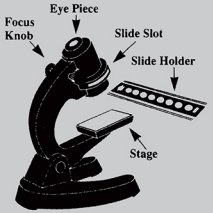
INSERT HERE

MICRO-SLIDE-VIEWER™



Face the Micro-Slide-Viewer so that as much light as possible falls on the white Stage.

Insert the numbered end of the Slide Holder into the Slide Slot of your Viewer, moving it from your right to left.

View with your eye close to the Eye Piece.

With Slide No. 1 in place, focus by turning the Focus Knob.

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7 EARLY GASTRULA (160X)

By reducing magnification to half that of the previous slides, we can see two different embryos in the next stage – the gastrula (GAS-true-la).

Embryo (A) shows the first sign of cells beginning to change because of the different functions they will have to perform. In this process, which is called differentiation, the cells at one end (C) become slightly larger, making that part of the embryo somewhat thicker.

Embryo (B) show a later development. The thicker part is beginning to fold inward. The process of differentiation is definitely going on in this embryo.

The cell layer (D) remaining as the outer surface is called ectoderm (ECK-toe-derm), meaning outer skin. The part folding inward (E) is called endoderm (EN-do-derm), meaning inner skin.

Each of these two layers of cells will form a different system of organs. The design for the special part they play was determined by the chromosomes of the zygote

8 LATE GASTRULA (240X)

The infolding has progressed so that the endoderm (E) is beginning to take a definite form of its own.

A short time after this stage, a mass of cells will begin to grow from the region (M) and will fill much of the space between the ectoderm (D) and the endoderm. This new group of cells is called the mesoderm (MEZ-O-derm) or the middle skin.

This is essentially the end of the story of cleavage. The further development of the embryo will show how each of these three layers forms grooves, folds, pockets, branches, etc., developing all the systems of organs.

CLEAVAGE

All living things begin life as a single cell. Some remain as one-cell adults. The protozoa, the bacteria and many types of algae, (AL-jee) spend their entire life-cycle as a single cell.

Between the simplest one-cell form of life and man, the most complex, there is a whole series of many-celled living things with increasingly complicated cell structures.

One of the greatest of the unsolved mysteries of life is the ability of a single cell to form such a vast variety of different cells, tissues and organs. More remarkable is the fact that the one-cell stages of many living things are so amazingly alike. If you place on a slide, side by side, the fertilized eggs of a human, a lion and a kangaroo, there are few experts who can tell them apart. Yet, from the human egg cell only a human being will develop, only a lion from the lion egg cell, only a kangaroo from the kangaroo egg cell.

In trying to solve these mysteries, scientists study the development of living things from their beginnings as a single cell.

The slides in this set show the egg cell of a starfish. Since the early stages of the starfish are similar to those of man, they help us to learn about the beginnings of our own body.

The magnification given, for example, 320x for slide 1 – One-Cell Stage – means that the microscope was set at that power when the photograph was taken.

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