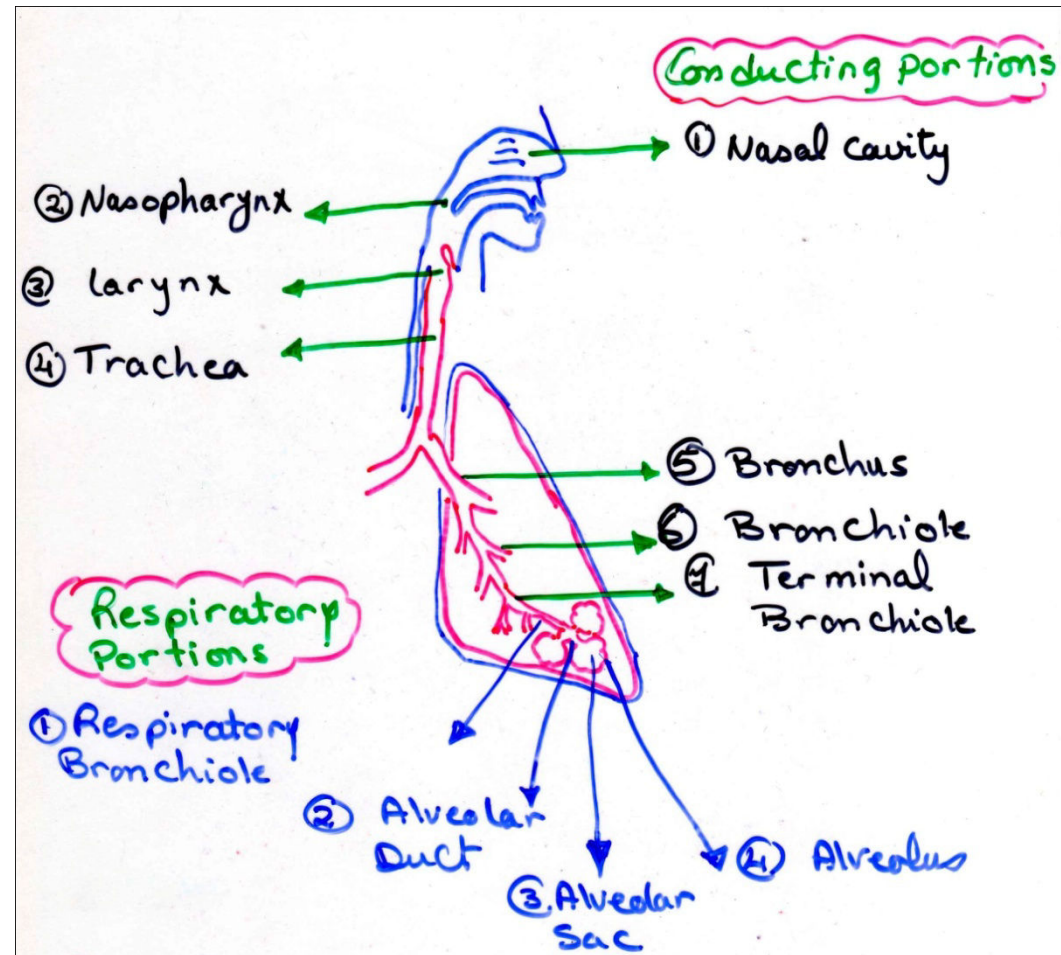




RESPIRATORY SYSTEM

RESPIRATORY SYSTEM



Nasal Cavity

I-Vestibule :

lined by **hairy skin** (to trap and filter large particles & dust from inspired air).

II-Nasal fossae:

Two chambers separated by a septum---- three bony shelves from lateral wall
-----superior, middle & inferior conchae----improve conditioning

Middle & inferior-----respiratory epithelium

Superior----- Olfactory epithelium

Respiratory epithelium

lined by **pseudostratified columnar ciliated with goblet cells** (mucus traps dust---
- cilia pushes it outside).

Epithelium rests on **highly vascular connective tissue corium** (to warm inspired air), it contains seromucus glands (moisten inspired air).

conditioning

Plasma cells, macrophages & leucocytes

Olfactory area

lined by **olfactory mucosa** (smelling).

Site upper posterior part of the nasal cavity

Respiratory epithelium

1- Ciliated columnar cell:

most abundant

300 cilia

apical cytoplasm ----basal bodies & mitochondria

2- Goblet cells:

next most abundant

secrete mucus

3- Brush cell:

columnar ----- abundant apical microvilli

----- basal afferent nerve endings

receptor cell

4- Basal cell:

small rounded ---- do not reach the lumen

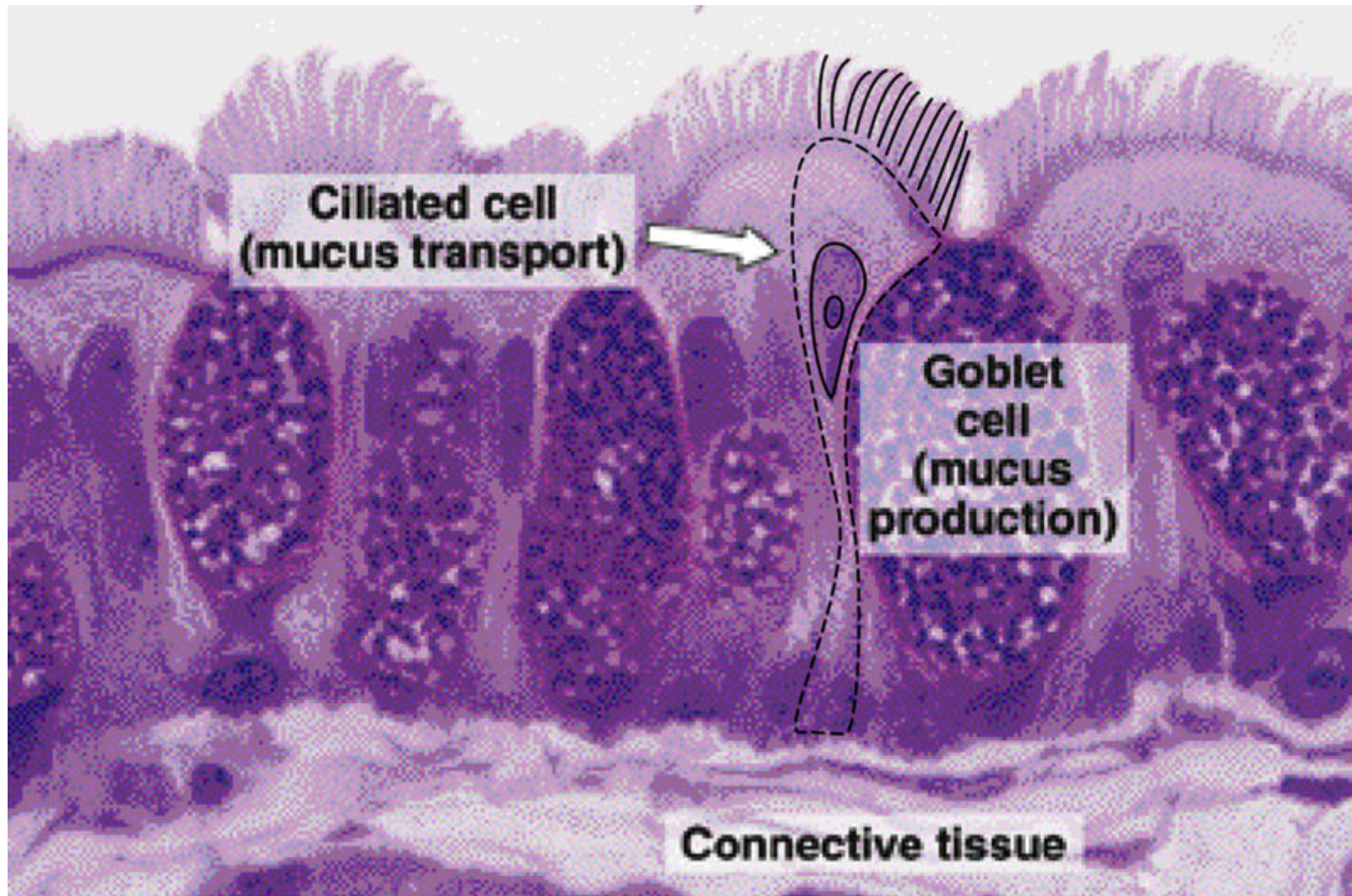
stem cell

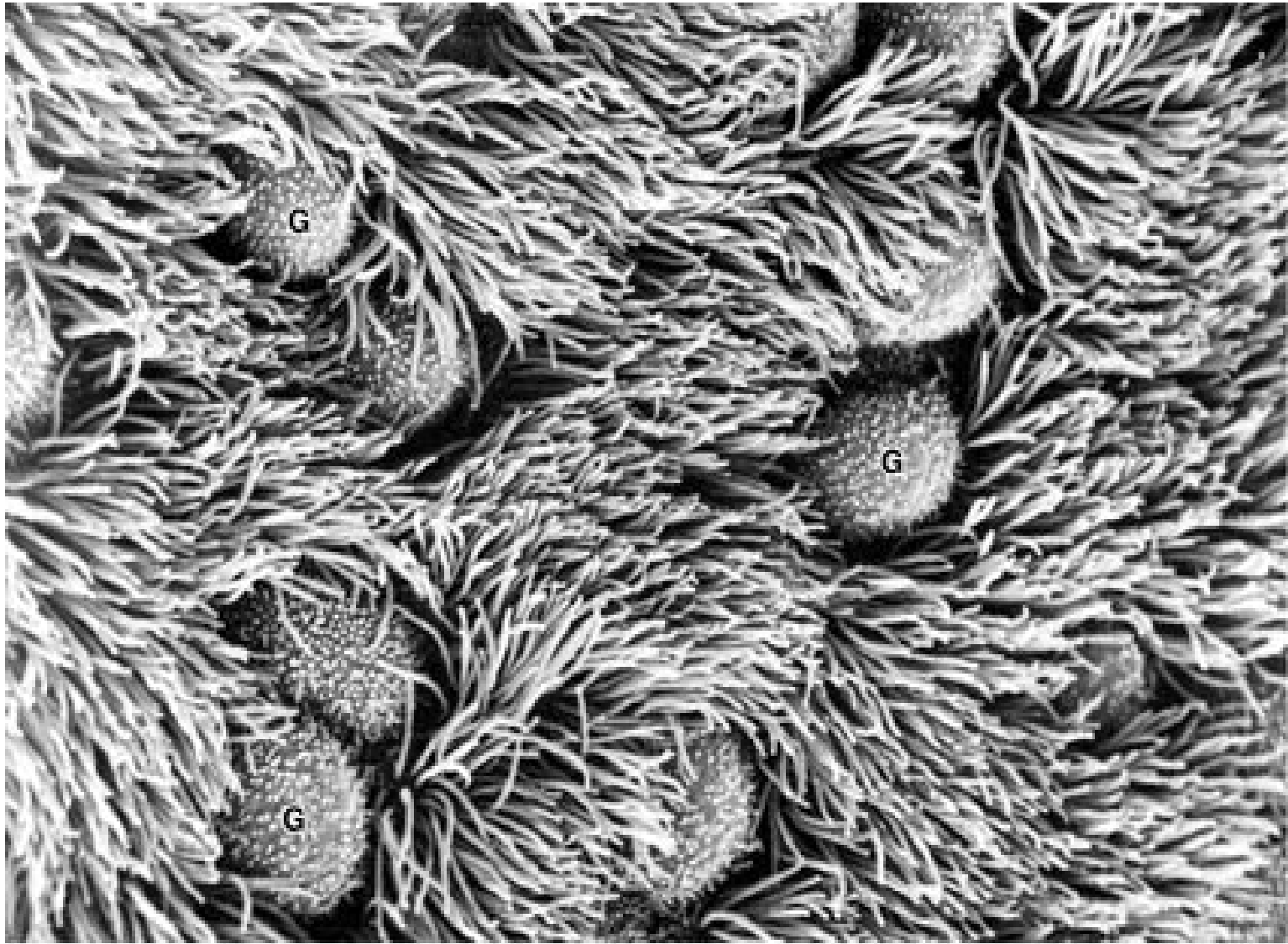
5- Neuroendocrine cells:

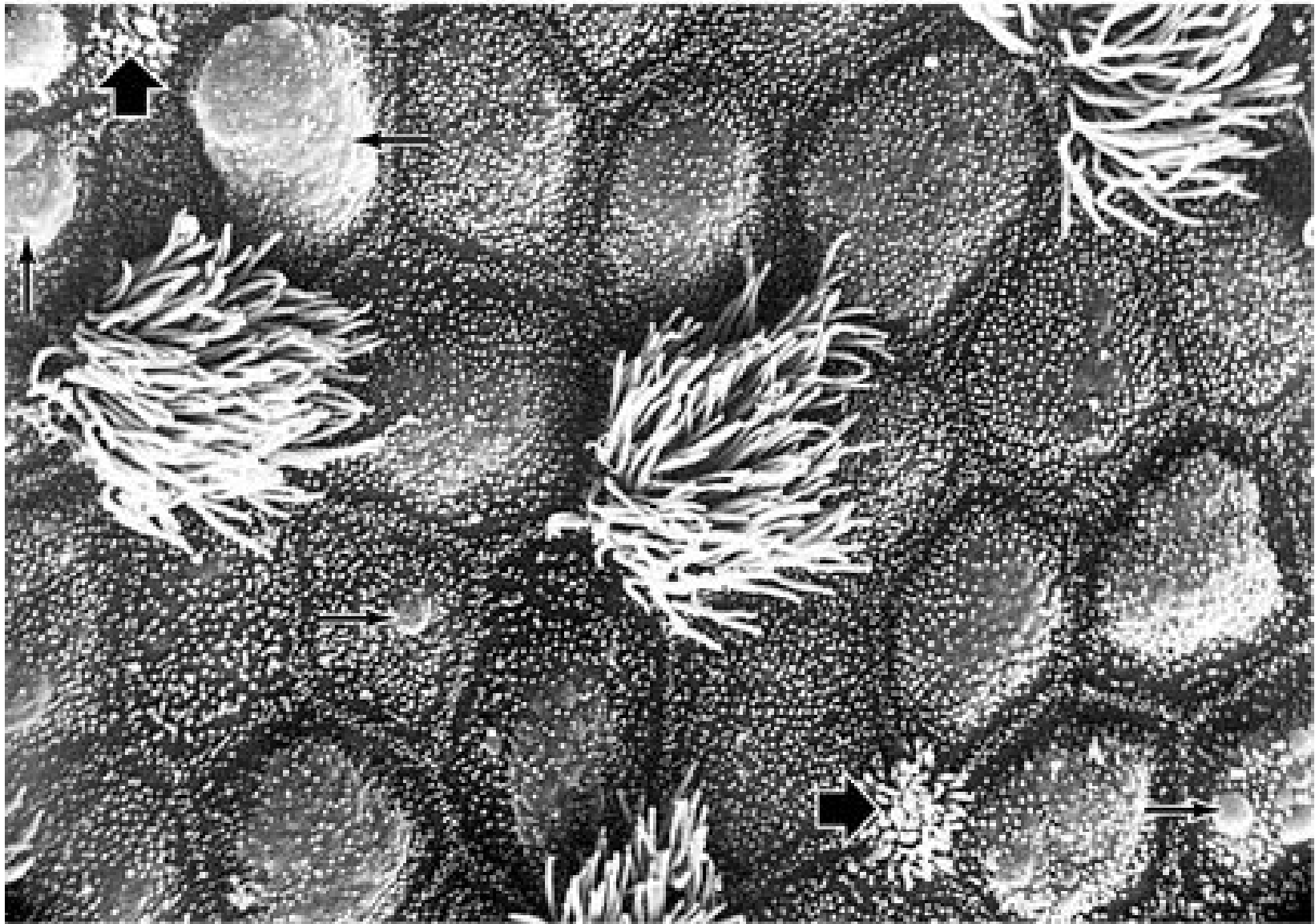
scattered ---- in the epithelium

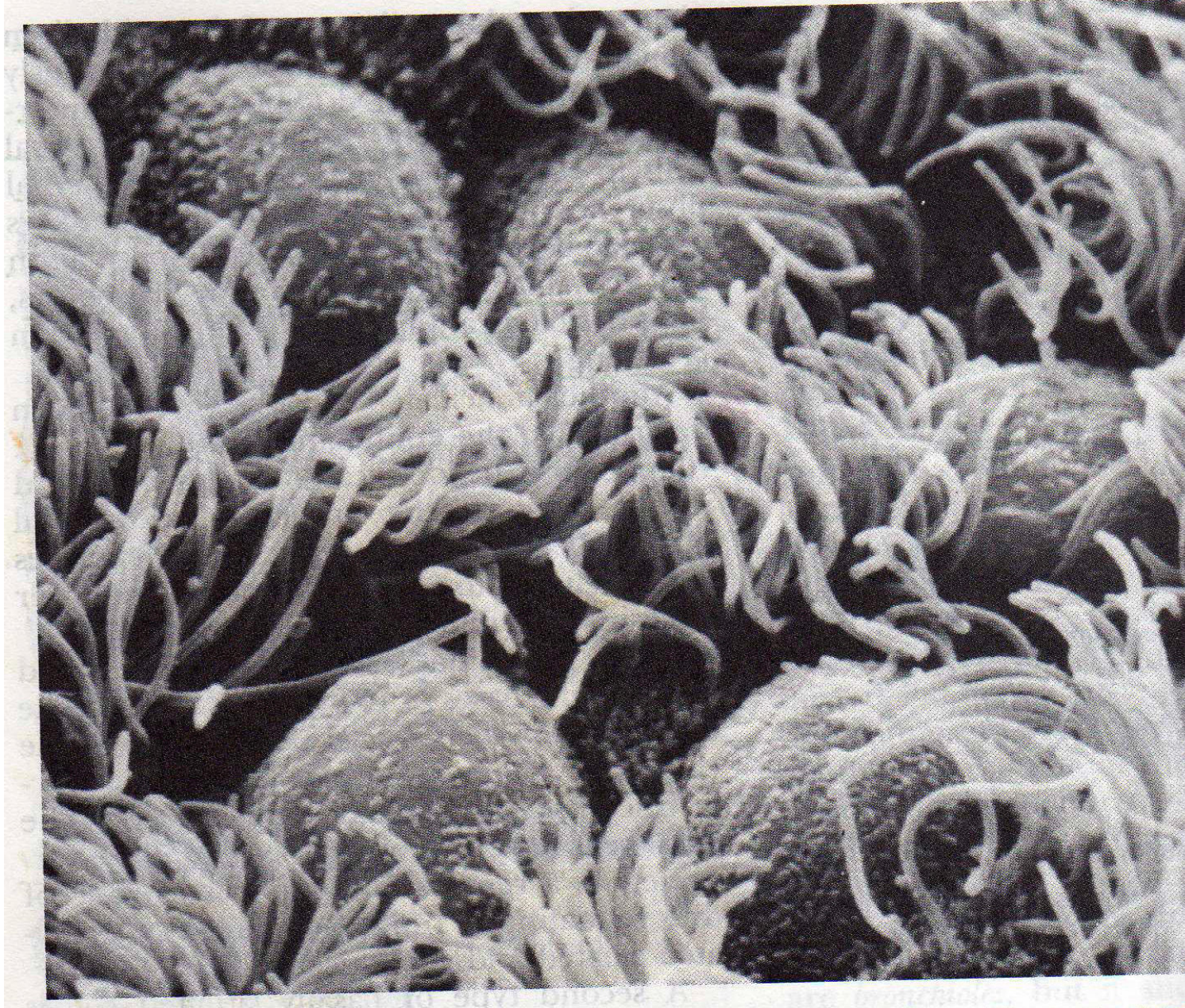
numerous granules with dense core

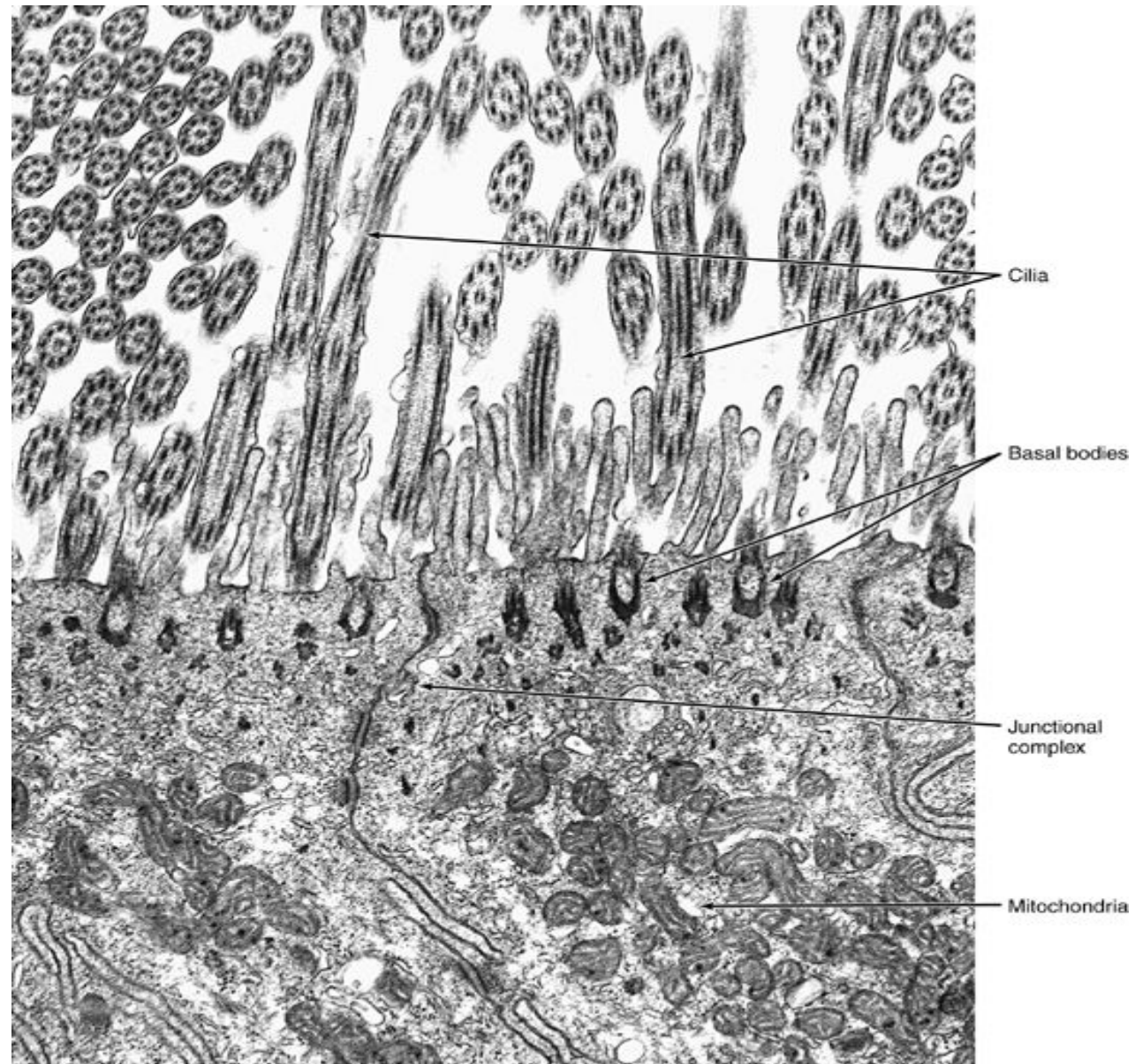
APUD ----- calcitonin, somatostatin & serotonin

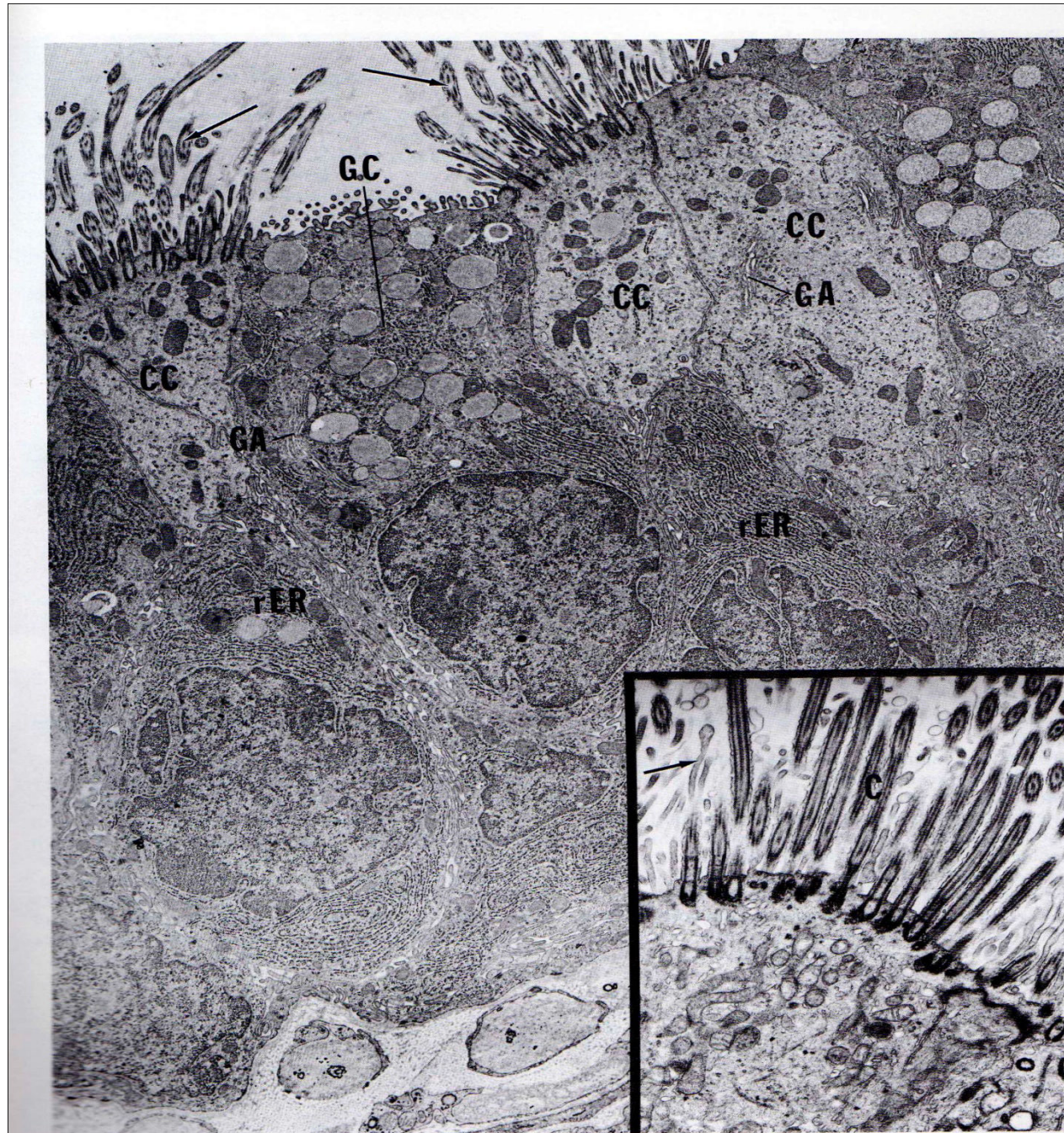












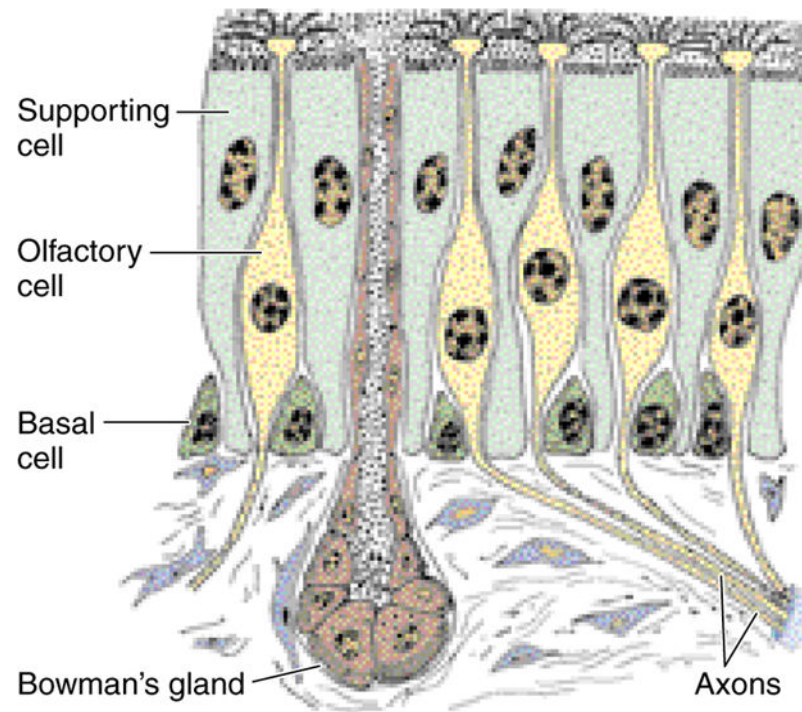
Olfactory mucosa

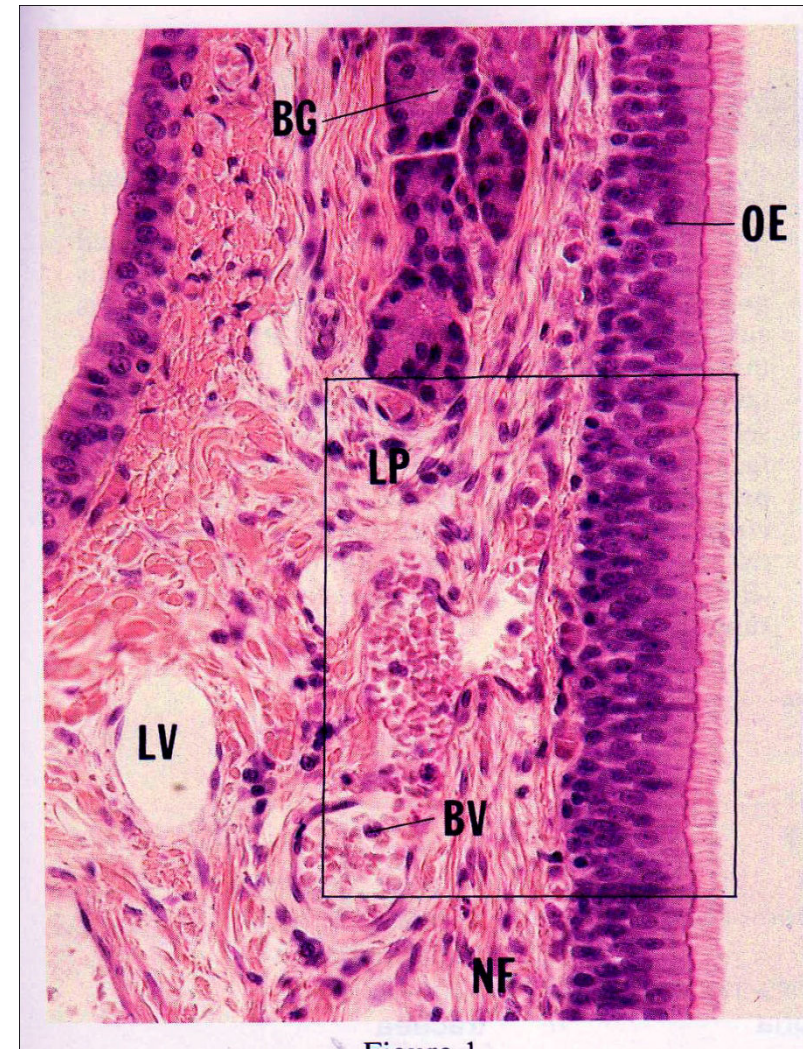
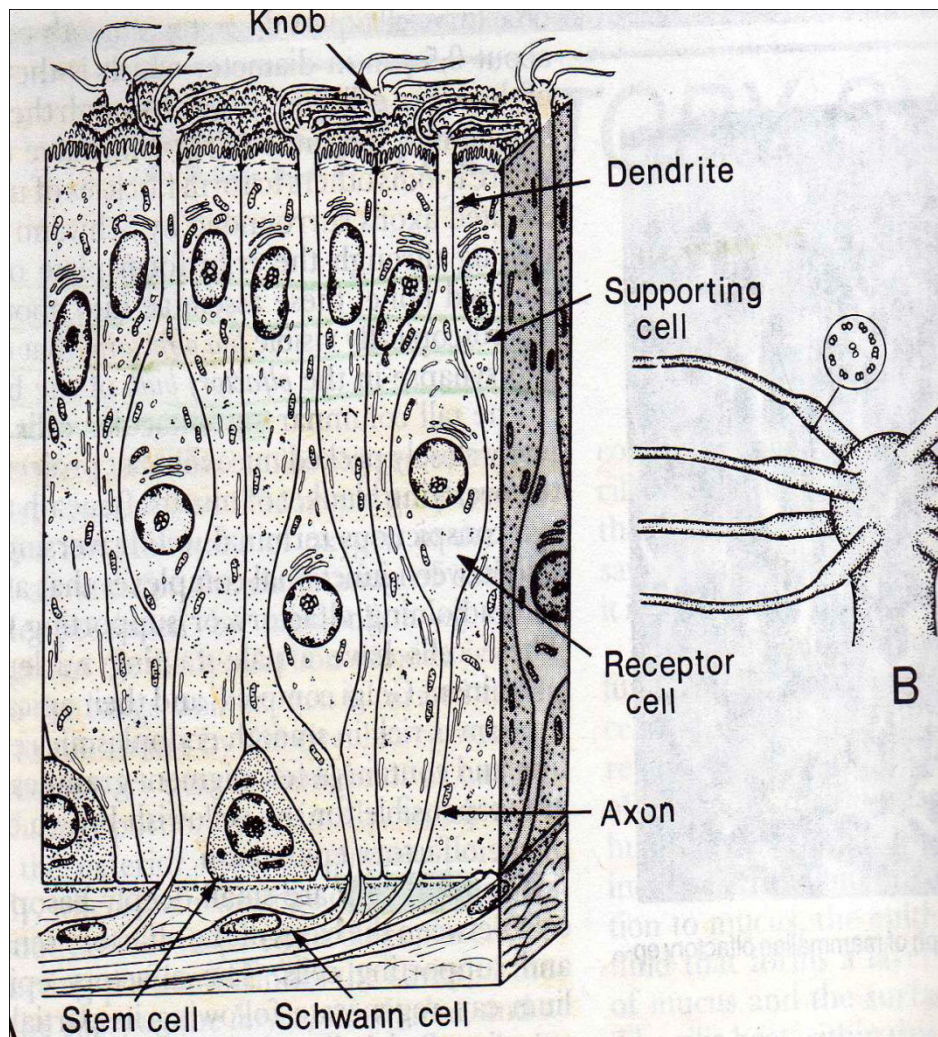
Epithelium

- 1-Olfactory cell
 - Bipolar nerve cell
 - Dendrite – vesicle –
 - Non motile cilia
 - 2-Supporting cell
 - Columnar with oval nuclei, apical microvilli
 - narrow base on BM.
 - 3-Basal cell
 - Stem for both
 - does not reach the surface
- *Bipolar cell are only example for neurone replacement

Connective tissue corium

Bowman's gland
serous in the CT corium





Paranasal sinuses

- Closed cavities in the frontal, maxillary, ethmoid & sphenoid around the eye
- Lined by respiratory epithelium **except :**
 - 1- Epithelium thinner fewer goblet
 - 2- Corium thinner fewer small glands, firmly adherent to periosteum
 - 3- mucus drain into the fossae under the conchae

Nasopharynx

- Continuous anteriorly with the nasal fossae
inferiorly with oropharynx
- Lined by respiratory epithelium
- C.T. corium contain---mucus glands
---pharyngeal tonsils

Larynx

- Connect the pharynx with the trachea
- Functions:
 - 1- Voice production.
 - 2- Prevention of food & fluid from entering the respiratory passage.
- Kept open by cartilage within the lamina propria

Large cartilages Thyroid, cricoid & most of arytenoid--- **Hyaline cartilage**

Small cartilages Epiglottis, cuneiform, corniculate & tip of arytenoid---**elastic cartilage**
- Bound together by ligaments
- Articulate together by intrinsic striated muscle
- Lined by respiratory epithelium **except** vocal cords & anterior surface of epiglottis---- lined by stratified squamous epithelium

Vocal cords

- Two pairs of folds extend into the lumen of larynx
- Upper pair False vocal cords (**Vestibular folds**) ----
respiratory epithelium
prevent the entrance of foreign particles
- Lower pair True vocal cords--- non keratinized stratified
squamous epithelium
- Formed of:--- Vocal ligaments elastic fibers
--- Vocal muscle skeletal
muscle
- Function: tension of the folds & the size of the opening -----
induce different sounds

Trachea

- Kept open by 20 C shaped hyaline cartilage rings

- Formed of:

1-Mucosa:

pseudostratified columnar ciliated with goblet cells

lamina propria: loose CT elastic fibers, nerves, blood vessels & mucoserous glands.

elastic membrane: condensed elastic fibers

2-Submucosa: loose CT lymphoid nodules, nerves, blood vessels & mucoserous glands.

3-Fibrocartilagenous coat: dense CT 20 C shaped hyaline cartilage rings, free ends facing esophagus posterioly ---

bridged by ;

fibro elastic membrane-----prevent overdestintion

trachialis muscle smooth muscle -----constrict the lumen -----increase the force of air flow during cough and forced expiration

4-Adventita: loose CT

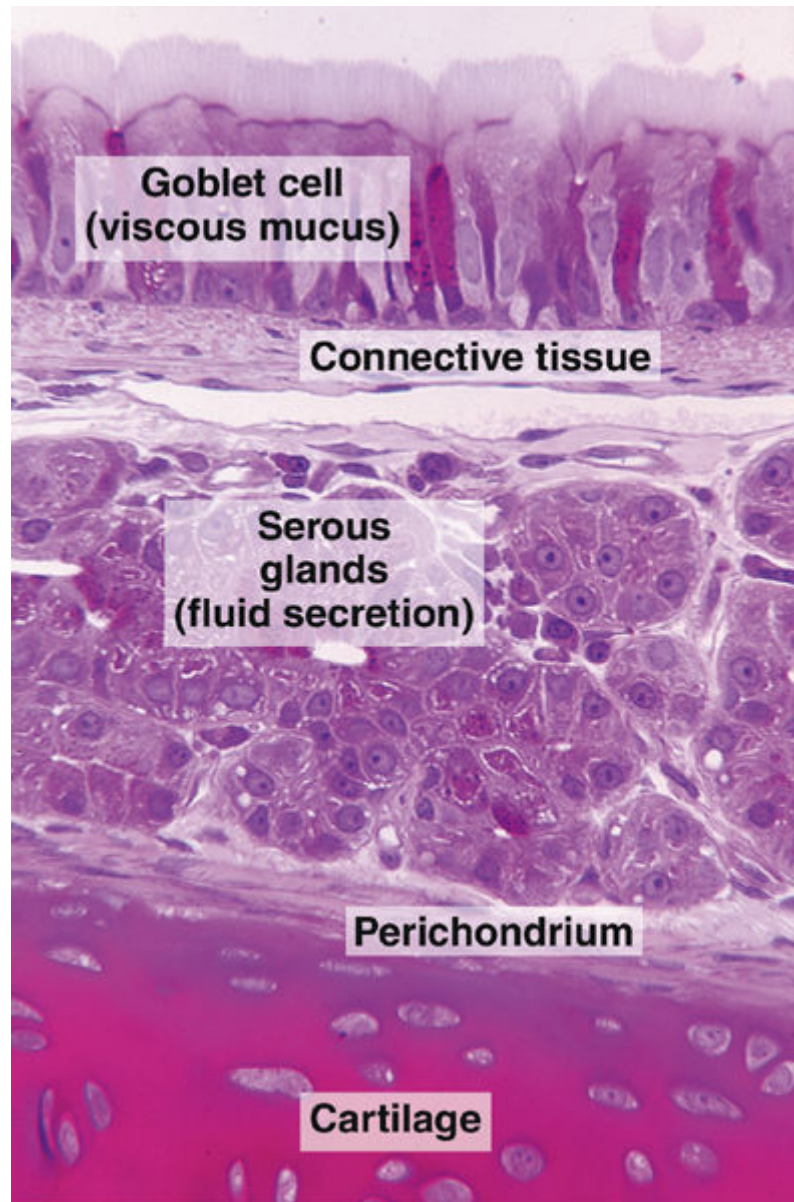
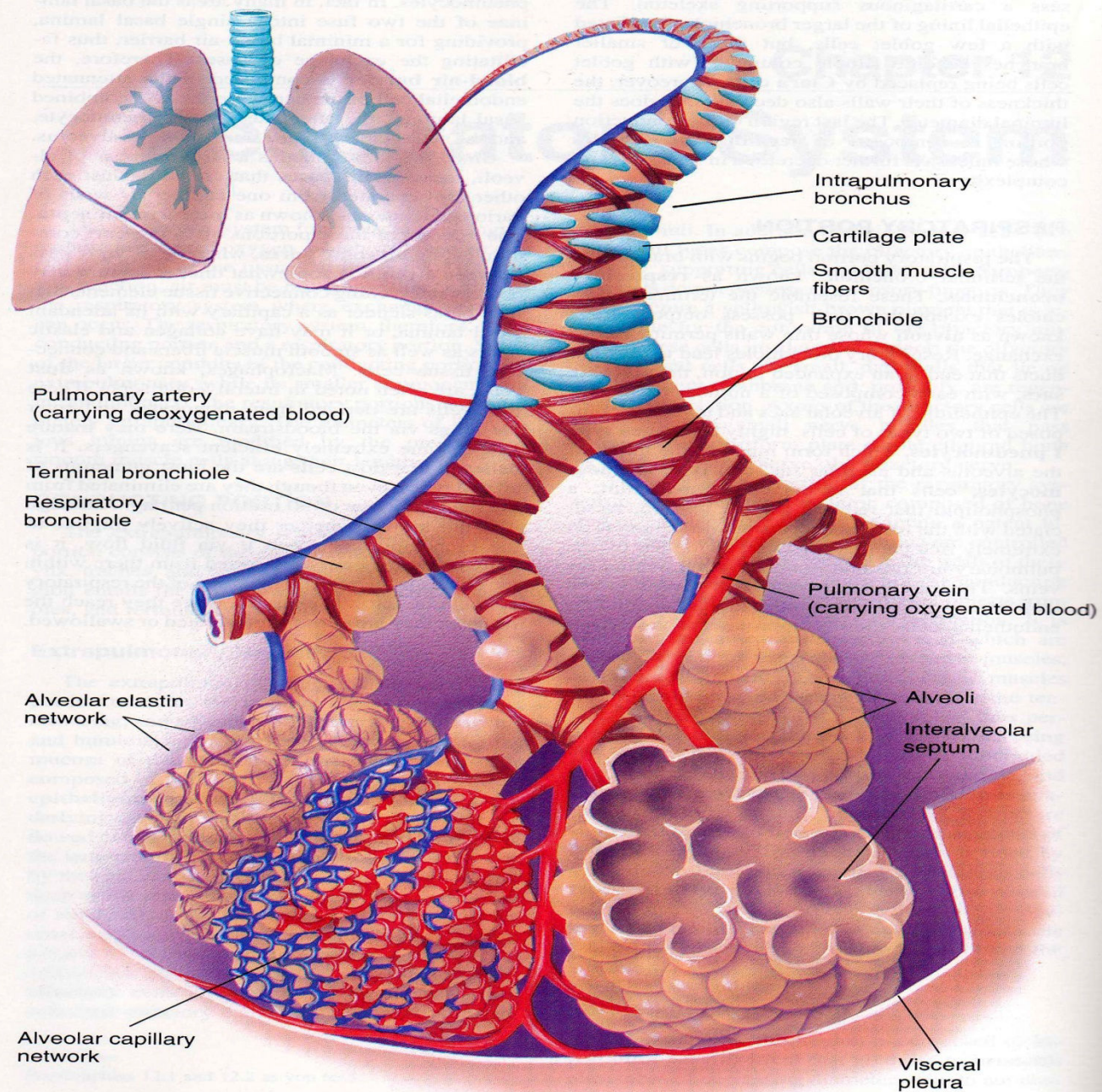




Diagram 2-2. Section in the trachea. (Fig. 2-6)



GRAPHIC 12.1. Conducting Portion of Respiratory System