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**Anatomy.** — “*The Involution of the Placenta in the Mouse after the Death of the Embryo*”. By Dr. A. B. DROOGLEEVER FORTUYN. (Communicated by Prof. J. BOEKE).

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In various species of mammals which are pregnant with several embryos at the same time it accidentally occurs that one or more embryos die before birth. The subsequent fate of the placenta has been controlled in only a few cases and it appears to be intimately connected with the structure of the placenta. Now this structure in the mouse considerably deviates from that in many other mammals. So it seemed to be worth while to investigate in this animal too, as has not yet been done, the involution of the placenta after interruption of the pregnancy. For this purpose the uteri of 8 mice were at my disposal containing together besides many normal egg-chambers 20 egg-chambers without an embryo. Judging from the degree of development of the normal egg-chambers one of the 8 mice had been killed on the 13<sup>th</sup> day of the pregnancy, one on the 15<sup>th</sup>, four on the 16<sup>th</sup>, one on the 17<sup>th</sup> and one on the 18<sup>th</sup> day.

The 20 empty egg-chambers are more fully described in a paper that I offered to the “*Tijdschrift der Nederlandsche Dierkundige Vereeniging*”. Here I shall only communicate the results in a general way.

Never was any other trace of the embryo left than some free cells which could not be duly recognised. Many portions of the foetal membranes survived the embryo, but they did not all do so during the same time. So among the empty egg-chambers some groups could be recognised with more or less remainders of the foetal membranes.

In the first group the giant-cells (in the mouse trophoblastic cells which are greatly enlarged and have become independent) and the membrane of REICHERT were left and moreover parts of the ectoplacental cone and of the proximal or distal entoderm of the yolk-sac or of both. The proximal entoderm of the yolk-sac could be well recognised by the appearance of the cells, but it had always been broken into pieces. The distal entoderm of the yolk-sac sometimes lined large pieces of the membrane of REICHERT internally; besides free cells of it occurred. The ectoplacental cone

never inclosed embryonic blood-vessels, but sometimes some connective tissue of the allantois entering the ectoplacental cone together with the large blood-vessels. Always the cells or the syncytium of the ectoplacental cone could be recognised. In some cases they changed into young giant-cells, which in normal circumstances too can originate from cells of the ectoplacental cone. Often spaces filled with maternal blood lay between the cells of the ectoplacental cone, as is the case in normal egg-chambers. REICHERT'S membrane could easily be recognised as the homogeneous membrane that develops beneath the trophoblastic epithelium when it changes into free giant-cells. After the disappearance of the embryo the contraction of the uterine wall had pressed the greater part of the ectoplacental cone into the space previously occupied by the embryo. Moreover this contraction had folded REICHERT'S membrane. Sometimes this membrane had much diminished in size, but it always showed the aperture through which the cells of the ectoplacental cone previously cohered with the allantois.

Generally the giant-cells very clearly showed their power to ingest erythrocytes and other portions of the maternal decidual tissue, but they had hardly changed in this group. This was not so in the second group of empty egg-chambers where, as to the foetal elements, only the distal entoderm of the yolk-sac, the membrane of REICHERT and the giant-cells were left. There several of the latter cells had grown out till they reached dimensions that were extraordinary even for giant-cells. In normal egg-chambers it is the task of the giant-cells to attack the decidual tissue and the maternal blood and to leave part of the ingested food to the embryo. As soon as they have been loosened from the trophoblastic epithelium or the ectoplacental cone they lead an independent life. After the death of the embryo the only change is the fact that of course the giant-cells can provide no longer any food to the embryo. They keep all to themselves and consequently thrive extraordinarily. In all directions they acquire the same dimensions, as the pressure of the embryo which in normal egg-chambers flattens them much, has been suspended. Therefore the space occupied by the giant-cells is much larger than in normal egg-chambers. Their number only seems to me to be larger, because they are not dying away so soon as in normal egg-chambers, not because more of them would have developed. Yet here too the fate of the giant-cells is to die away. This is more conspicuous in another group of empty egg-chambers where giant-cells are the only foetal element that is left. Especially here one sees the body of the giant-cell losing its affinity for the dyes

and dissolving, leaving the naked nucleus behind. Afterwards the nucleus submits to the same fate.

The giant-cells have not been able to consume the whole layer of decidual tissue before they disappear. Yet this layer must be removed if the normal situation of the uterine-wall is to return. Therefore the giant-cells are supported by another type of cells, apparently amoeboid wandering cells with phagocytal qualities. These cells are of a hitherto unknown kind and in normal egg-chambers they do not occur, not even post partum. Their shapes and sizes are very variable. They have a nucleus which generally lies eccentrically and sometimes two or more nuclei. Their cytoplasm stains remarkably intensely with eosin dissoluble in water, whereas eosin dissoluble in alcohol stains them, it is true, but not extraordinarily. I propose to call these cells eosinophilous phagocytes. About their origin nothing is known to me, but I think that they are maternal cells. The eosinophilous phagocytes were lacking only in one of the twenty empty egg-chambers, and this one obviously had been preserved within a day after the death of the embryo. In the first place they appear in small groups between the group of giant-cells and the layer of unattacked decidual tissue. These groups enlarge into constantly thicker layers, which are always situated either between the decidual tissue and the giant-cells or between the former and the uterine cavity. The eosinophilous phagocytes attack only the maternal decidual tissue and not the giant-cells and they continue to do so after the disappearance of the giant-cells. So a fourth group of empty egg-chambers exists where one sees no foetal rests at all, but only eosinophilous phagocytes which remove the layer of decidual tissue, which has in the mean time greatly diminished in size. I could not observe the disappearance of the eosinophilous phagocytes.

As is known, in egg-chambers of the mouse the uterine cavity disappears at the mesometrical side of the embryo to extend at the antimesometrical side of the embryo starting therewith from the portions of the uterine cavity that are lying between the egg-chambers. Before the parts of the new uterine cavity reach one another in the middle of the egg-chamber, which occurs on the 17<sup>th</sup> day of the pregnancy, a more or less thick partition of decidual tissue in the egg-chamber separates the parts of the new uterine cavity, which approach one another. Now this partition can be found in many empty egg-chambers, but in some it has been ruptured, in others it is attacked by eosinophilous phagocytes, and in still others it has been removed prematurely by eosinophilous phagocytes.

I cannot even guess the cause of the death of the embryo, but I observed that the embryo may perish at different ages. At least I think I have met with a case where this occurred on the 8<sup>th</sup> day and with another where this occurred on the 16<sup>th</sup> day. He who disposes of younger specimina (my youngest embryos were of the end of the 13<sup>th</sup> day) probably will also find eggs that have perished before the 8<sup>th</sup> day. Moreover it appears that in one and the same uterus embryos may die away at very different ages. I discovered in the same uterus one of the empty egg-chambers with the smallest and one with the greatest quantity of foetal rests, and I conclude that one embryo had been dead a much longer time than the other.

*Leiden.*

*Anatomisch Kabinet.*