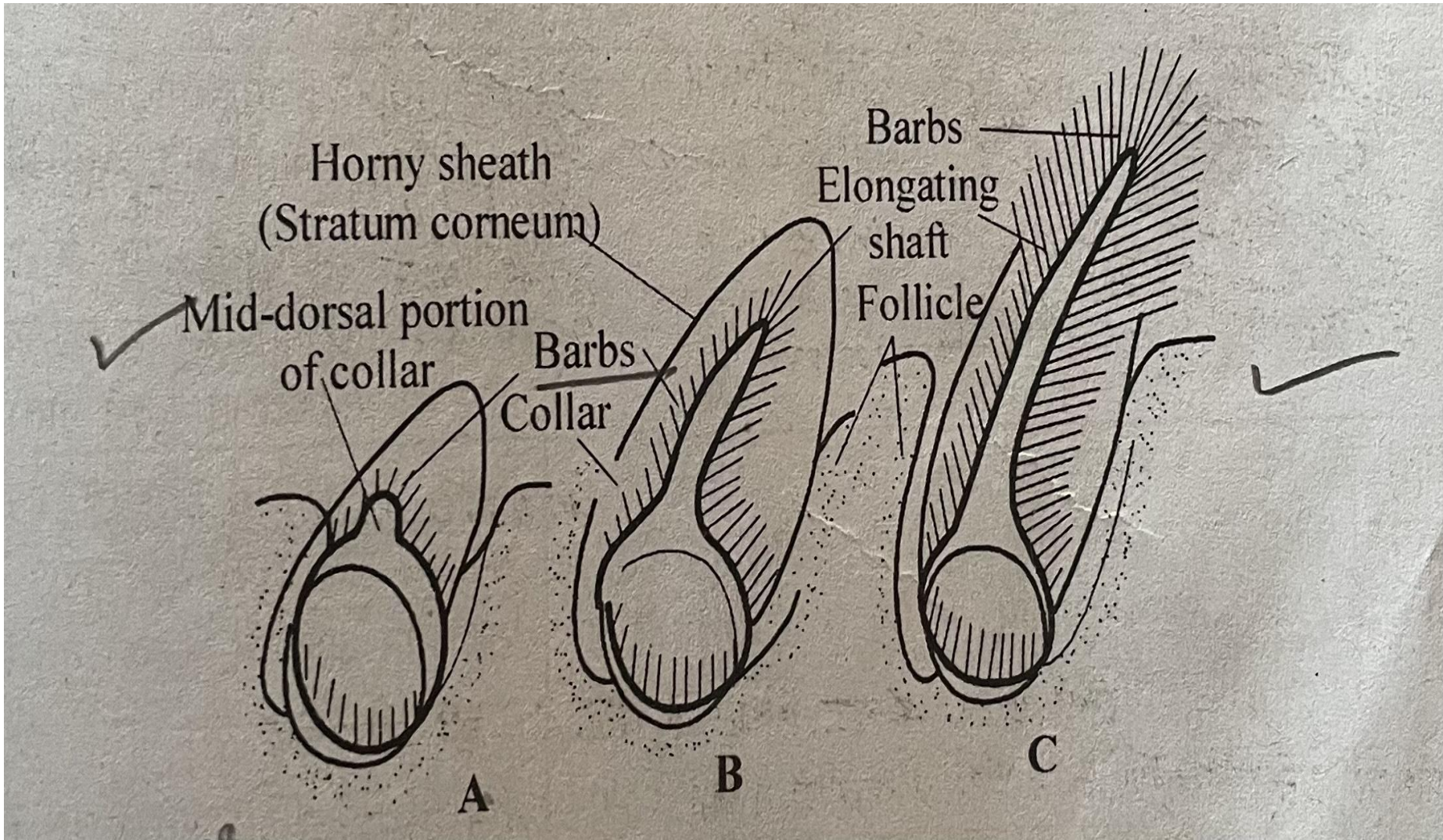


Flight Feathers









What Are Feathers?

Feathers are the soft structures that cover the bodies of the birds. These are the epidermal growths found in birds. These are part of the integumentary system in avians and are the most complex system in vertebrates. Feathers are made of a special type of [protein](#) called beta keratin protein. Feathers are special structures used in flying.

Types of Feathers

There are usually six different types of feathers based on morphology.

Down Feathers - These feathers are very soft due to the absence of interlocking barbules of pennaceous feathers. This makes them very soft and fluffy. These feathers are found under the sturdier exterior feathers. Chicks of hens and young birds are covered by these types of feathers when they hatch. Mainly there are three types of down feathers - body down, powder down, and natal down feathers.

Contour Feathers - These are the exterior feathers of a bird that contribute shape and colour to the feathers. The upper part is waterproof and is made of barbs that form a stiff vane, the flat surface of the feather. The lower part of the feather helps in thermoregulation.

Semiplume Feathers - These feathers are the cross between the contour feather and the down feather. Interlocking in barbs is absent. These feathers mainly provide insulation to the birds.

Flight Feathers - These feathers are present on the tails and the wings. These are usually long feathers. As the name itself suggests, these birds help in flight.

Bristles Feathers - These feathers are a special type of feathers found around the eyelids, mouth, head, and neck. These feathers help the birds to know the speed and direction of the air. These also safeguard the bird's eyes from dust and insects.

Filoplume Feathers - These feathers look like paint brushes and are the smallest type of feathers. The exact function of these types of feathers is still not known.

Parts of a Feather

Let us discuss the parts of a feather in detail. The typical feather contains a central shaft (called rachis), with the serial paired branches (called barbs) forming a flattened, generally curved surface, called a vane. The barbules, as well as the barbs, have roots, and the barbules of neighbouring barbs are connected by hooks, stiffening the vane. In several birds, either some or all of the feathers lack the hooks or the barbules, and the plumage has a hairlike, loose appearance.

•Development of Feathers

- The development of feathers started with the formation of the dermal papilla.
- Then feather primordium formed from the [growth](#) of papilla and its inductor effect on the epidermis on the surface of the skin
- Then feather follicles develop on or around the base of feather primordium
- Feather sheath develop from epidermal [cells](#)
- These epidermal columns develop into barbs
- After the feather sheath split, fluffy barbs stretch out of the quarters and the shaft elongates.

Function of Feathers

The important functions of feathers are given below:

Insulation - It is the most important function of feathers. Protect birds from [water](#) and cold.

Help in Flight - Feathers help in flying

Protection - Feathers protect birds from various poor or fluctuating conditions of the environment.

Visual Communication - They also help in communication.

Thank you