

Stage 18 Closure of Lens Vesicle

11 Days, 40–44 Somites, 5–6 mm

External Form

The somites in the cervical region are no longer visible. They can still be recognized in the posterior part of the body, especially in the tail. The long tail passes lateral to the head, over the deep nasal pit. The external features are shown in Figs. 150–152.

Streeter did not designate a special stage to mark the closure of the lens vesicle in man. Therefore, our stage 18 is between his horizon XIV (open vesicle) and XV (closed vesicle).

Length. Unfixed embryos are 5–6 mm long.

Sagittal section. The rapid growth and maturation of the brain is striking (Fig. 158). The infundibular recess is distinct, and the opening into the lateral ventricle is beginning to form. The liver is growing rapidly.

Circulatory System

The *heart* is still a curved, undivided tube. The bulbar ridges can easily be recognized in sagittal sections (Figs. 145, 158). For the following stages (11 1/2 and 12 days), the differentiation of the bulbus arteriosus is described in more detail.

The primitive olfactory artery (*arteria cerebri anterior*) branches off from the *arteria carotis interna* at the same time as the nasal pits are developing.

Intestinal Tract

The *thyroid primordium* (Fig. 155) is shaped as a vesicle with a very thick basal wall. The lumen of this vesicle is a remnant of the thyro-glossal duct. It does not correspond to a thyroid follicle. In some embryos of this stage, the vesicle has separated from the surface.

The *lung bud*, stomach, and gall bladder are cut tangentially in the sagittal section shown in Fig. 158.

The epithelial lining of the dorsal mesentery of the stomach is thickened and represents the anlage of the *spleen* (Fig. 159). The thickening is part of the anterior splanchnic mesodermal plate (Green [83]).

The *cloaca* (Fig. 161) is not yet subdivided. The cloacal septum becomes evident in the next stage (Fig. 176).

Urogenital Tract

The *mesonephros* has not changed much since the preceding stage. The genital ridge is more distinct (Fig. 160), but diagnosis of the sex is not yet possible.

Central Nervous System

The brain is now more clearly subdivided, especially the diencephalon [172] with its basal recesses. The epiphyseal evagination, however, has not yet appeared. A marginal layer has formed in the brain stem (Fig. 154). The trigeminal and stato-acoustic ganglia may again be identified in transparent specimens (Fig. 152).

The *otocyst* has an elongated endolymphatic duct.

The *lens vesicle* begins to detach from the ectoderm (Fig. 153). In 2 out of 13 embryos of this group, the lumen had just lost its communication with the amniotic cavity.

The *olfactory plate* is now considerably deepened (Figs. 153 and 162). The bordering rims are beginning to unite. In the human, this stage is reached at a much later developmental phase, in horizon XVI.

Vertebral Column

Sclerotomic fissures are appearing in the trunk region. Later, they become more distinct (Fig. 186).

Material	Age	
KT 949-51	11 days 5 h	8 embryos, 4.8-5.1 mm length. 5-7 tail-somites.
KT 604-5	11 days	6 embryos, 5.0-6.2 mm length.

FIG. 150. Embryo of 11 days 5 h, Bouin fixed, on millimeter scale.
KT 949. 13:1

FIG. 151. Embryo of 11 days 5 h, Formol fixed, 5.3 mm length.
Explanation in drawing Fig. 152.
KT 950. 12.5:1

FIG. 152. Explanation of Fig. 151.

M = mesencephalon, *S* (*broken line*) = plane of section Fig. 153, *Tel* = hemisphere, *G 5* = trigeminal ganglion, *G 7-8* = ganglia of 7th and 8th cranial nerves, *O* = otic vesicle, *Aa* = forelimb bud, *Hl* = hindlimb bud, *1* = mandibular process, *2* = hyoid arch.

FIG. 153. Eye anlage, frontal section, 11 days.

L = lens vesicle, in the process of closure; *A.c.* = arteria carotis interna; *Hy* = enlarged vessel of hyaloid plexus; *Ri* = olfactory pit.

KT 605. 100:1

FIG. 154. Otic vesicle with endolymphatic duct (*De*).

Section parallel to *S* in drawing Fig. 152, same embryo of 11 days; *Rb* = wall of rhombencephalon; *V.c.a.* = vena cardinalis anterior.

KT 605. 100:1

FIG. 155. Thyroid primordium, sagittal section, 11 days 5 h.

Tb = ductus thyreoglossus (closed here).

KT 949/6. 560:1

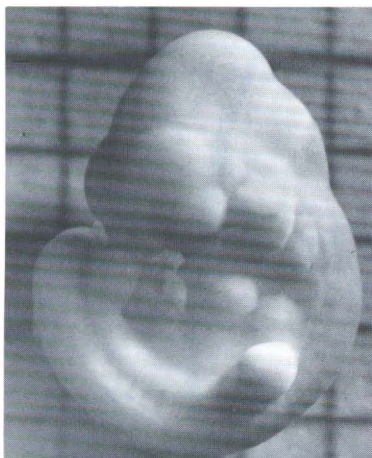
FIG. 156. Placenta with 11 days 5 h.

Section of whole uterine wall. Embryo in situ. *A* = amnion, *Au* = arteria umbilicalis, *D* = yolk sac, visceral layer.

KT 951/3. 18:1

FIG. 157. Detail of Fig. 156.

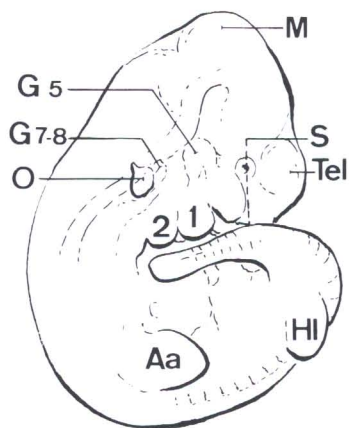
La = labyrinth of placenta. *eG* = ectoplacental glycogen cells, *Rz* = trophoblastic giant cells. 100:1



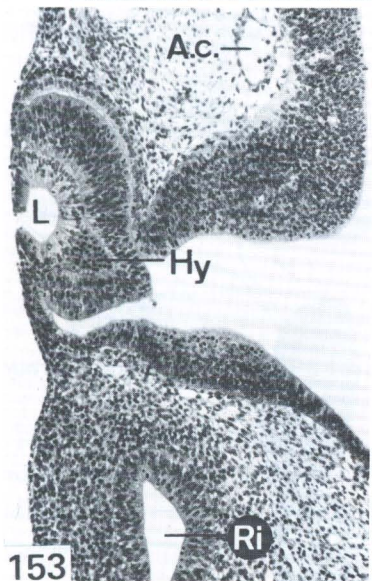
150



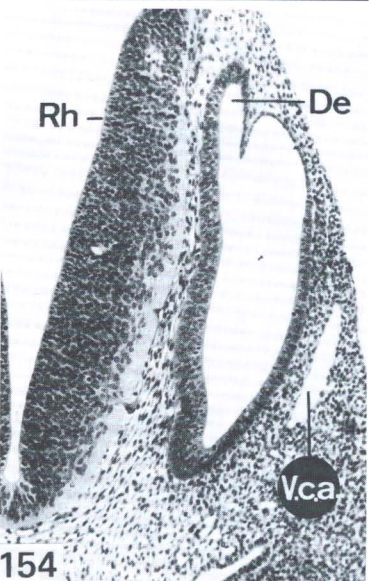
151



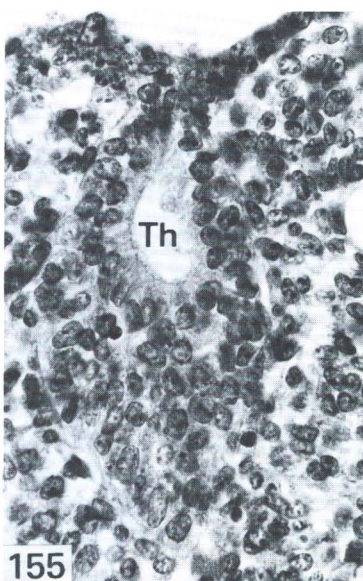
152



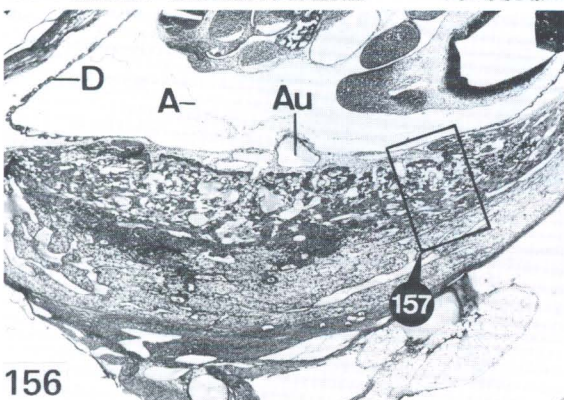
153



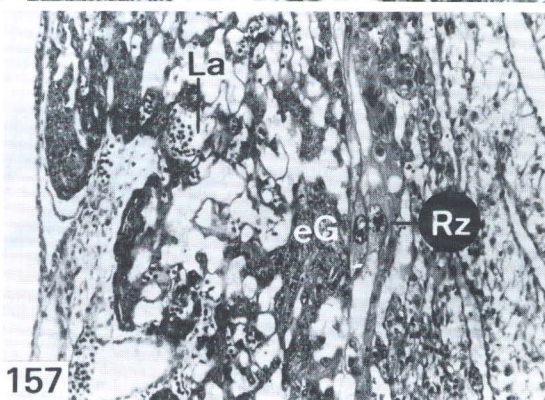
154



155



156



157

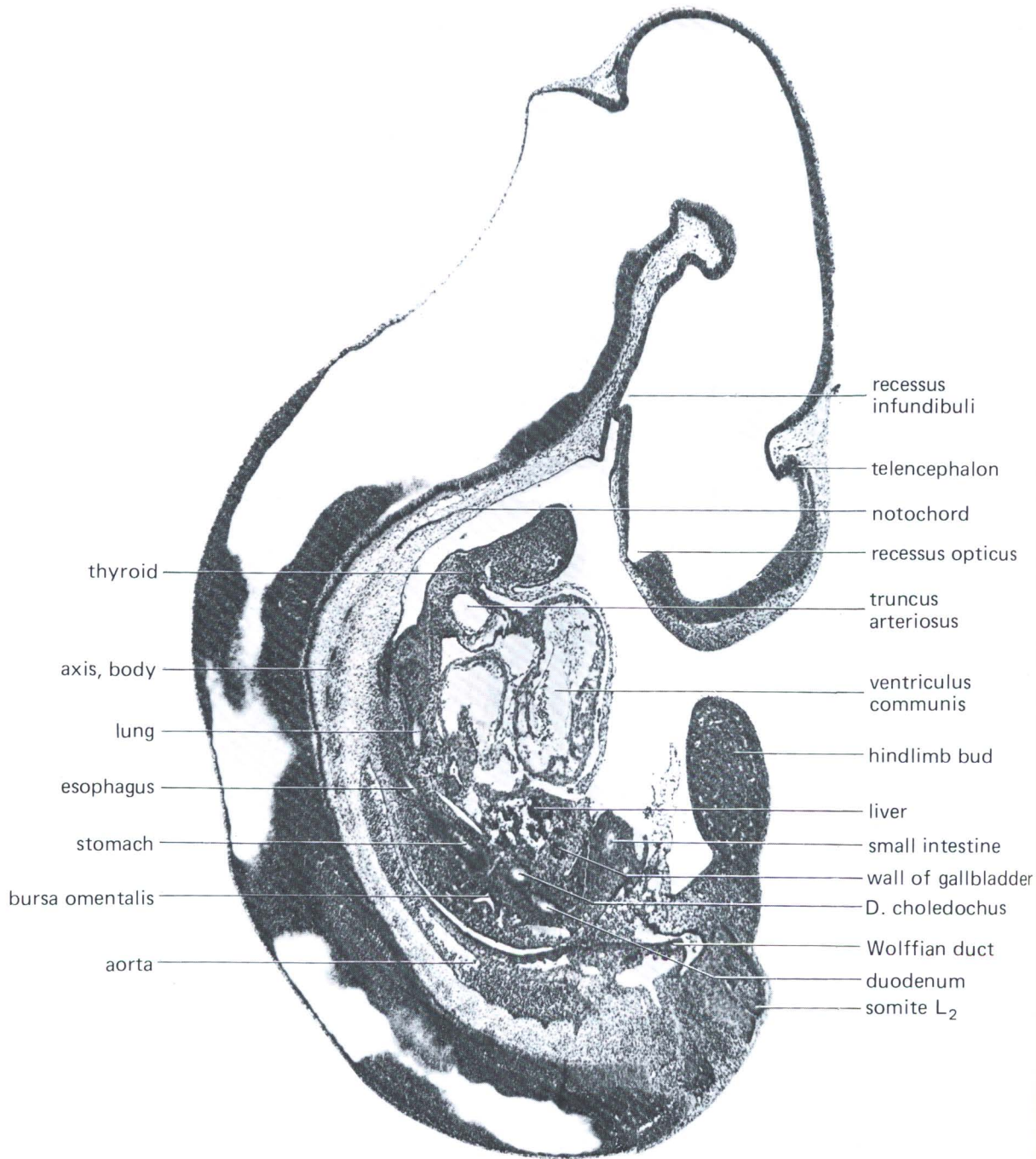


FIG. 158. Sagittal section, 11 days 5 h, 5 mm length.
KT 949/6

FIG. 159. Section through upper thoracic region and anterior limb bud, 11 days 5 h. KT 951/3

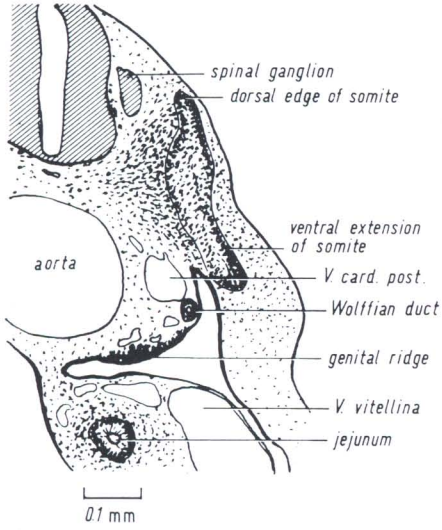
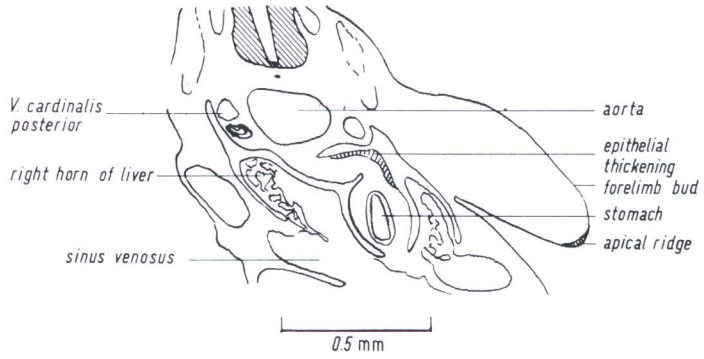


FIG. 160. Cross section through lower thoracic region, 11 days 5 h. KT 951/3

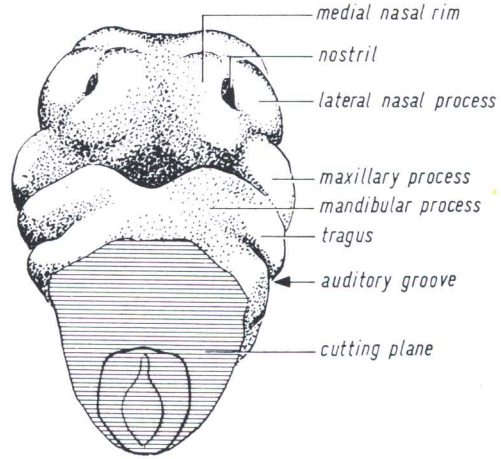


FIG. 162. Ventral view of the head, 11 days. Deep olfactory pit. Nasal folds fused posteriorly.

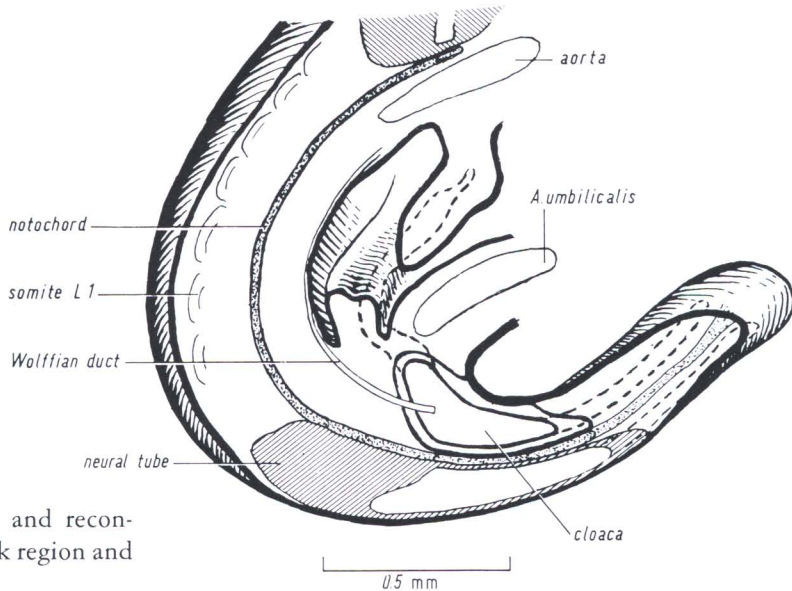


FIG. 161. Sagittal section and reconstruction of posterior trunk region and tail, 11 days. KT 605/2