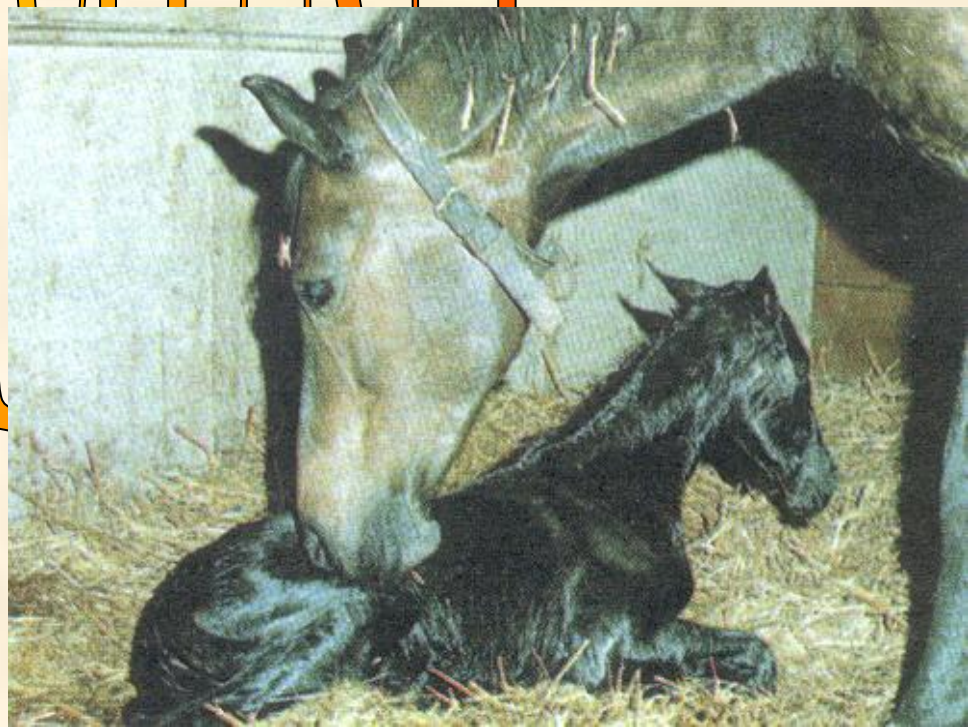


DEVELOPMENT



- After fertilization a diploid cell forms which is called zygote.
- Zygote develops into new organism in anywhere.
- This process is called development.

Animal Development

- In animal development, there are four steps. These are:

- Cleavage
- Morula
- Blastula
- Gastrula
- Organogenesis

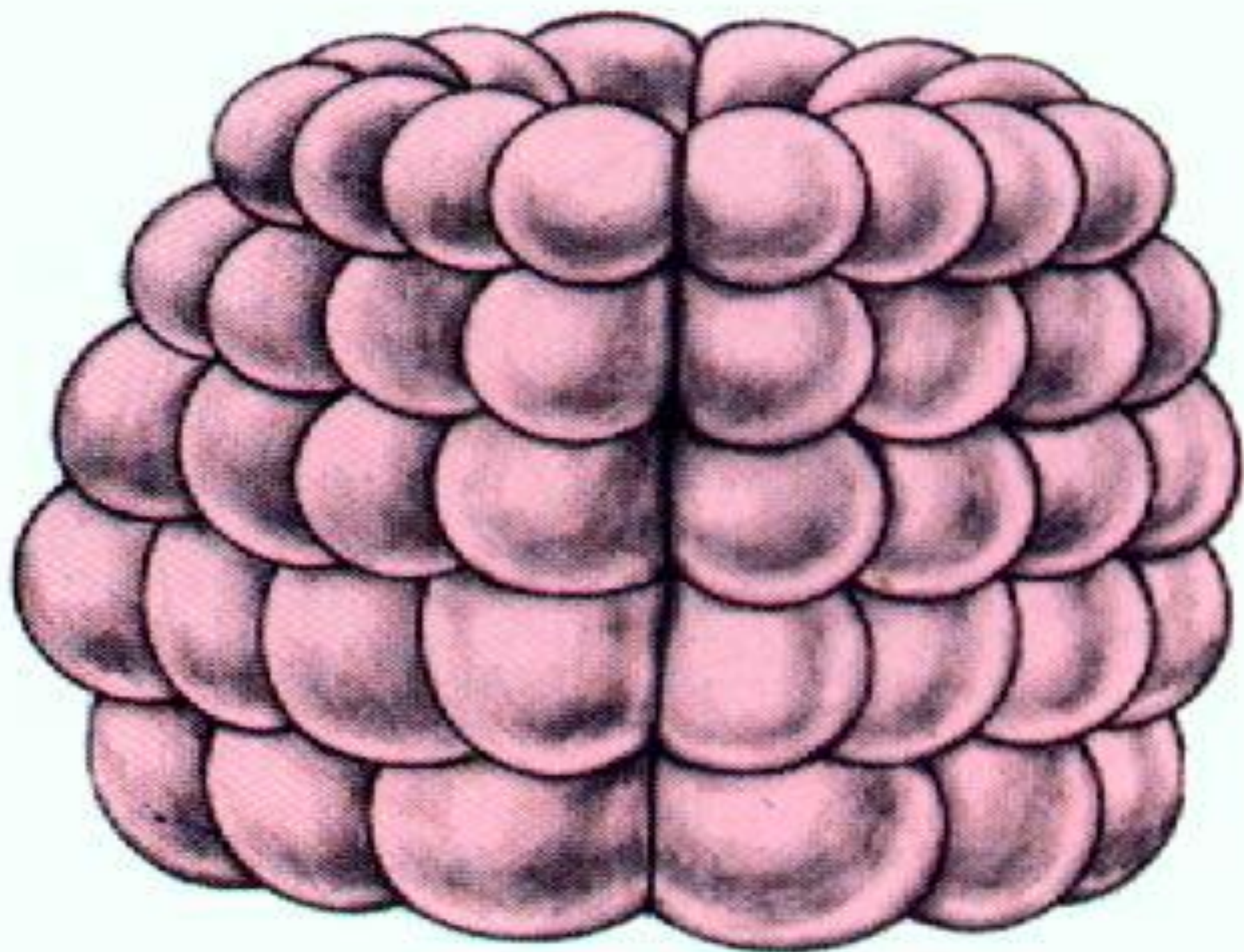
cleavage

- After fertilization, zygote starts the first of mitotic cell division.
- Formation of two cell from zygote is known as **cleavage**.
- These cells are called **blastomers**.



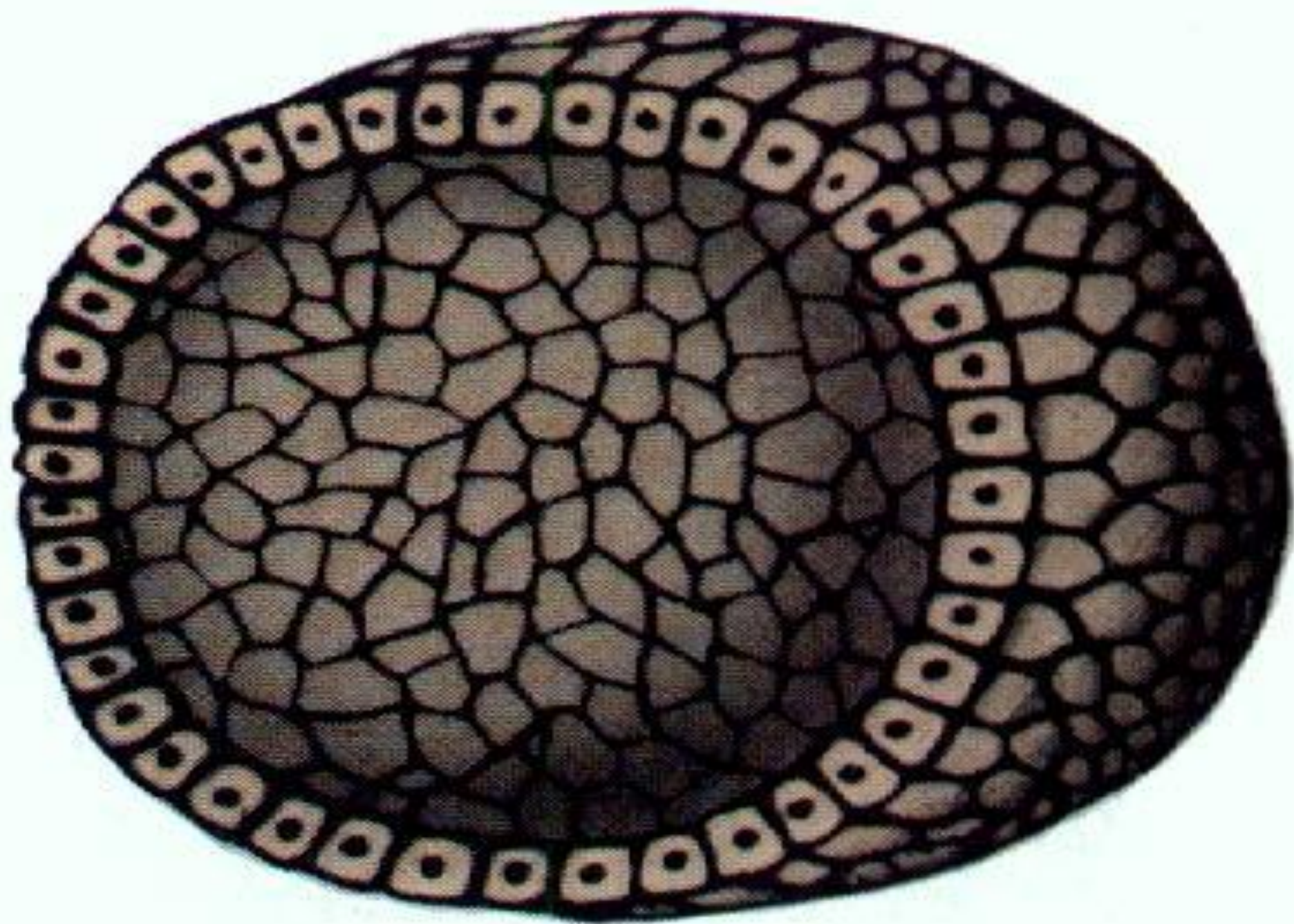
morula

- **Each blastomere divides repeatedly until 32 cells are formed.**
- **This group of cells is called morula.**



blastula

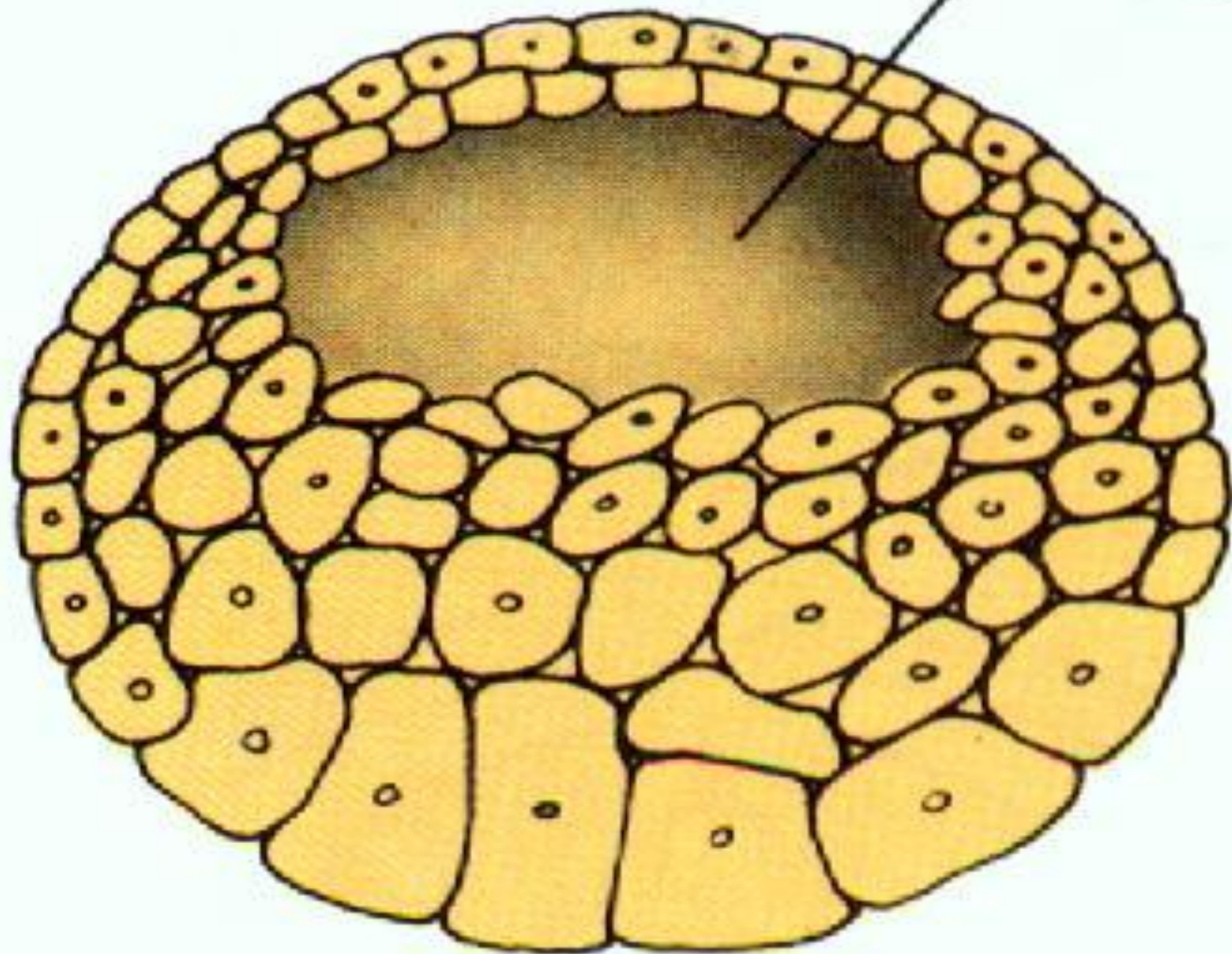
- **After morula, cells continue divide mitotically and forms ball like structure which is called blastula.**
- **In blastula, several hundered cells are formed around a cavity filled with fluid.**



GASTRULA

- After blastula some cells migrate. Inner portion of ball and 3 different layer are formed.
- This three layered structure is called **blastula**.
- These layers are **Endoderm, Ectoderm and Mesoderm**.

blastocoe



Organogenesis

- After formation of these layers each layer differentiate into organs and tissues.
- This process is called differentiation.

During differentiation

- **Ectoderm develops into ;
Endocrine glands,
Nervous system, and Skin.**

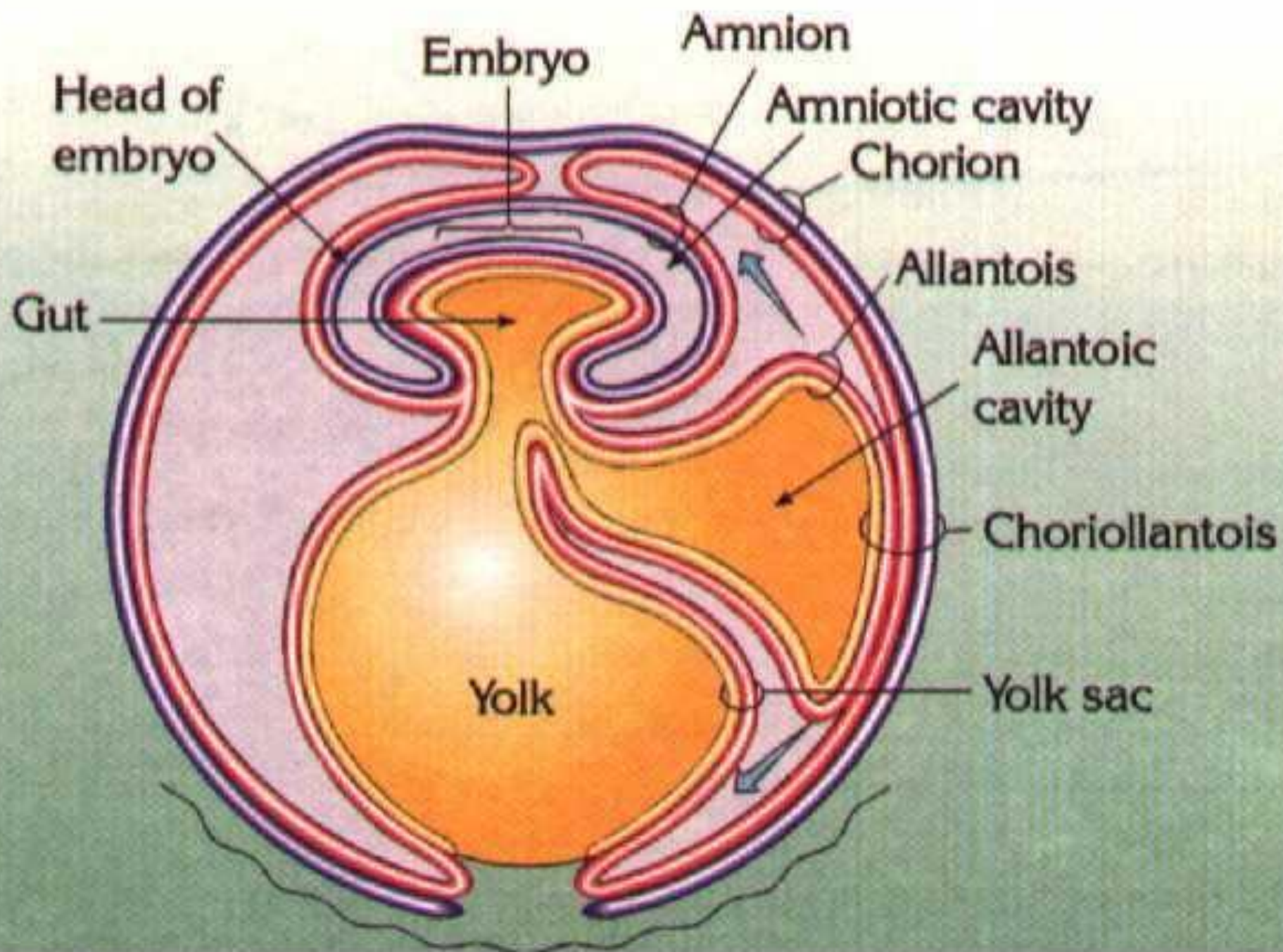
- **Mesoderm develops into;
Blood, Skeletal system,
Muscles, Circulatory system,
Excretory system, and Gonads.**

- **Endoderm develops into;
Digestive system, respiratory
system, pancreas and liver.**

Extraembryonic

Membranes

- **1. Shell:** Some animals lay egg with shell. Shell contains CaCO_3 and it protects the embryo.
- It forms in oviduct after fertilization which is impermeable to water but permeable to gases.
- Shell is seen in reptiles and birds.



The Chorion

- It is located under the shell.
- Chorion allows gas exchange.

3. The Allantois: It is a sac which stores excretory substances.

- It is large in reptiles and birds and small in mammals.

Vitellus (Yolk Sac)

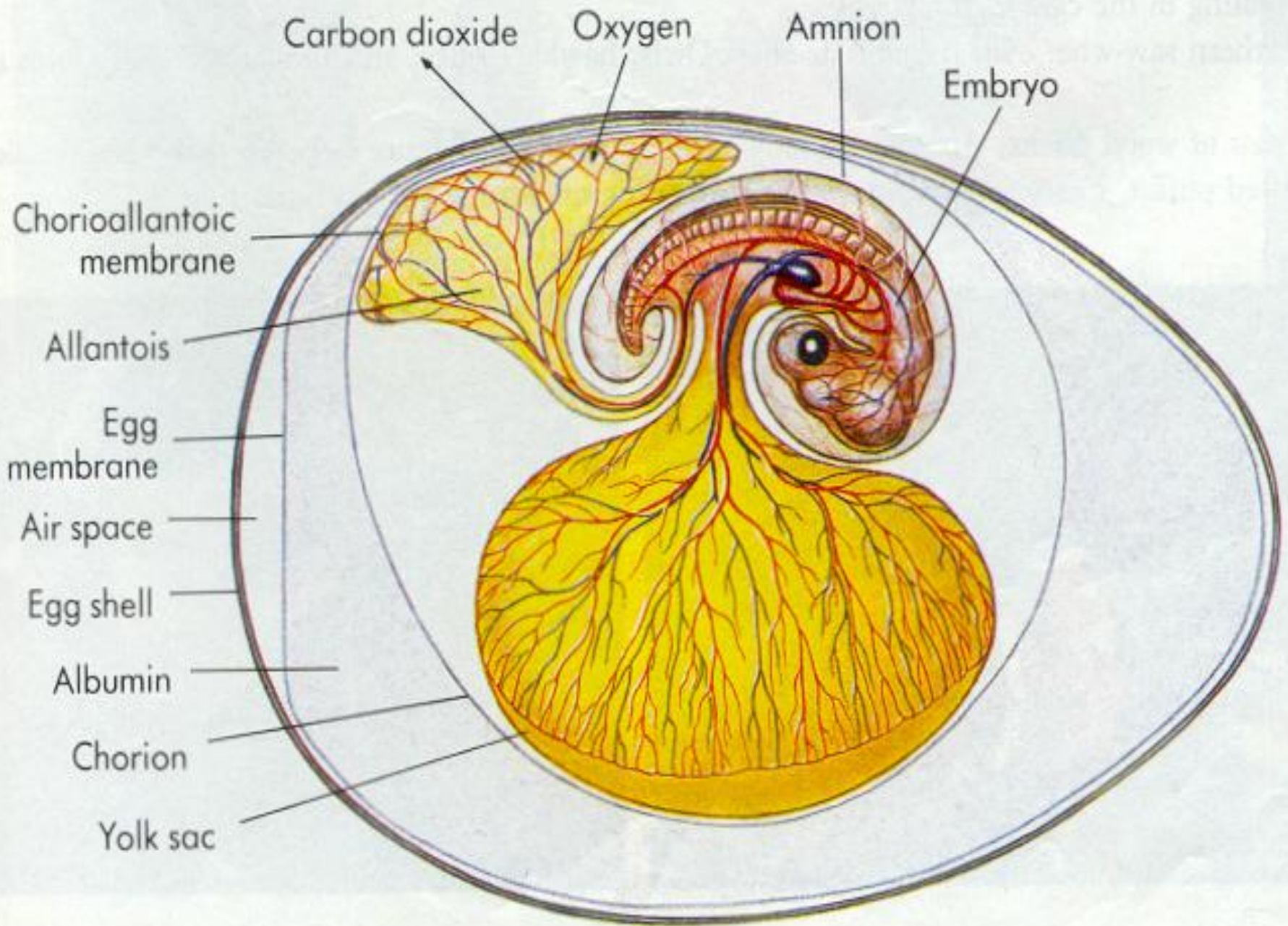
- Yolk sac store protein, lipid and carbohydrates.
- It is large in reptiles and birds. But small in mammals. Because mammals embryo take nutrients from its mother.

The Amnion:

- Amnion is filled by amniotic fluid.
- It supports the embryo.

6. Placenta: Placenta is a link between embryo and mother which nutrient, and hases may pass.

- It has rich small blood vessels.



DEVELOPMENT

in

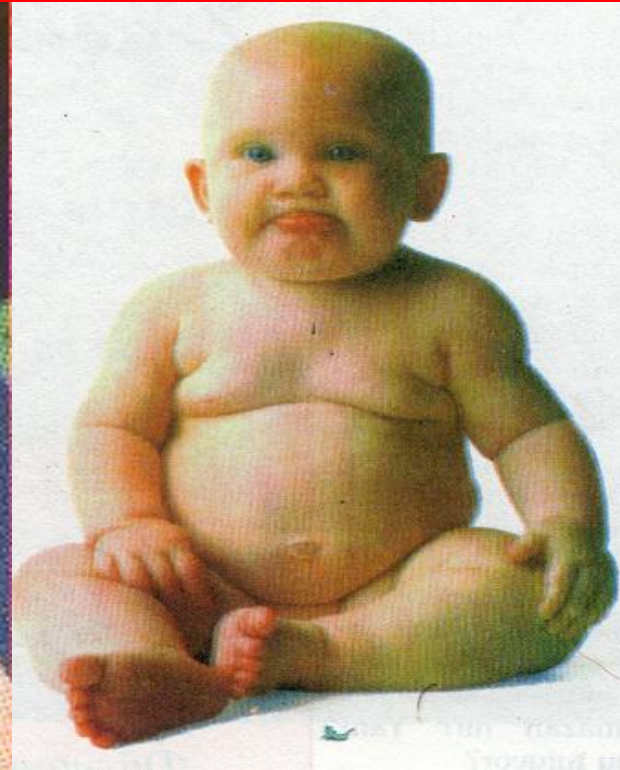
HUMAN

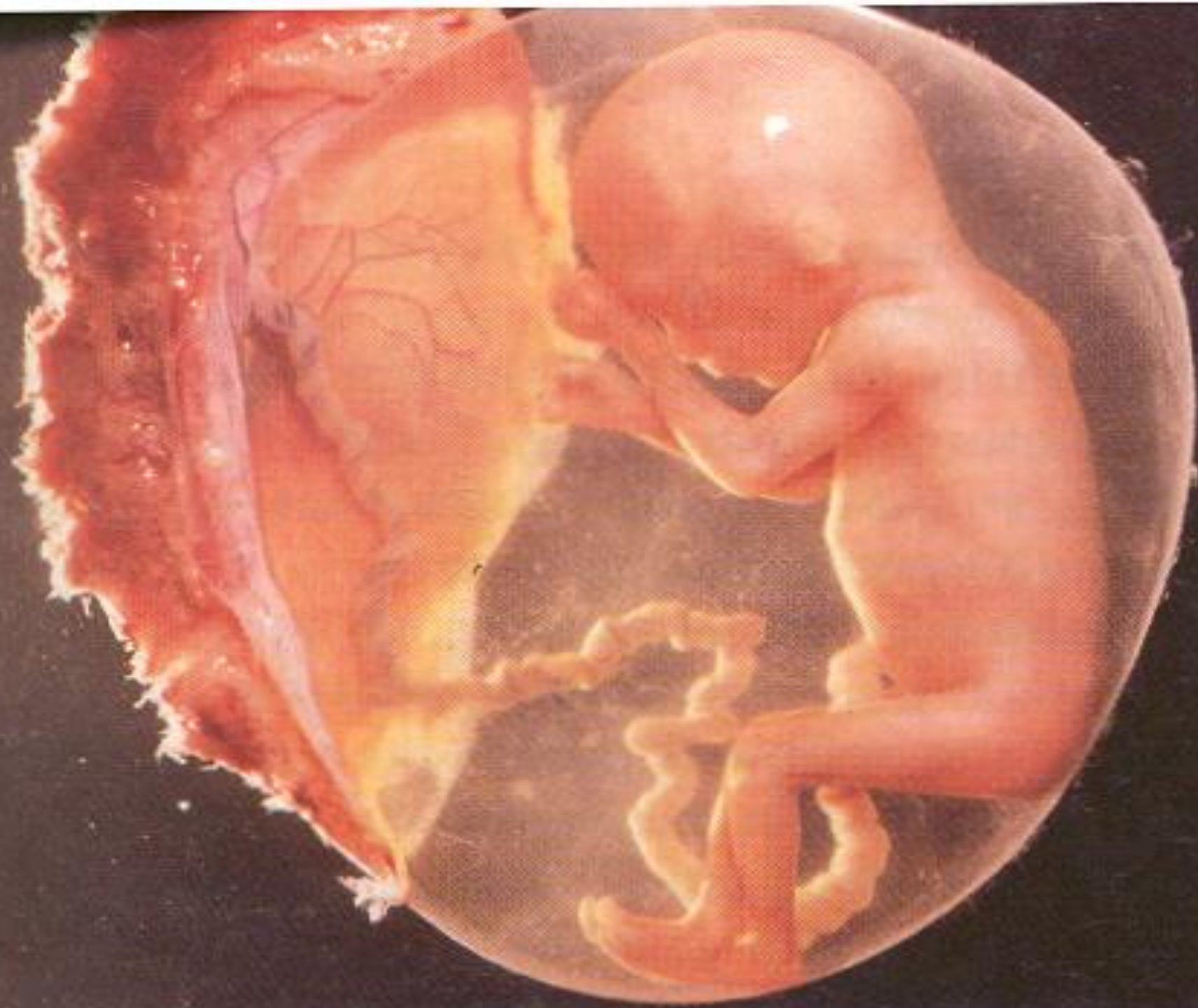
- **In human fertilization occurs in the fallopian tube.**
- **After fertilization, zygote starts division mitotically. However it is moved toward uterus by cilia.**

- **Implantation takes place 7 days after fertilization in uterus.**

In first months placenta forms.

**Also after 266 days
child birth.**



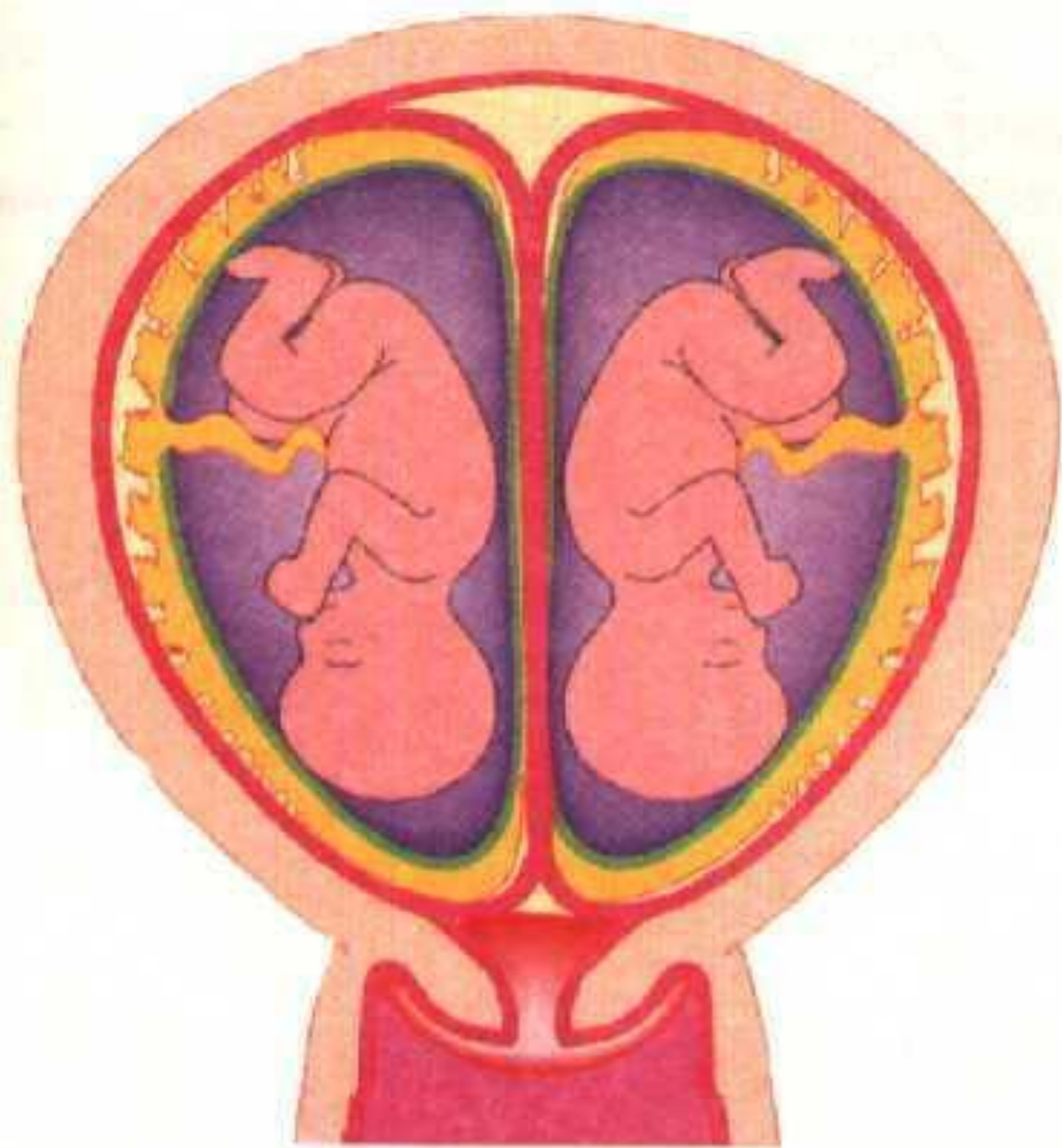


MULTIPLE BIRTHS

- **A) FRETERNAL TWINS:**

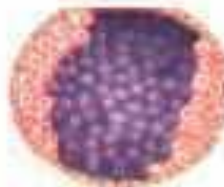
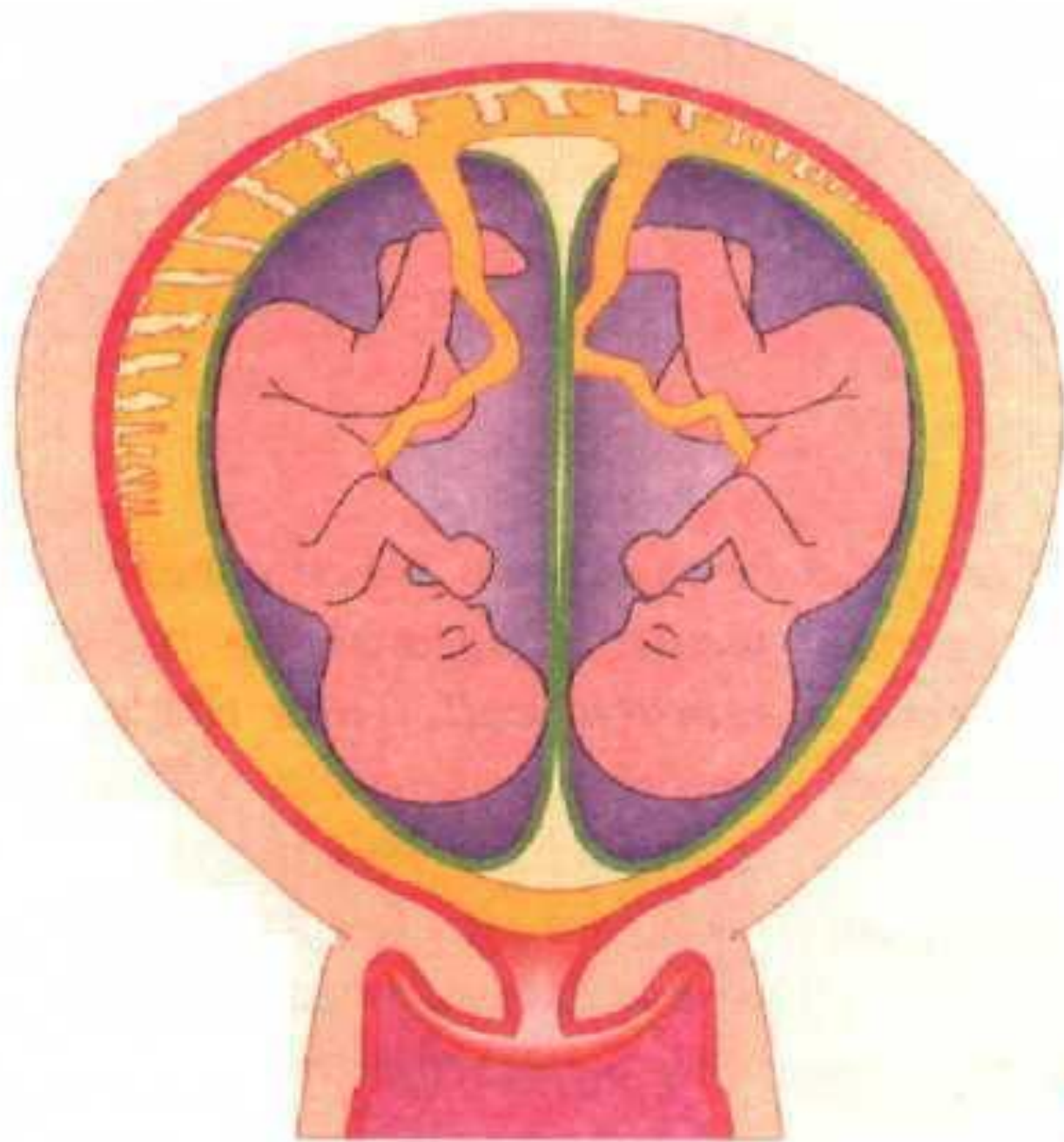
In some woman both of two ovary produce egg in month.

- **If there are sperms in oviduct at ovulation time. Two eggs are fertilized by two different sperms.**
- **They implant at different sites of uterine wall and develops independently.**



IDENTICAL TWINS

- After formation of zygote from one egg and sperm. It divides mitotically.
- Group of cell splits into two parts in blastula stage.
- Each group of cells develop into a child independently.
- Identical twins have identical properties.





WONDERFULL facts

About Reproduction

- **The offspring of Black Bear is about 300 grams at birth.**
- **The heaviest offspring is African Elephant, 110 kilograms.**
- **The smallest offspring is Kangaroo, 0,75 grams.**

- **The longest gestation periods of development is seen in Indian Elephant, 607-641 days.**
- **The least gestation periods of development is seen in Opossum; 13 days.**

- **The mice reach the ability to reproduce 35-49 days after birth.**
- **The whale can reach the ability to reproduce 6-12 years after birth.**
- **Human can reproduce 12-15 years after birth.**

- **The highest number of offspring in one birth is seen in rabbits;
–15 offsprings in one birth.**

