

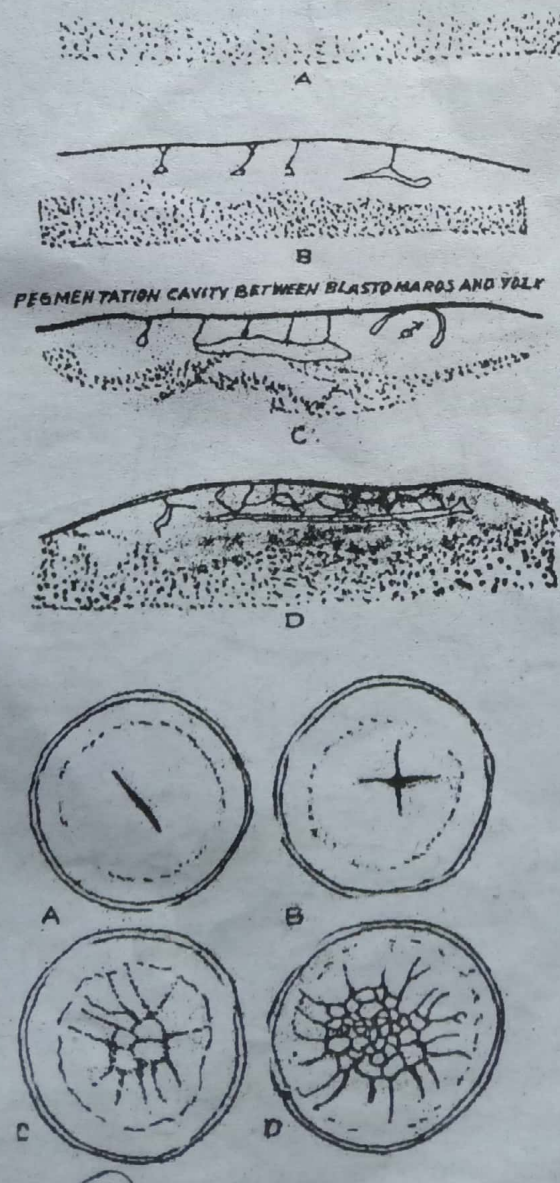
Topic- Development of chick up to the formation of three germinal layer.

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Q. ■ Describe the development of chick up to the formation of three germinal layer.

Ans. The evolution of land laid eggs marked a great advance in the history of life on earth. It is likely that the first land laid vertebrate eggs were those of amphibious ancestors of the reptiles, which live in water and fed on fish. Thus, there were advantages in placing the eggs on land for the embryos, unlike water larvae they were not subjected to the fouling of the water and a lack of oxygen.

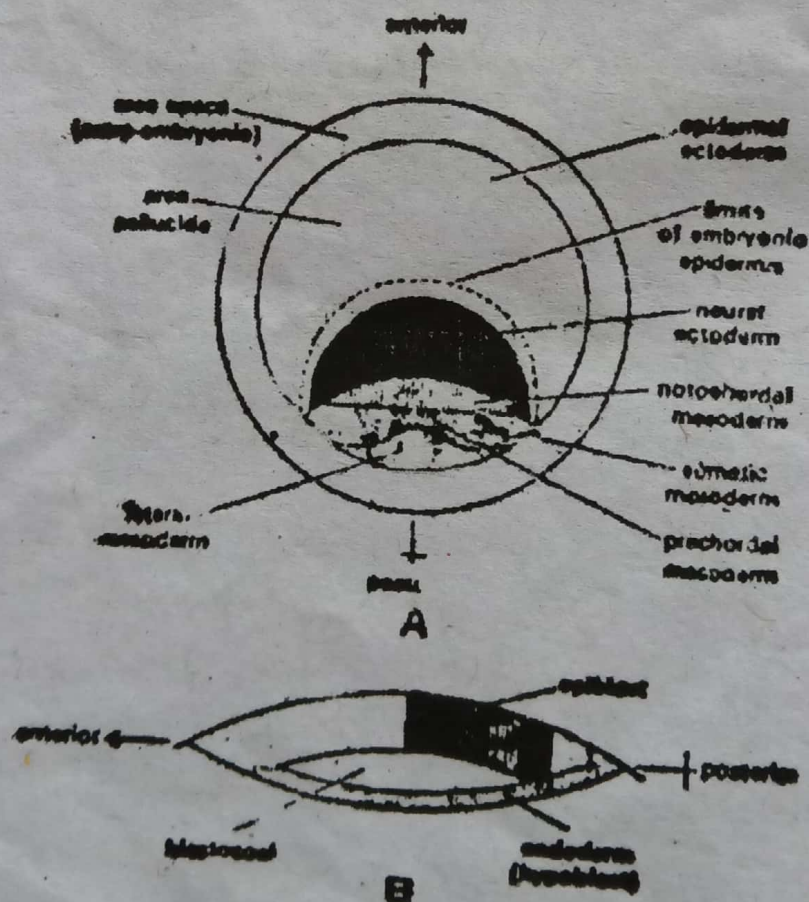
Cleavage—In chick, the discoidal meroblastic cleavage remains restricted to the germinal disc. The yolk remains in uncleaved state and is encompassed by the growing tissues of the embryo. The first cleavage furrow consists of slight meridional incision near the centre of the germinal disc.



The second cleavage furrow is at right angle to the first and homologous with the first. The third set to cleavage furrows is vertical cutting across the second set of meridional furrows, and consequently tends to parallel the first cleavage furrow. The fourth set of cleavage furrows is also vertical.

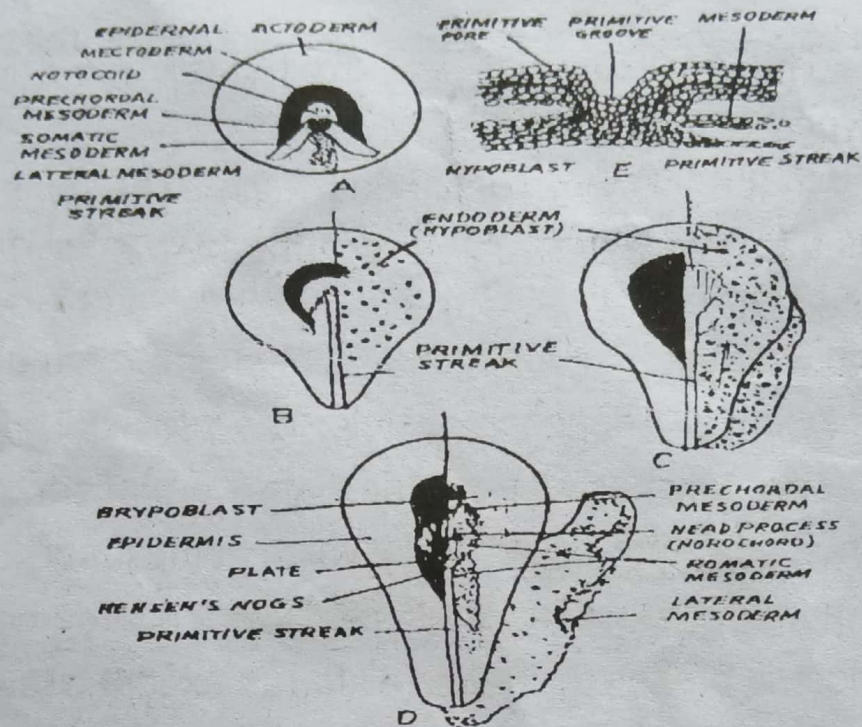
After sometimes the cleavage pattern becomes irregular and by repeated number of divisions a blastula is formed but the blastomeres are clearly differentiated into the peripheral marginal cells and the inner central cells.

Blastula— The blastula of chick of blastoduse type and in vertical section two types of cells types of cells are clearly seen. The peripheral cells extend into the yolk are continuous with it. The central cells are group of cells attached with each other in the form of layer and below which is blastocoel.



Gastrulation— Before gastrulation start the blastoderm are to become differentiated into an area opaca and area pellucida. The area pellucida in the region where the central cells are located and where

the future embryonic development will take place. The area opaca is the region of marginal cells from where the embryo will get nutrition by the vitelline artery and veins. The exact method of the formation of Hypoblast (endodermal cells) is not clearly understood but there are regions to believe that they are formed by a delamination of the upper cellular layer. Small cells first of all fill the blastocoel, soon they form a layer which lines the yolk layer to form a complete endoderm.



Formation of Primitive streak—The most important aspect in the development of chick is the formation of the primitive streak by which the mesoderm is separated from the ectoderm. As soon as the ectoderm has been formed. The area pellucida slightly elongates and process starts in the cell known as convergence which is a process in which the mesoderm cells move all the direction in the centre of the area pellucida and after forming a line in the centre of the area pellucida. They move inward as the cells accumulate in the centre, a line is formed called as primitive streak. A distinct swelling at the antewer and of primitive streak and is called primitive Knot. Due to heavy blow of cells in the centre of the primitive streak, a groove is produced called primitive groove. The cells of mesoderm move inward and occupy a place between ectoderm and endoderm.

The stage of disappearance of the definitive primitive streak may be said to mark the end of gastrulation and beginning of the neurulation. The fully formed chick gastrula consists of three germ layers—ectoderm, notochord, mesoderm and endoderm.