

# **Animal Form and Function-II**

## **Descriptive Embryology**

# Primary germ layers and their derivatives

**Primary germ layers give rise to tissues and organs**

## **“Differentiation”**

**Ectoderm:**

**Outer body wall**

**Mesoderm:**

**Tissues between ectoderm and endoderm**

**Endoderm:**

**Inner lining of the digestive cavity**

# Echinoderm Embryology

- **Convenient models**
- **Little and evenly distributed yolk**
- **Holoblastic cleavage**
- **After few hours morula forms**
- **Blastocoel (fluid filled cavity) forms around which cells form a single layer**

## **Echinoderm Embryology**

- **This is hollow sphere, a Blastula**
- **In sea urchin this happens in fertilization membrane**
- **Cilia develop and blastula breaks out**
- **Primary mesenchyme forms by groups of cells which break free of the animal pole**

# Echinoderm Embryology

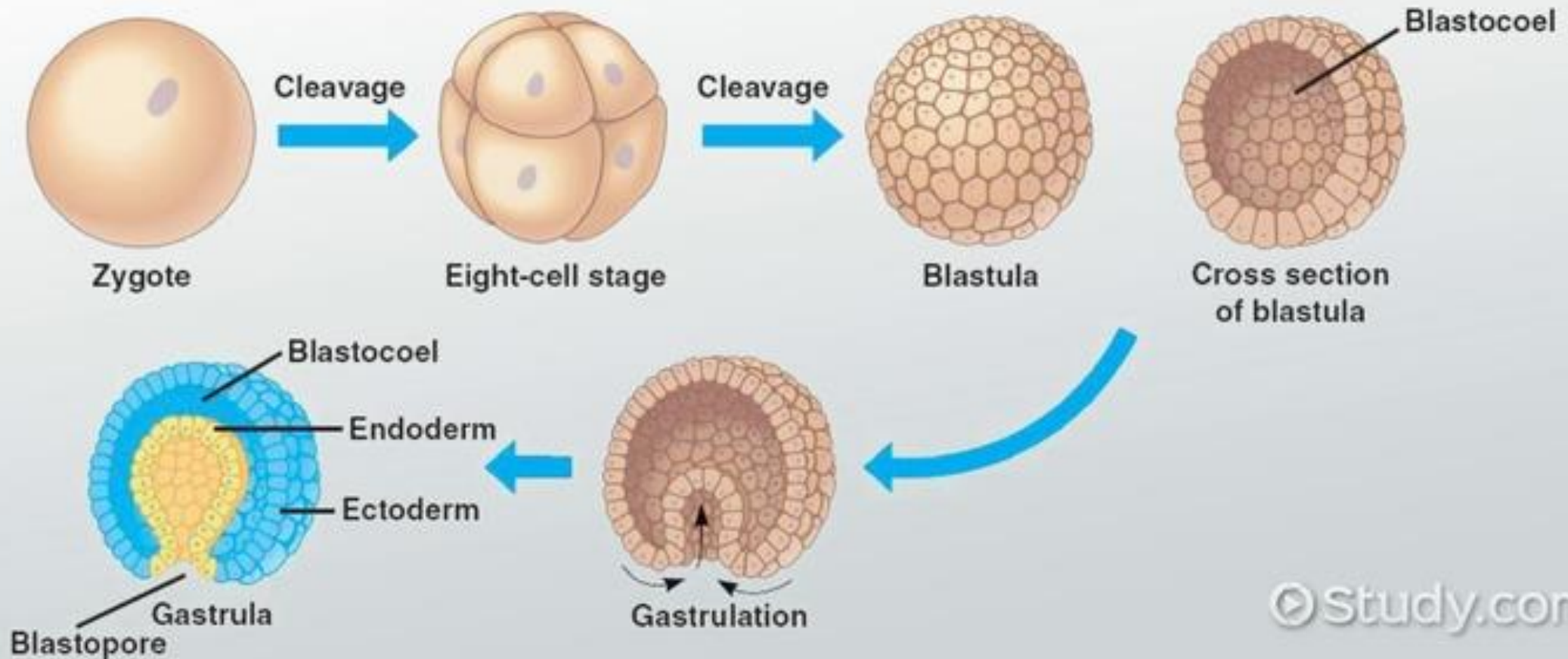
## Gastrulation

- **Invagination of cells**
- **Blastopore and Archenteron**
- **Pyramidal shape of the embryo**
- **Anterioposterior axis develops**
- **Coelom forms**

**“Morphogenesis”\_Pluteus larva**

# cleavage

*rapid cell division that leads to a multicellular embryo*



# Vertebrate Embryology

- Similarities to Echinoderms

## Chordate Body Plan

- Phylum Chordata:
- Fate of ectoderm
- Neural tube, brain
- Mesoderm, The notochord
- Pharyngeal slits

# Amphibian Embryology

## Initial Cleavage:

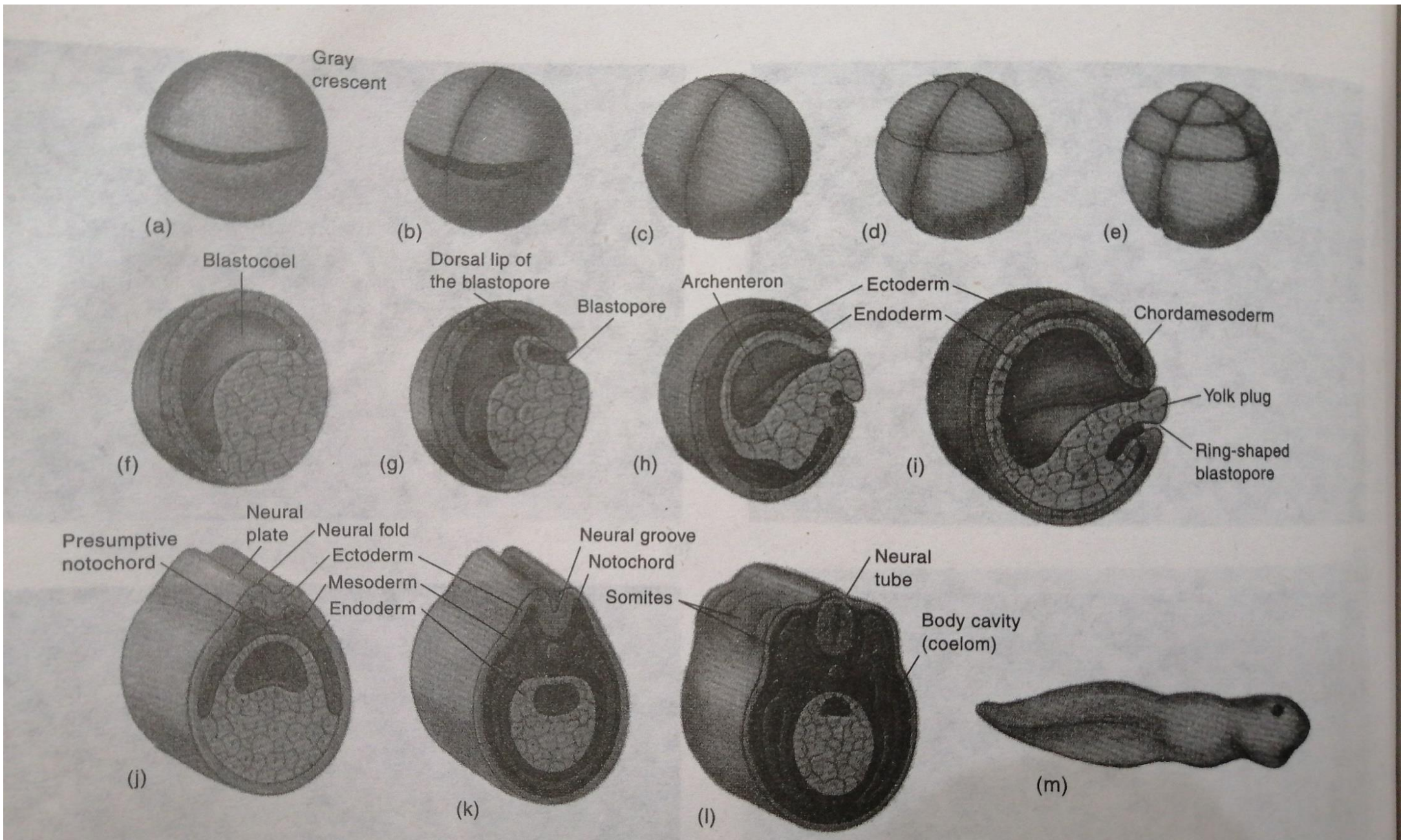
- Longitudinal
- Small cells at animal pole and large cells at vegetal pole
- Blastocoel in animal half
- Blastula wall multiple cell layers



# Amphibian Embryology

## Gastrulation:

- Groove formation
- Dorsal lip
- Involution
- Yolk plug
- Closing of blastopore
- Epiboly



# Amphibian Embryology

## **Mesoderm Formation:**

- Presumptive notochord
- Presumptive mesoderm
- Chordamesoderm

## **Neural tube formation:**

- Neurulation
- Presumptive neural tube

# Development in Terrestrial environments

Reptiles

Birds

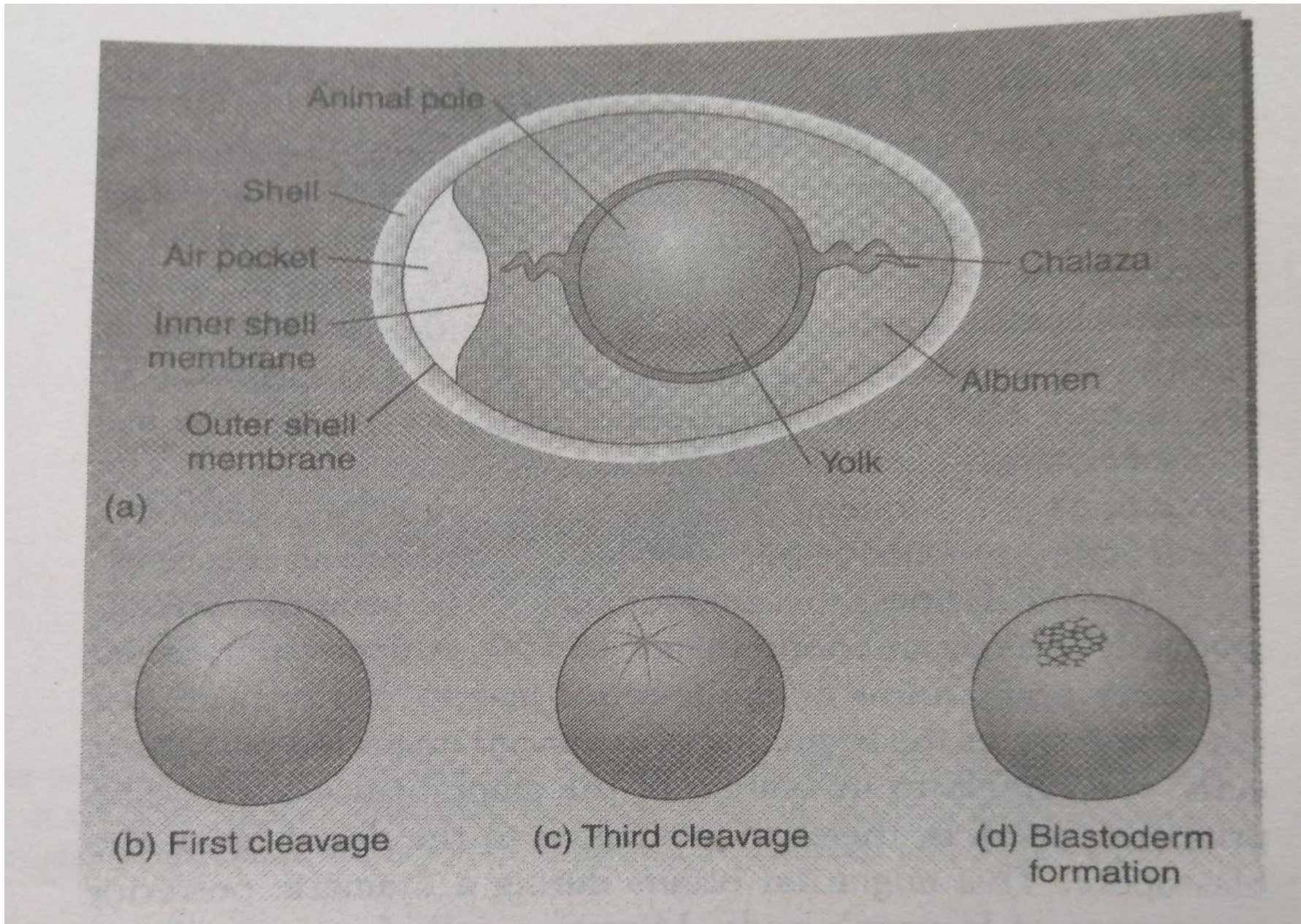
Mammals

# Avian Embryology

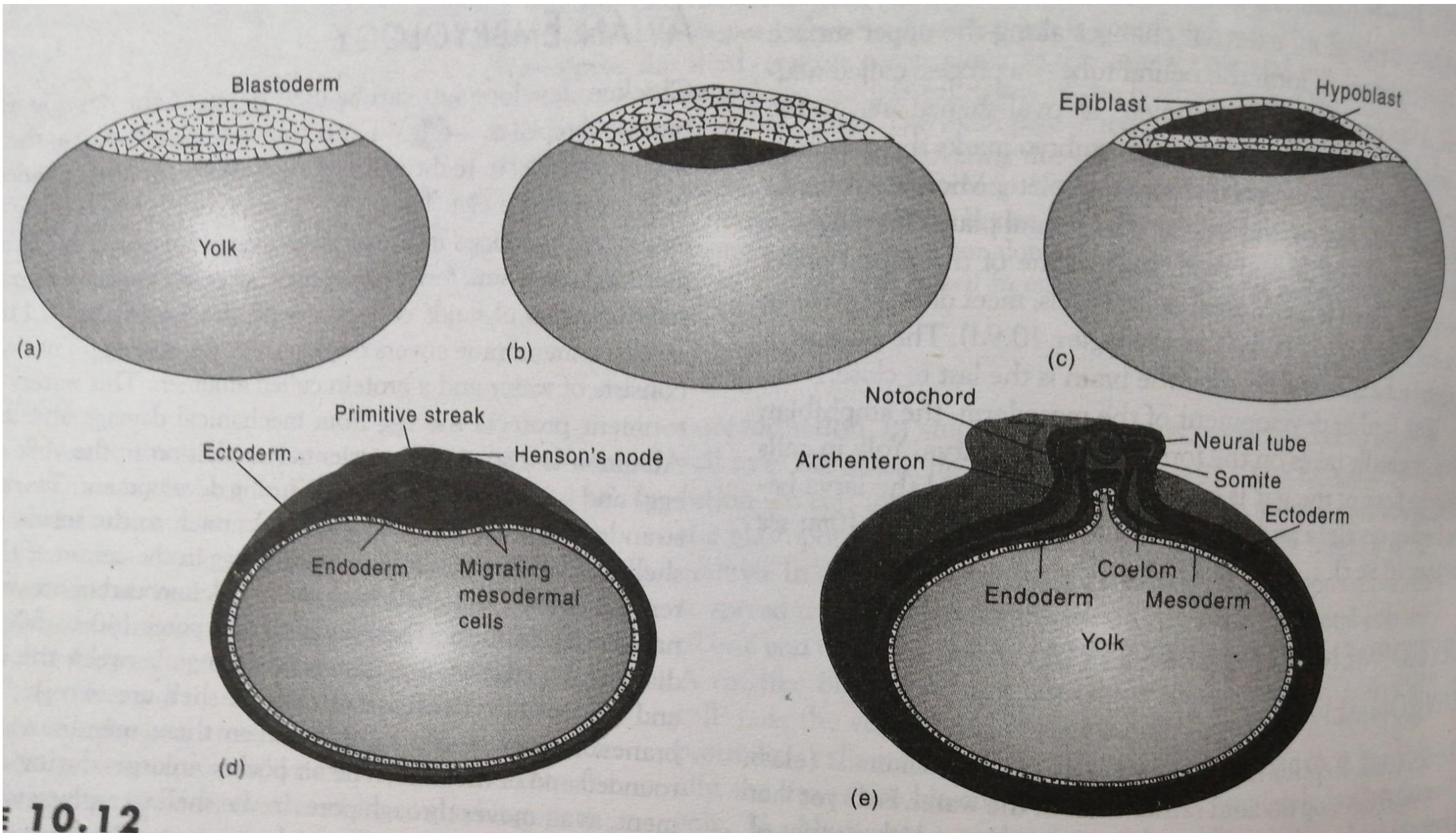
## Early Cleavages and Gastrulation

- Blastoderm
- Epiblast
- Hypoblast
- Primitive streak
- Henson's node





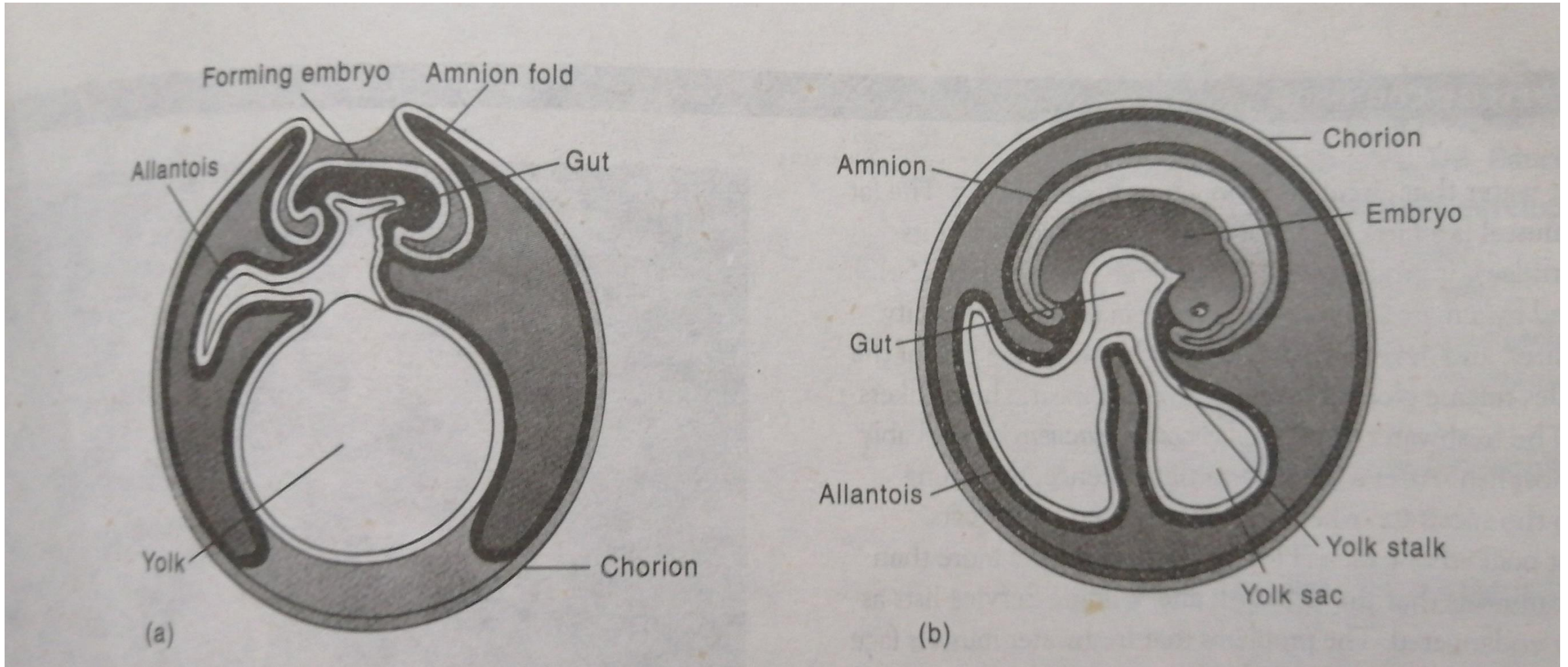




# The development of Extra Embryonic membranes

- Yolk sac
- Amnion
- Chorion
- Allantois





# The fate of Mesoderm

- Supportive tissues
- Muscles
- Derivatives of other primary germ layers