INTEGUMENT (SKIN) ORGANIZATION*

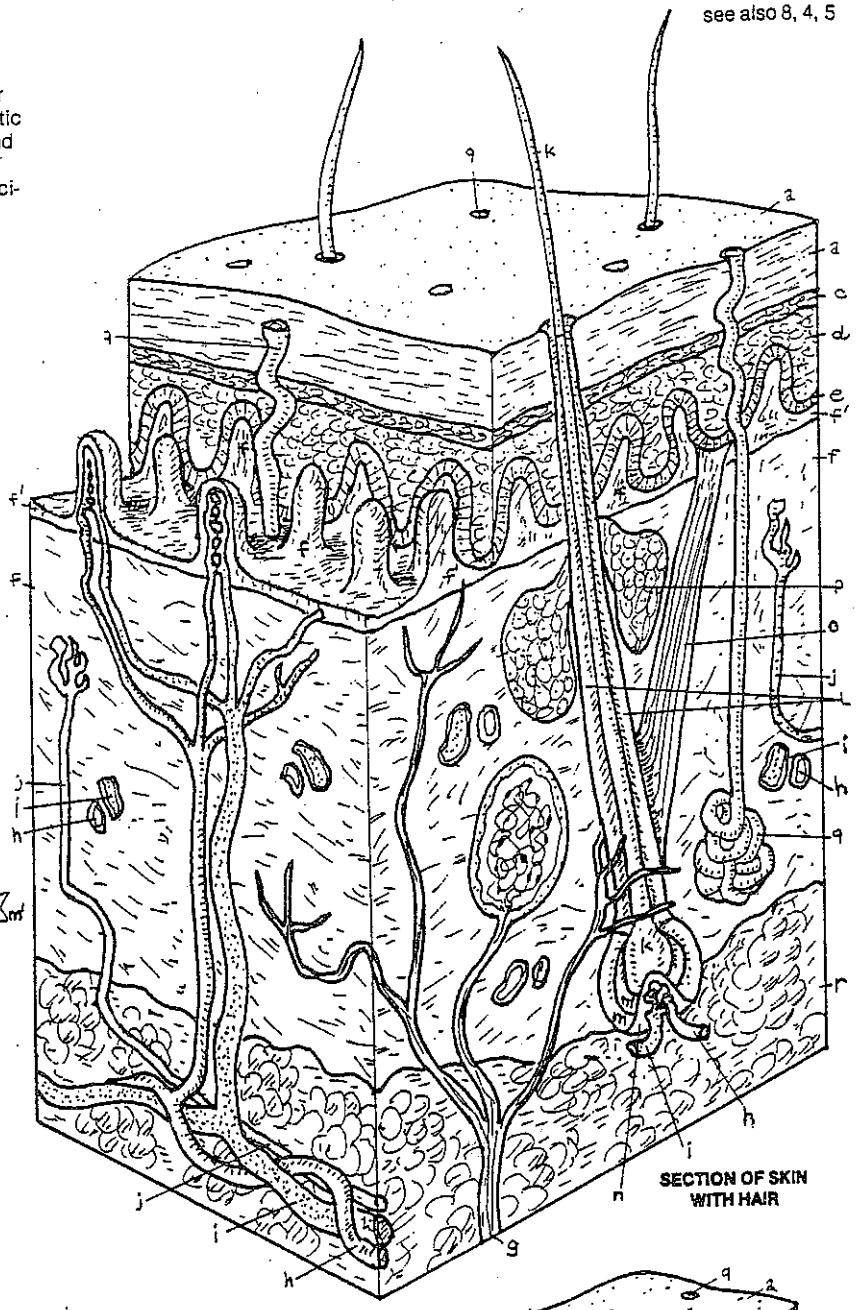
CN 18

1. Reserve yellow for the nerve (g), red for the artery (h), blue for the vein (dotted vessel labeled i), and a light color for the lymphatic vessels (j). Note the vessels cut in cross section in the dermis and at the papilla of the hair follicle.
2. Color both drawings simultaneously. Note that the stratum lucidum (b) is shown only in the lower drawing.

EPIDERMIS*
- STRATUM CORNEUM a
- STRATUM LUCIDUM b
- STRATUM GRANULOSUM c
- STRATUM SPINOSUM d
- STRATUM BASALE e (GERMINATING LAYER) e

DERMIS*
- CONNECTIVE TISSUE f
  - PAPILLAE f'
- NERVE g
- ARTERY h, VEIN i
- LYMPHATIC VESSEL j
- HAIR*
  - SHAFT k
  - FOLLICLE l
  - BULB OF FOLLICLE m, MATRIX m'
  - DERMAL PAPILLA n
  - ARRECTOR PILI MUSCLE o
  - SEBACEOUS GLAND p
- SWEAT GLAND q

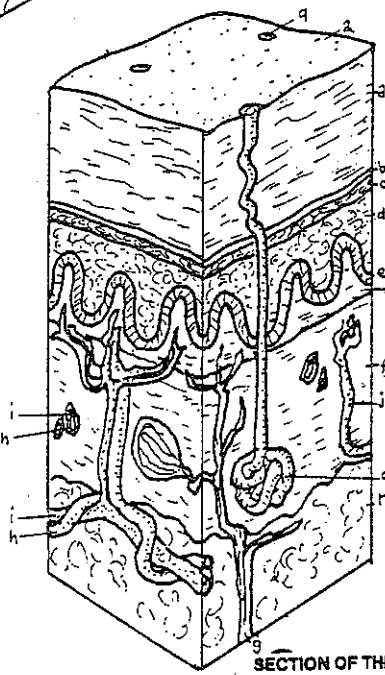
SUPERFICIAL FASCIA r



SECTION OF SKIN WITH HAIR

The *integument* (cutaneous layer), variably thick, highly sensitized and vascular, covering the body consists of two layers: the multilayered epithelial epidermis and the fibrous dermis. The dermis is continuous below with the fatty, fibrous superficial fascia (subcutaneous tissue), an intermediate layer of variable thickness between skin and the deeper structure (fascia-lined skeletal muscle or periosteum-lined bone). The *epidermis* consists of layers of cells most of which arise from the frequently dividing *germinating* cells of the *stratum basale*. The daughter cells are pushed up to form another layer characterized by flattened cells with short spines/processes (*stratum spinosum*). The older cells of the next layer (*stratum granulosum*) have granules that relate to the protein keratin. The next outer layer of cells, seen only in thick skin, consists of flattened cells that form a bright layer (*stratum lucidum*) immediately adjacent to the outer, thick *stratum corneum*. This outer layer consists of flattened ghosts of cells in which the cytoplasm and nucleus have been replaced by keratin (densely packed filaments embedded in a dense structureless medium). It is largely variations in thickness in this layer that account for differences in skin thickness. Cells of the epidermis that do not arise from germinating cells are the pigment cells found in the basal and dermal layers. These cells secrete melanin pigment into the lower epidermal layers and the hair follicles.

The *dermis* consists of thick bundles of fibrous tissue among which are found many *blood* and *lymphatic vessels* oriented in networks, sweat glands, hair follicles and the related sebaceous glands and arrector pili muscles. The avascular epidermis gets its nutrition from vessels reaching up through the *papillae of connective tissue*. *Sweat glands* found throughout almost all skin help to stabilize body temperature by excreting in response to excessive heat. The subsequent evaporation of the excreted fluid is a cooling process. *Sebaceous glands* excrete an oily material (sebum), which helps to protect the skin from dehydration. *Hair* is an outgrowth of epidermal cells that pushed down into the dermis to form the *hair follicle* during early fetal development. Within the follicle *bulb*, concentric layers of keratinized, pigmented cells (originating from the *matrix*) form the hair *shaft* that grows out beyond the surface of the skin. The *dermal papilla*, like the papillae under the epidermis, supply the hair shaft with nutrition from the tuft of vessels. Loss of the papillae means loss of the hair. The *arrector pili muscle*, attached to the hair follicle, elevates the hair shaft and aids excretion of sebum. Skin and all its appendages protect the body against injurious invasion by microorganisms, chemicals, and ultraviolet radiation; play an important role in body temperature regulation; and act as a sensor informing the person of the state of his or her environment (see the next plate).



SECTION OF THICK SKIN FROM SOLE OF FOOT