

Stage 6 Implantation

4 1/2 Days

At 120 hours, there are distinct differences in degree of development of embryos within the same litter. Some embryos are *beginning implantation*, i.e., the blastocyst closely adheres to the undamaged uterine epithelium (Fig. 32). In other cases, there is advanced erosion of the mucous membrane. Some 4-day embryos are also closely adhered to the undamaged uterine epithelium, and so the beginning of implantation is estimated to occur at 4 1/2 days.

Embryoblast and trophoblast can easily be discriminated at this stage. Trophoblastic cells are flat, with prominent nuclei. Embryoblastic cells are spherical and have larger nucleoli than the trophoblastic cells. Both types of cells are rich in RNA. They stain intensively with Pyronin, in contrast to the underlying endometrium. The *entoderm cells* are already recognizable as a distinct layer and their cytoplasm appears even darker than other embryonic or trophoblastic cells. The number of cells varies. For example, specimen KT 859 (Fig. 31) consisted of 76 entodermal, 34 formative (embryoblastic) and 133 trophoblastic cells.

Invasion

Erosion of the uterine epithelium usually begins somewhat below the equatorial zone of the blastocyst. The adjoining trophoblastic cells are transformed into "*trophoblastic giant cells*" [2] (Fig. 35). The nuclei become large and spherical. The nucleoli also enlarge, and the cytoplasm forms long slender processes.

These cells are easily distinguished from the large *deciduous cells* that now appear in the vicinity of the implantation cavity [40]. They contain little RNA and much glycogen. In H.-E.-sections, the glycogen is dissolved and characteristic vacuoles are visible (Fig. 35). Adjacent to the zone of glycogen cells (Fig. 34, D) mentioned above, there is another girde of cells consisting mainly of enlarged deciduous cells without glycogen droplets. Some of these cells have exceedingly large nuclei (Fig. 34, D). At the periphery, toward the muscle layer, the RNA-content of the endometrium decreases considerably.

Material	Age	Blastocysts
KT 859	117 h	1 free, 3 attached, all in one uterine horn. Entoderm distinct (H.-E.-stained)
KT 873	120 h	3 attached in uterus. Entoderm distinct (methylgreen-pyronin stained)
KT 857	124 h	1 free in uterine horn. Entoderm distinct (H.-E.)

Figs. 30–37: Implantation

FIG. 30. Low magnification of uterus, longitudinal section.

M = mesometrium (oblique section), H.-E.

KT 859. 117 h. 40:1

FIG. 31. Blastocyst, enlarged.

KT 859. 560:1

FIG. 32. Blastocyst, 120 h, Carnoy fixation, phase-contrast.

Little shrinkage.

KT 873. 225:1

FIG. 33. Endometrial reaction. Blastocyst attached, 117 h.

KT 859. 135:1

FIG. 34. Detail from Fig. 33.

G = girdle of glycogen cells, *D* = zone of large deciduous cells. 360:1

FIG. 35. Invasion, high magnification.

The trophoblastic cell, *T*, is enlarged, and has penetrated the epithelium. In the connective tissue, glycogen containing cells with typical vacuoles, *V*, are visible, 117 h. 720:1

FIG. 36. Ovary with 4 corpora lutea, PAS, 117 h.

KT 911. 27:1

FIG. 37. Detail of ovary.

Left: margin of corpus luteum, bordering the interstitial gland with enlarged blood vessels and some intensely PAS-positive cells, *P*. 270:1

