

课程实验

要求：

- 1。 必须准时到。
- 2。 穿白大褂。
- 3。 不得打闹。
- 4。 写实验报告（ 纸质 ）

注意事项

- 胆子大一点

实验报告

实验名称：

学 号：

姓 名：

实验地点：

实验时间：

实验目的

•

实验设备

•

实验内容

•

实验步骤

实验结果

• 数据

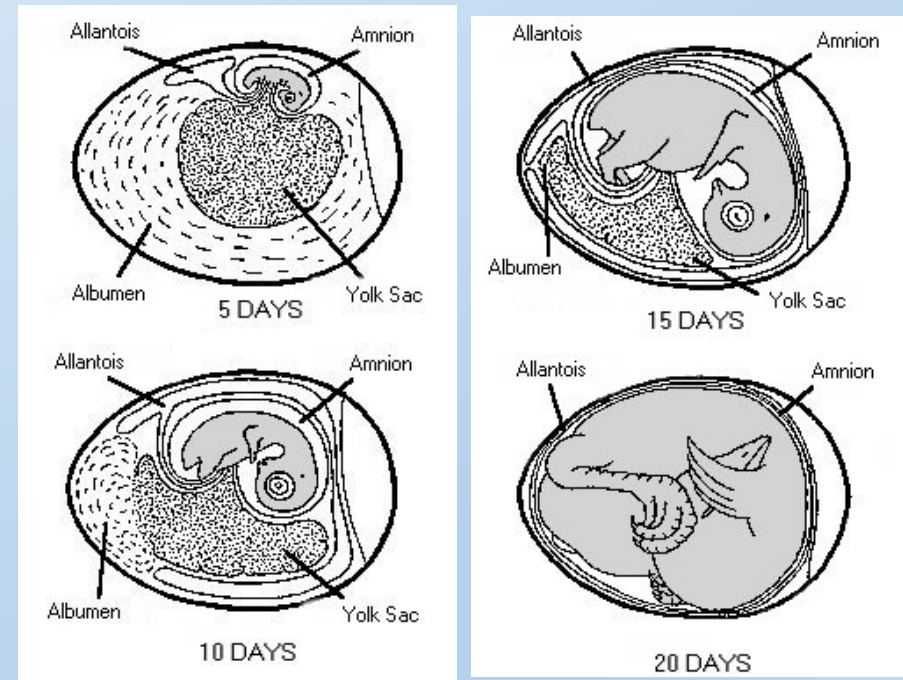
• 图表

结果分析与结论

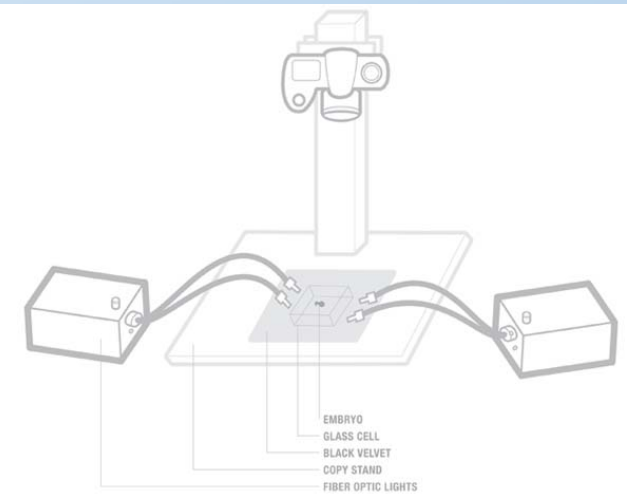
天数	操作	温度	湿度	现象	状态	

实验1 小鸡孵化

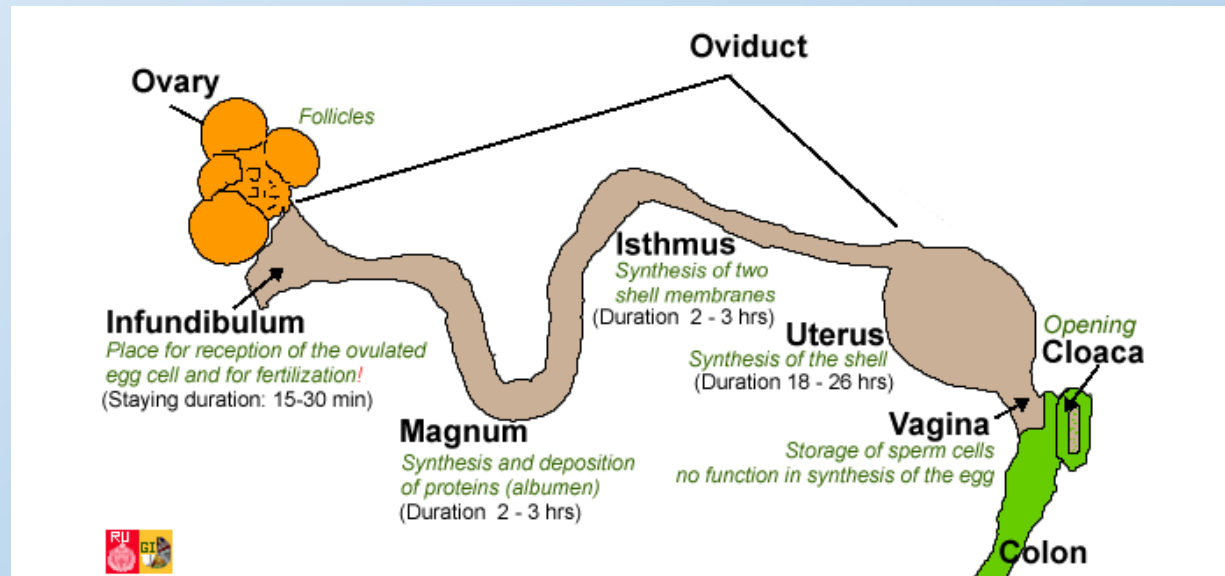
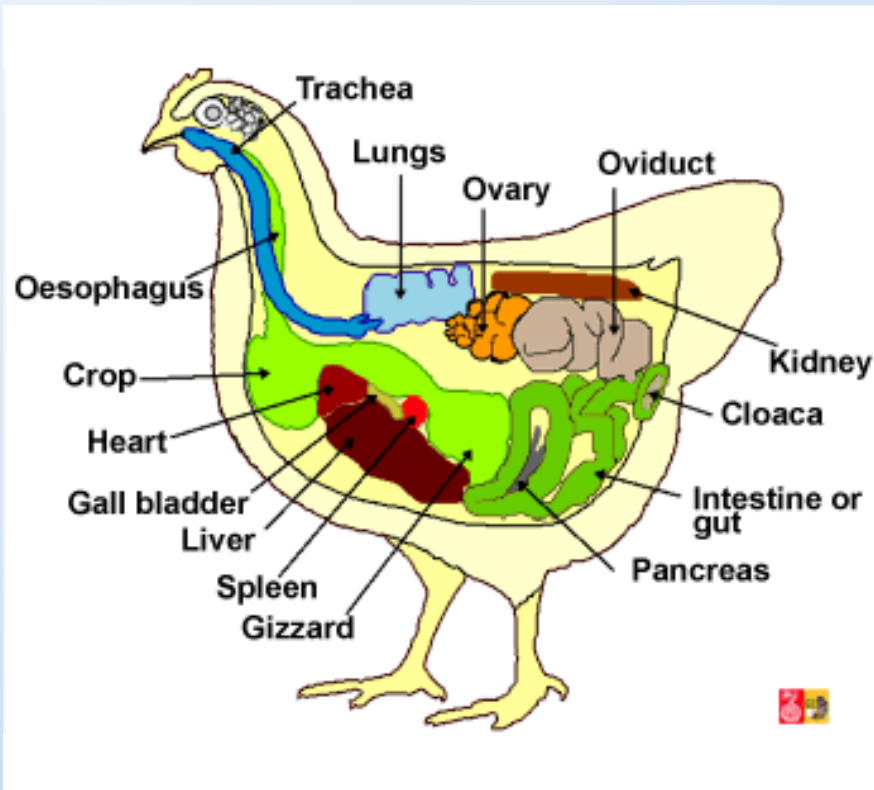
- 观察胚胎发育的过程
- 需要21天
- 每次实验观察记录



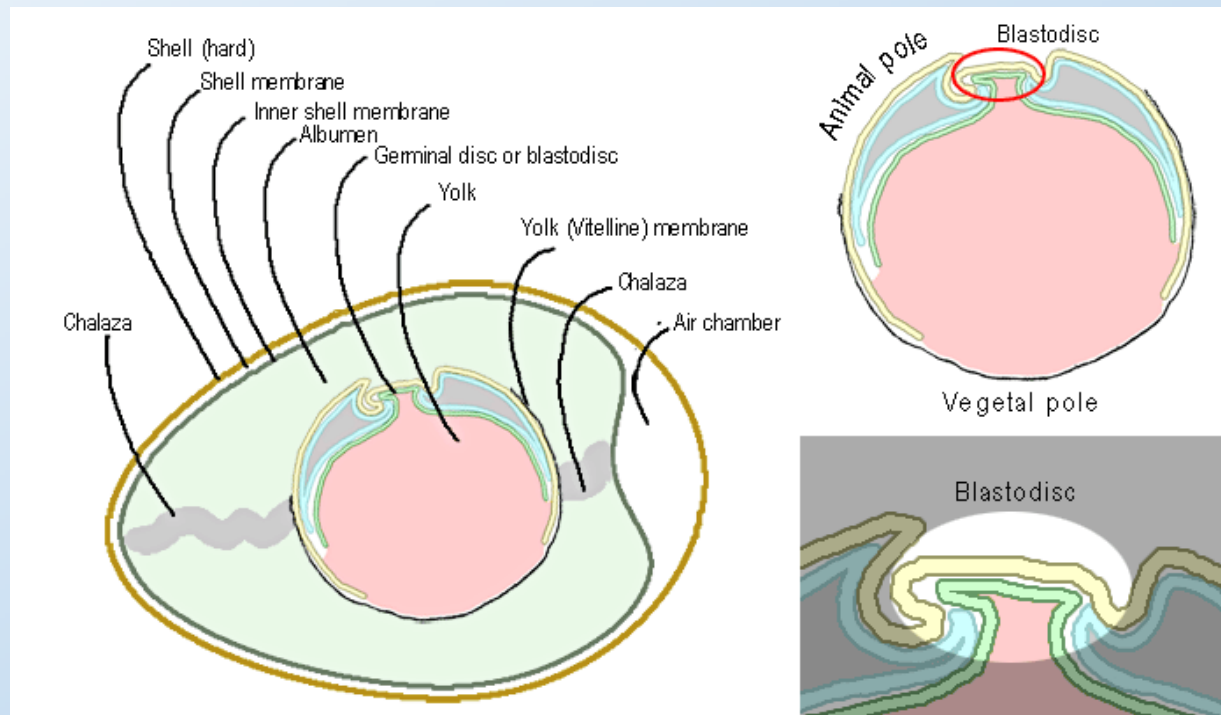
家鸡胚胎



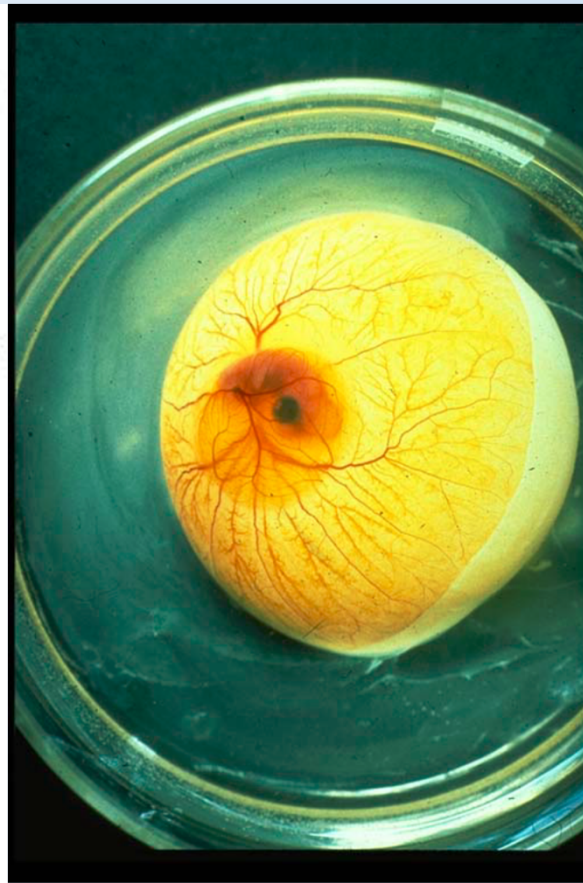
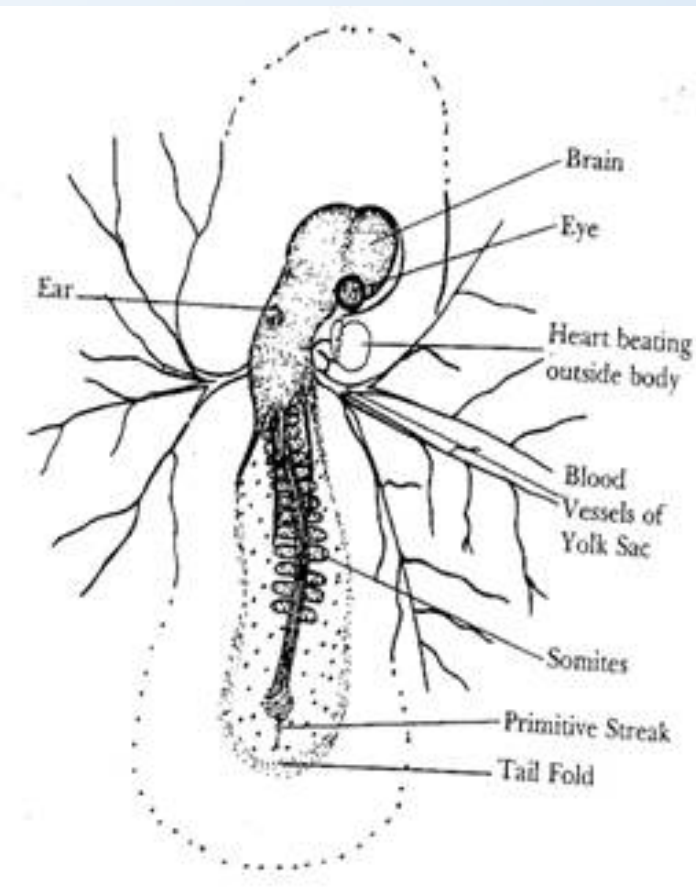
家鸡



鸡蛋



Model of Embryo



2-day

时间 : 21天
温度 : 37.8度 36.5-38.5
湿度 : 40-70%
通风 : $\text{CO}_2 < 0.5\%$

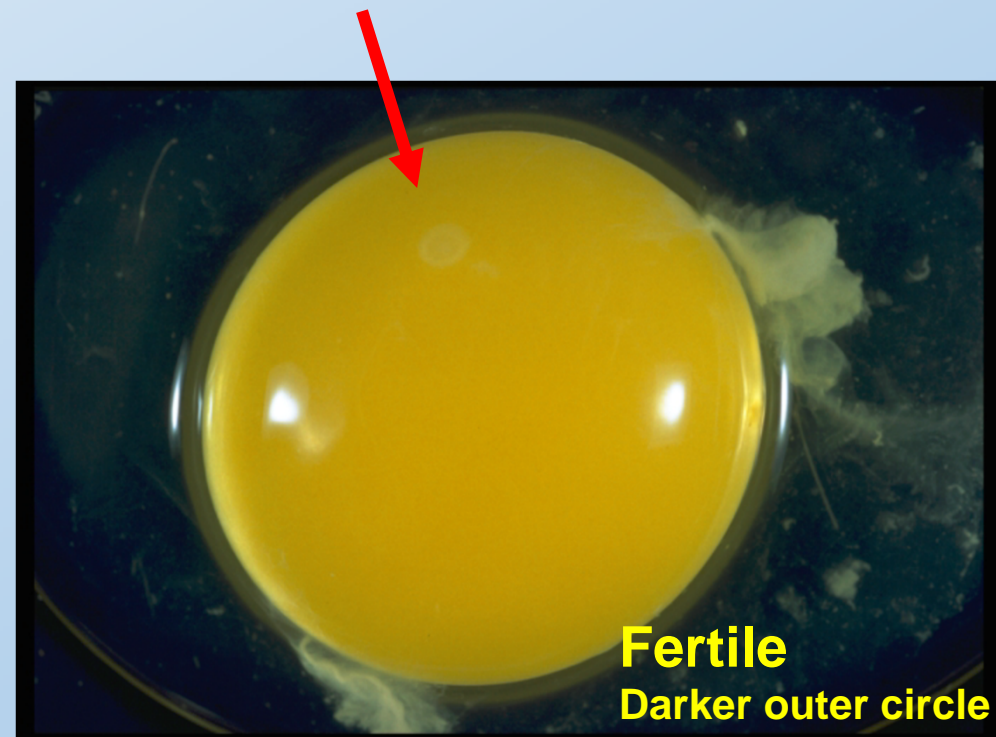
消毒
翻蛋

照蛋 : 三次
5-6 无精蛋 ,
11 死胚
移蛋时 (

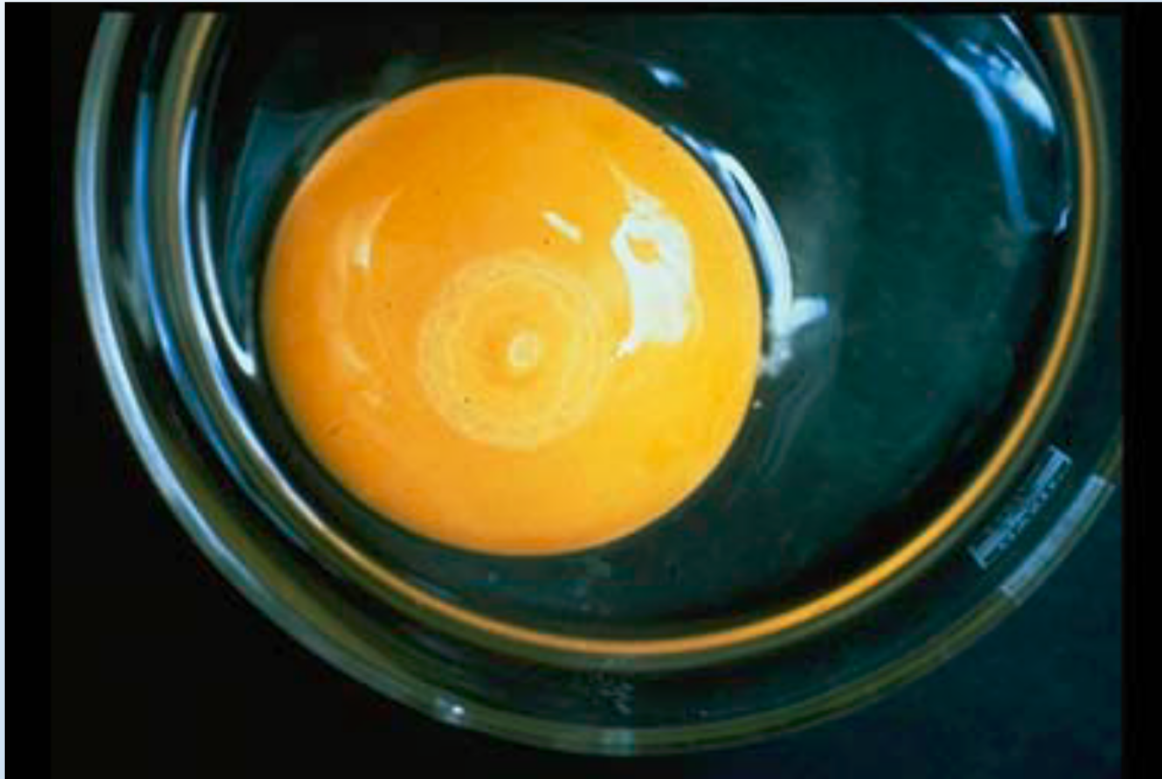
受精蛋

Physiological zero : 20 度

7 days maximum



Day 1, 2



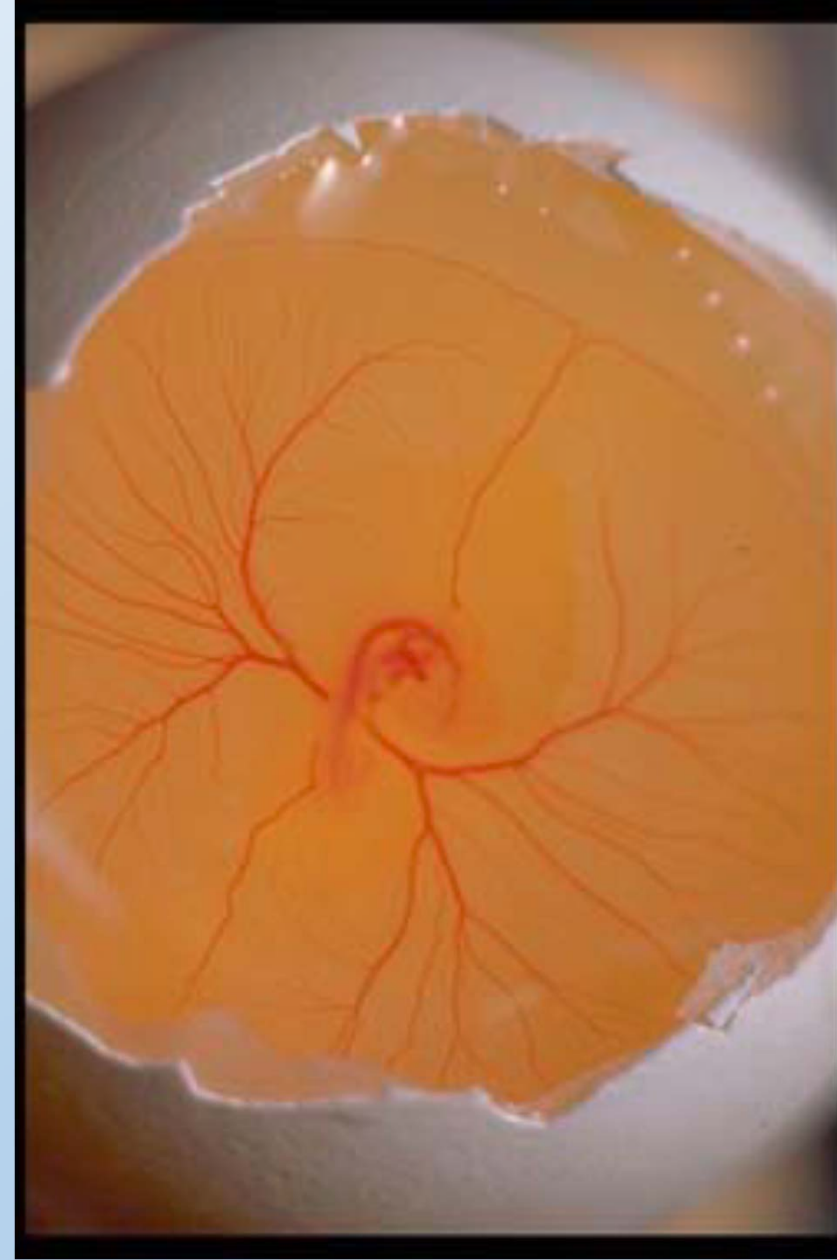
3 Day Embryo

Heart Visible

Vertebrae Column - Question Mark Shape

Amnion Complete

Brain and Head Visible

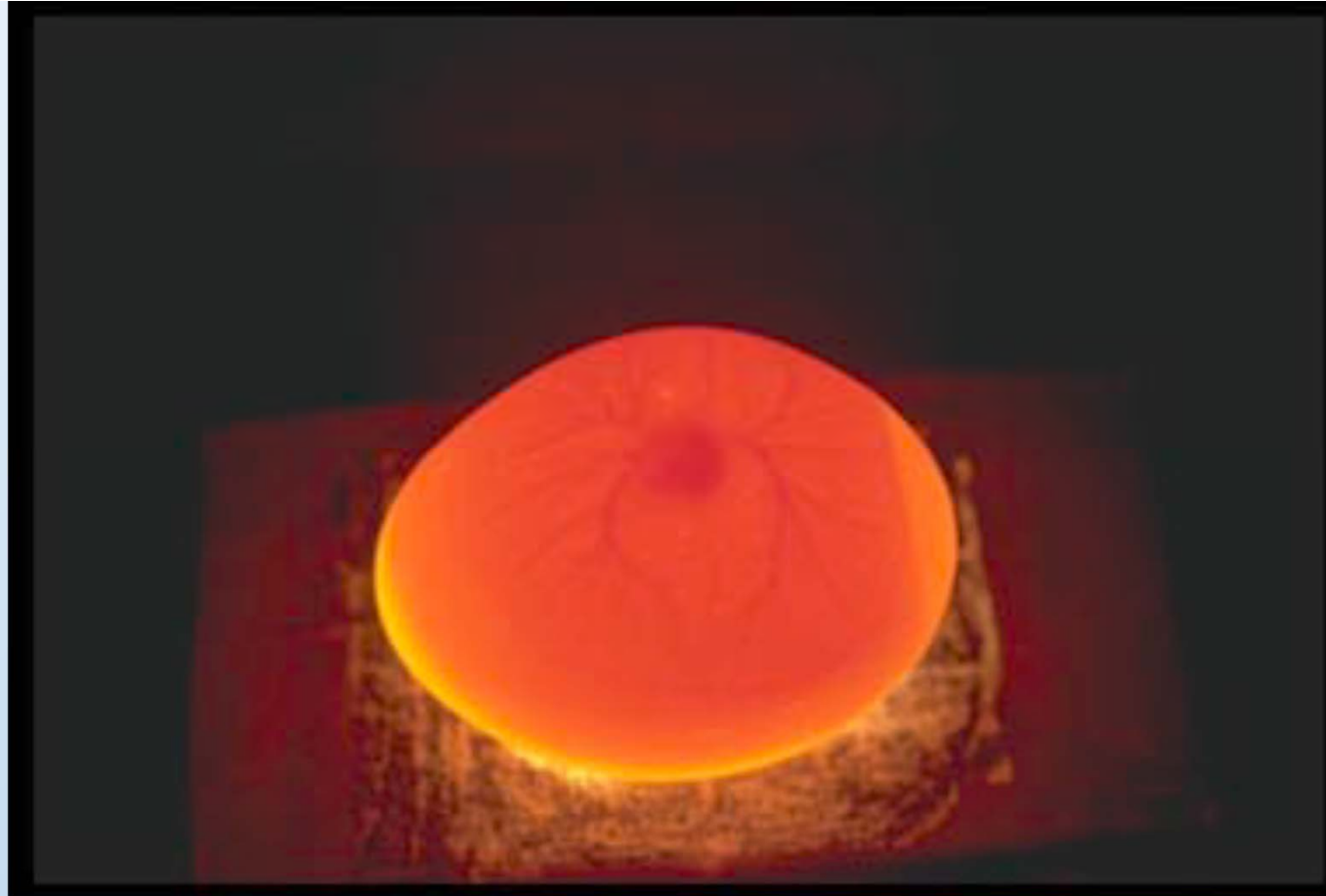


4 & 5

Embryo is completely
separate from yolk sac

Amnion clearly visible

Formation of reproductive organs
by 5th day - Sexual Division

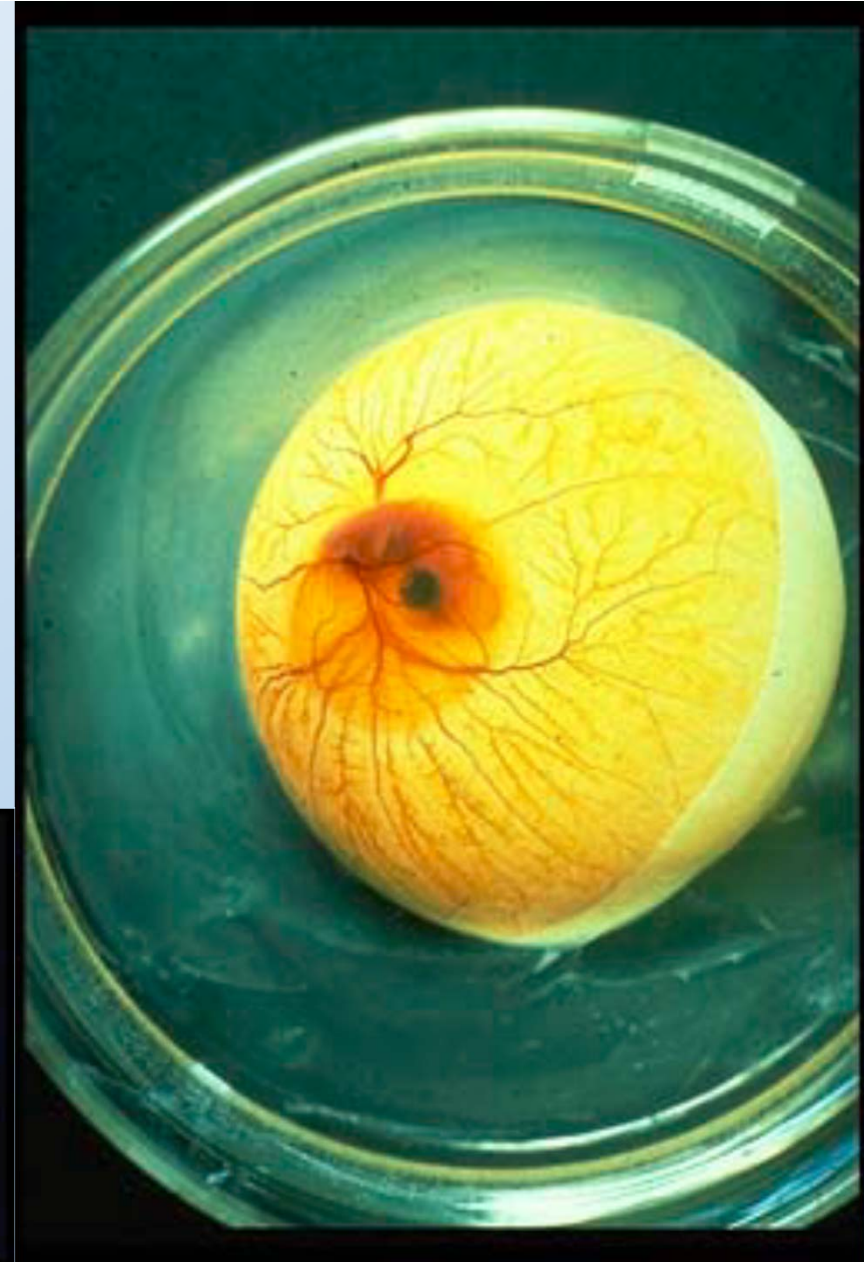


6 Day Embryo

Voluntary movement begins

Everything is present

- Organs
- Main division of limbs
- Beak and egg tooth starts

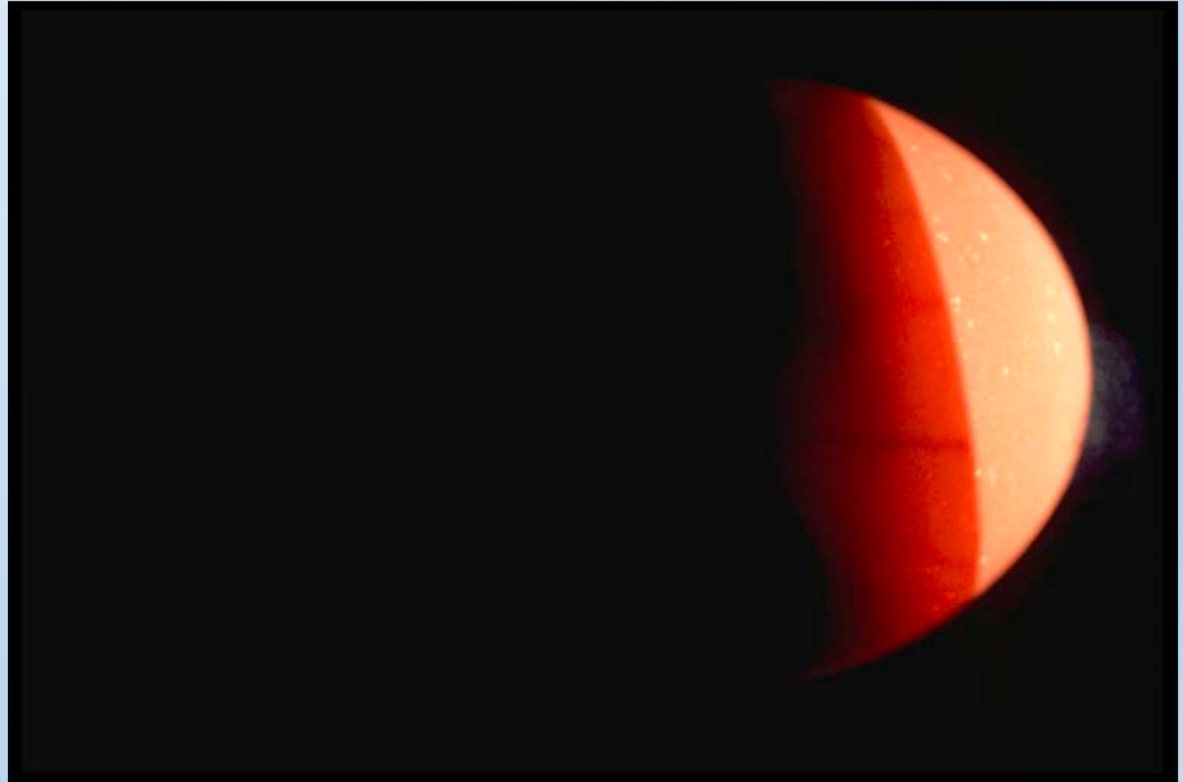


7-9

Feathers begin to form
Mouth opening appears
Embryo looks like a bird by 9th
day



After 15 days, it is very hard to observe the embryo by candling



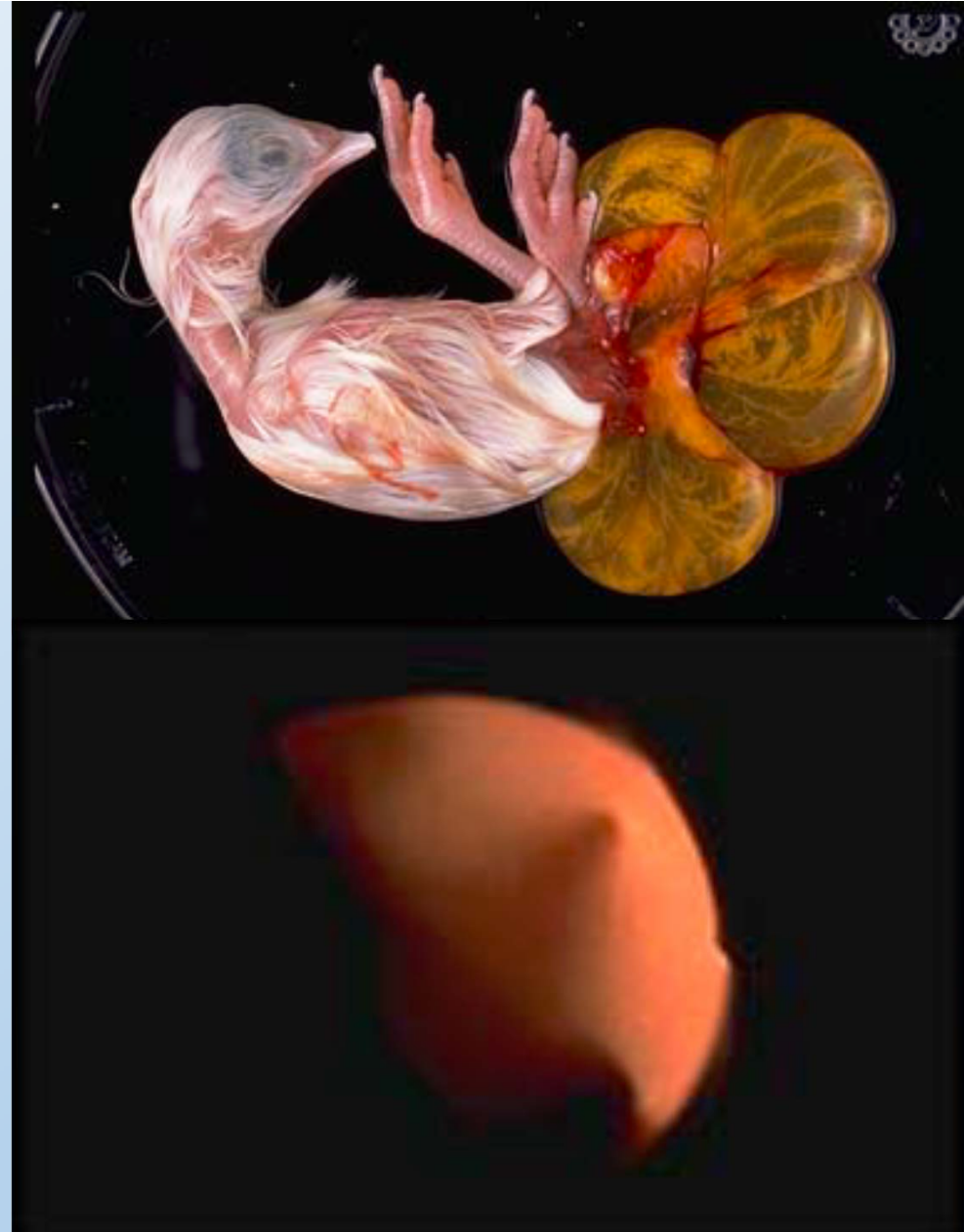
18-20

Growth complete

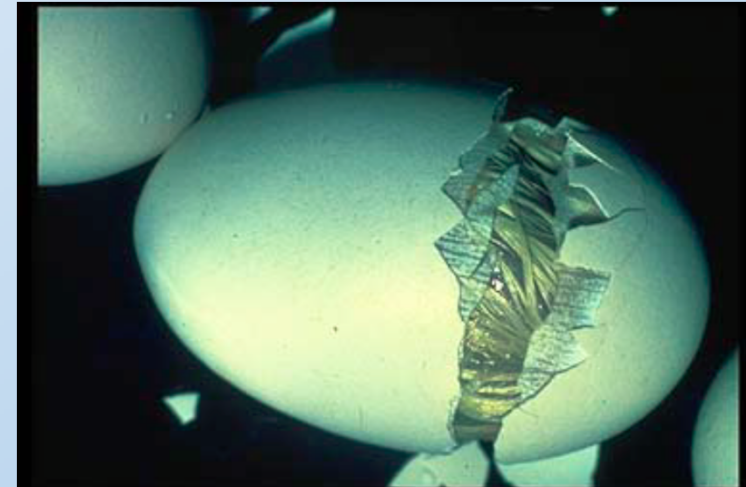
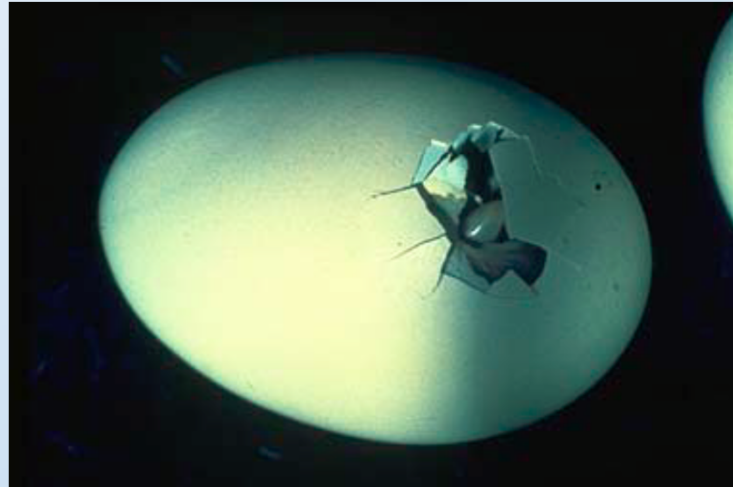
Yolk sac is drawn into body cavity

Embryo becomes a chick when it

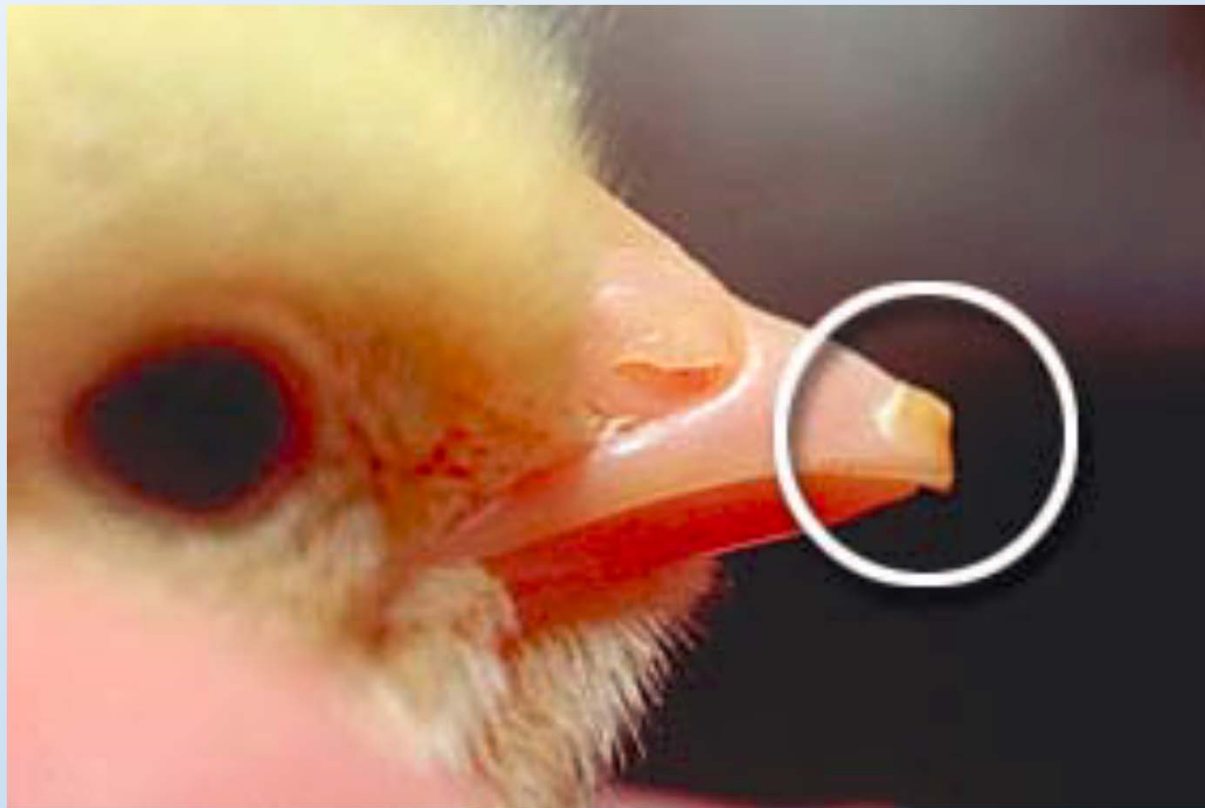
- Breaks the amnion
- Internal Pip (Into air cell)
- Starts breathing



Day 20



Observe the Egg Tooth



It is only there for first 12 to 24 hours.



CHICK EMBRYO DEVELOPMENT



INFERTILE

- No development.



DAY 1

- Appearance of tissue development.



DAY 2

- Tissue development very visible.
- Appearance of blood vessels.



DAY 3

- Heart beats.
- Blood vessels very visible.



DAY 4

- Eye pigmented.



DAY 5

- Appearance of elbows and knees.



DAY 6

- Appearance of beak.
- Voluntary movements begin.



DAY 7

- Comb growth begins.
- Egg tooth begins to appear.



DAY 8

- Feather tracts seen.
- Upper and lower beak equal in length.



DAY 9

- Embryo starts to look bird-like.
- Mouth opening appears.



DAY 10

- Egg tooth prominent.
- Toe nails.



DAY 11

- Comb serrated.
- Tail feathers apparent.



DAY 12

- Toes fully formed.
- First few visible feathers.



DAY 13

- Appearance of scales.
- Body covered lightly with feathers.



DAY 14

- Embryo turns head towards large end of egg.



DAY 15

- Gut is drawn into abdominal cavity.



DAY 16

- Feathers cover complete body.
- Albumen nearly gone.



DAY 17

- Amniotic fluid decreases.
- Head is between legs.



DAY 18

- Growth of embryo nearly complete.
- Yolk sac is still on outside of embryo.
- Head is under the right wing



DAY 19

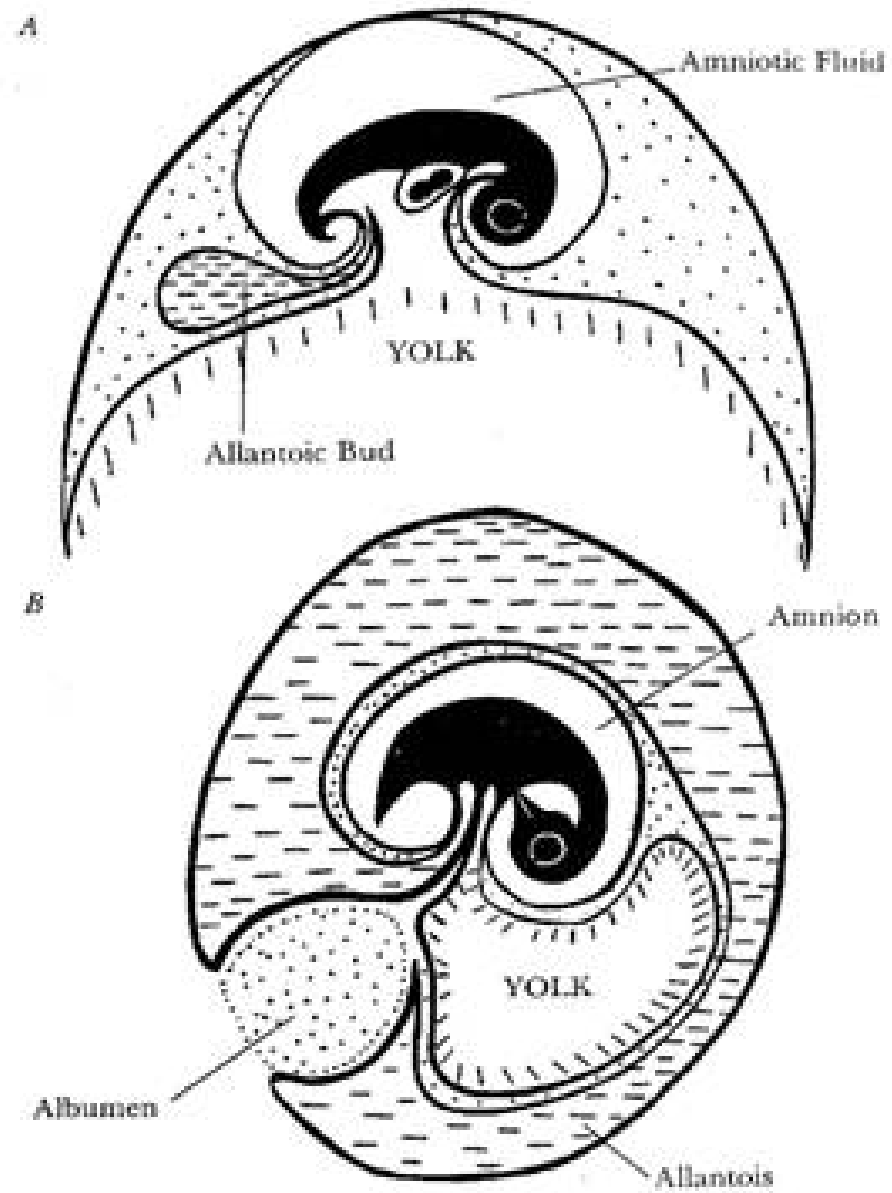
- Yolk sac draws into body cavity.
- Amniotic fluid gone.
- Embryo occupies most of space within egg (not in the air cell).



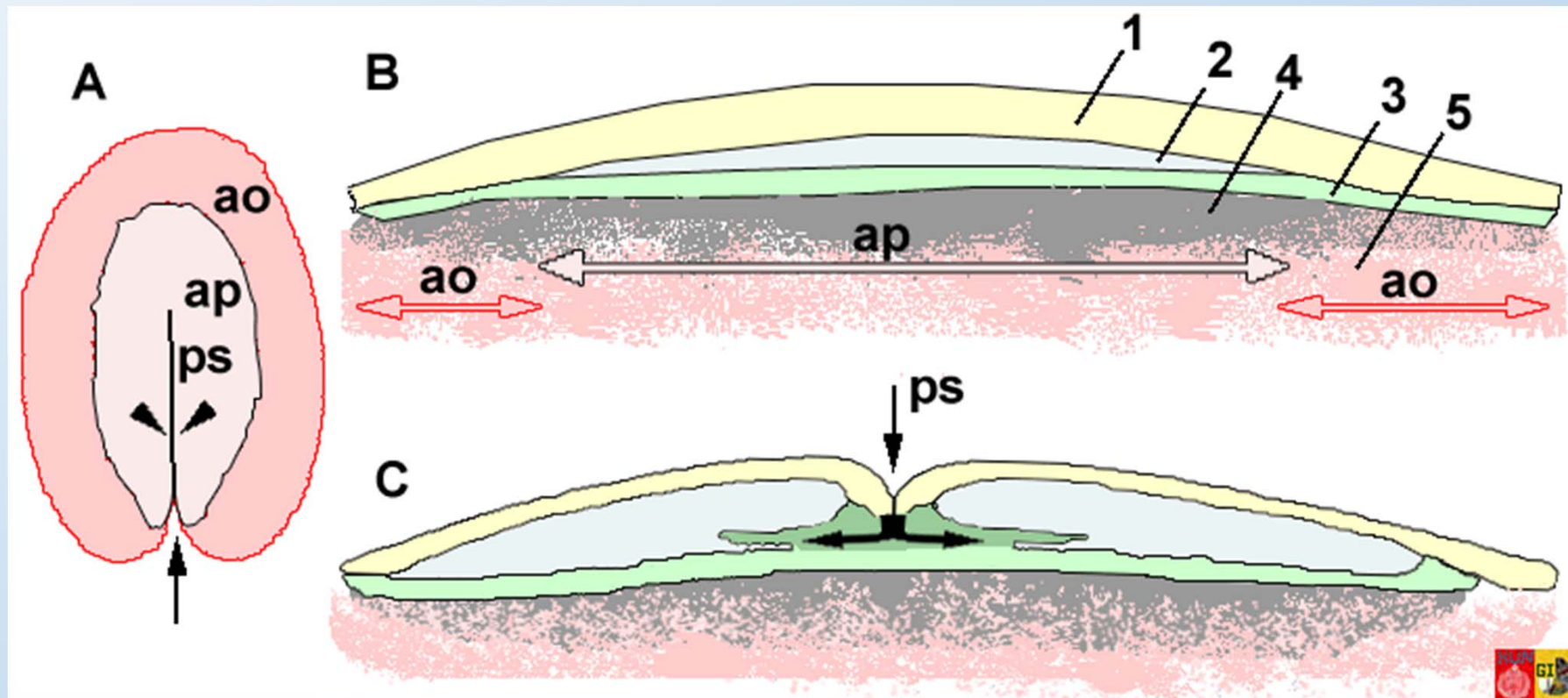
DAY 20

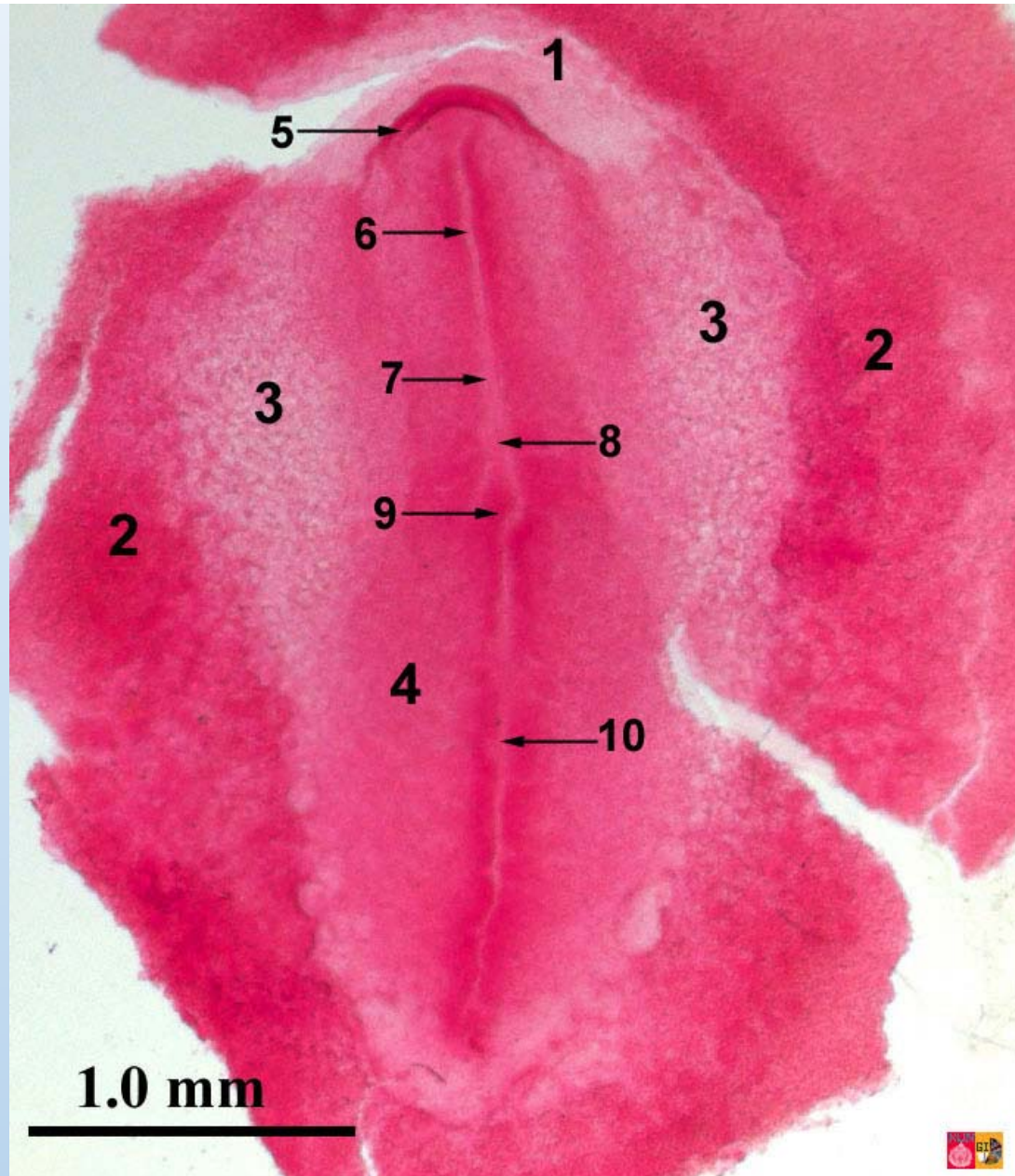
- Yolk sac drawn completely into body.
- Embryo becomes a chick (breathing in air cell).
- Internal and external pip.

羊膜动物

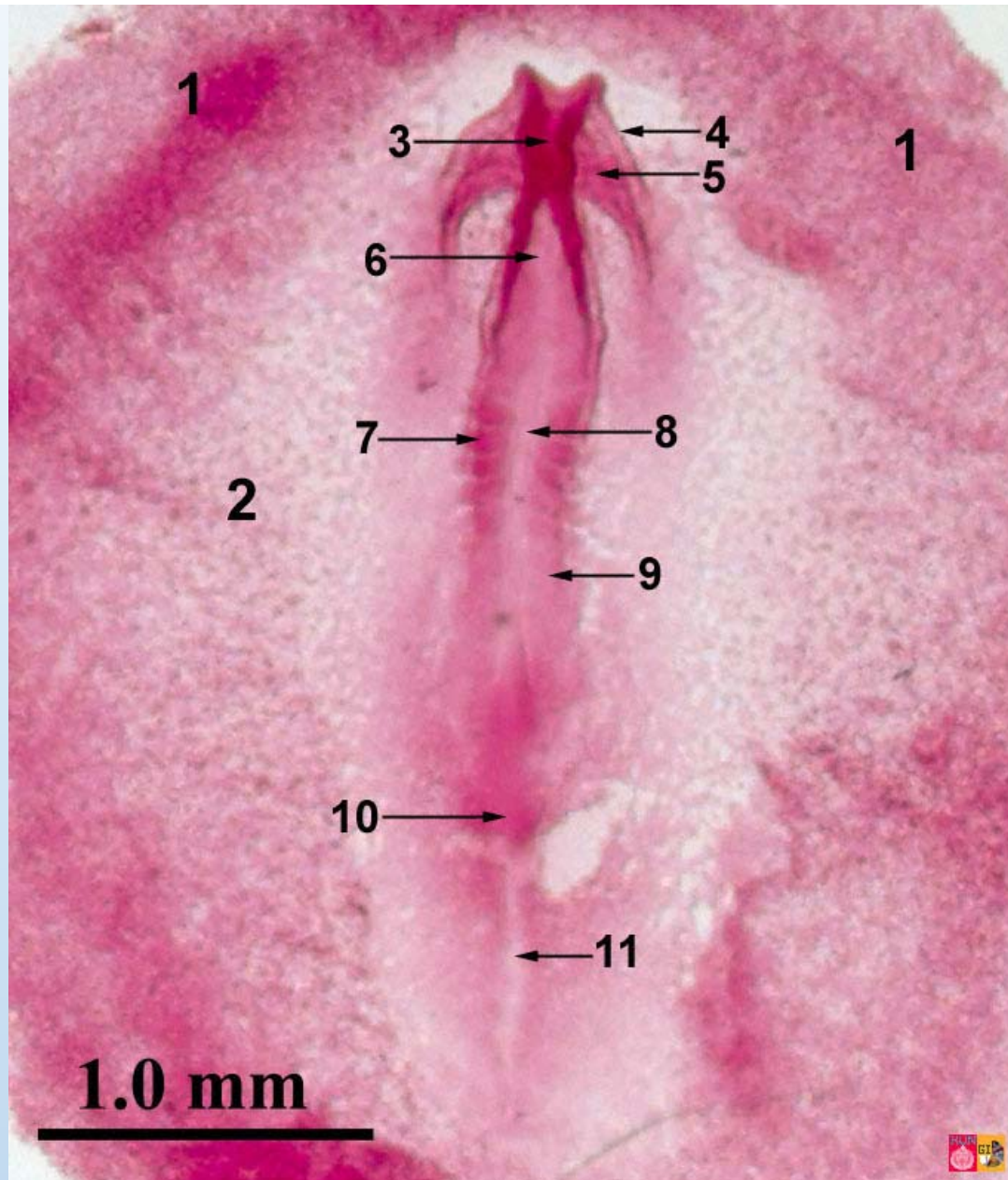


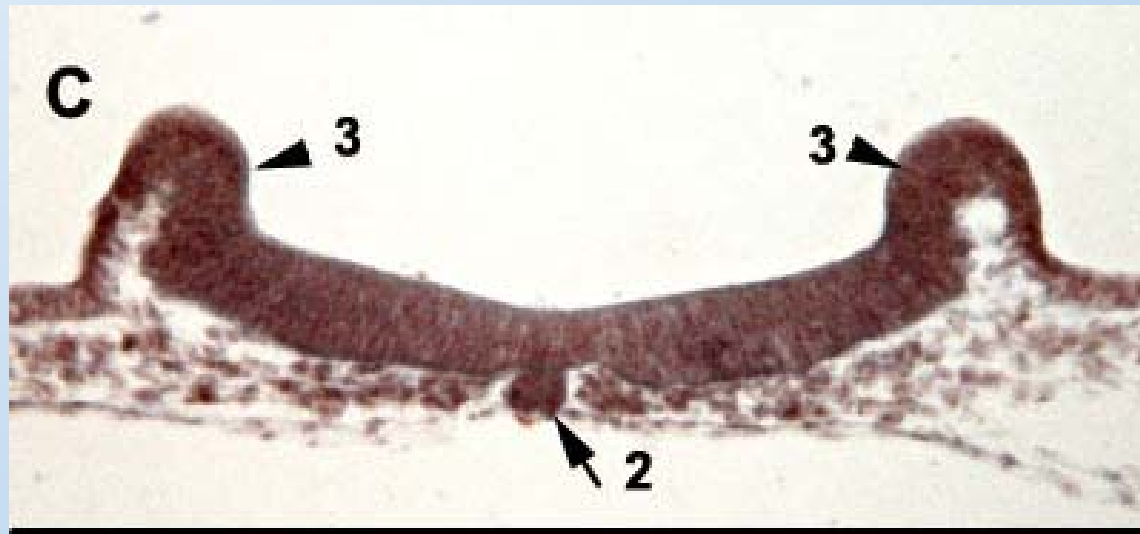
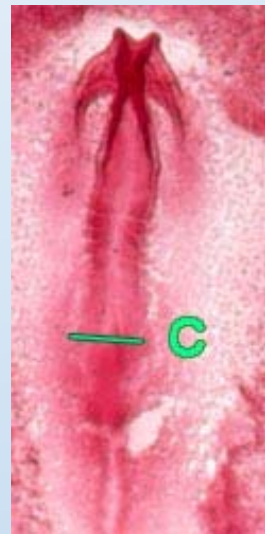
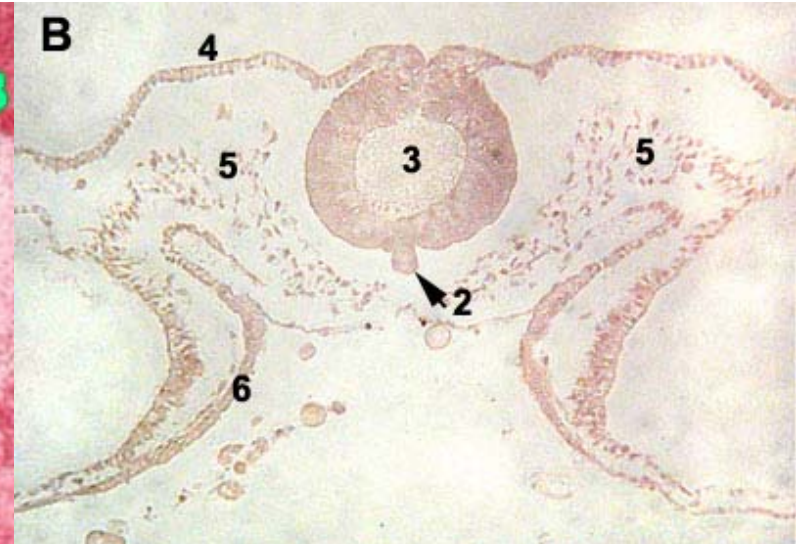
18-20 h

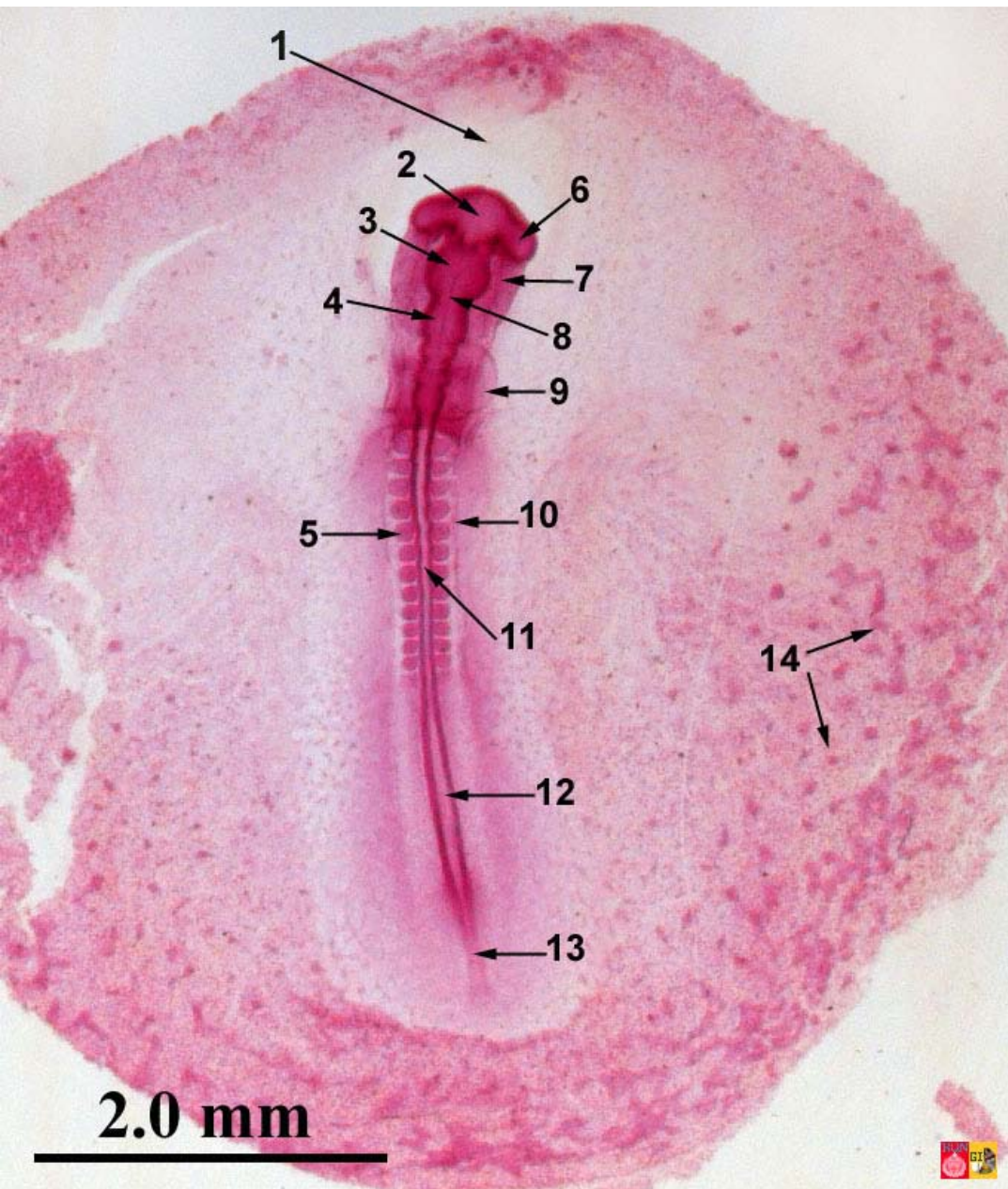




24 h

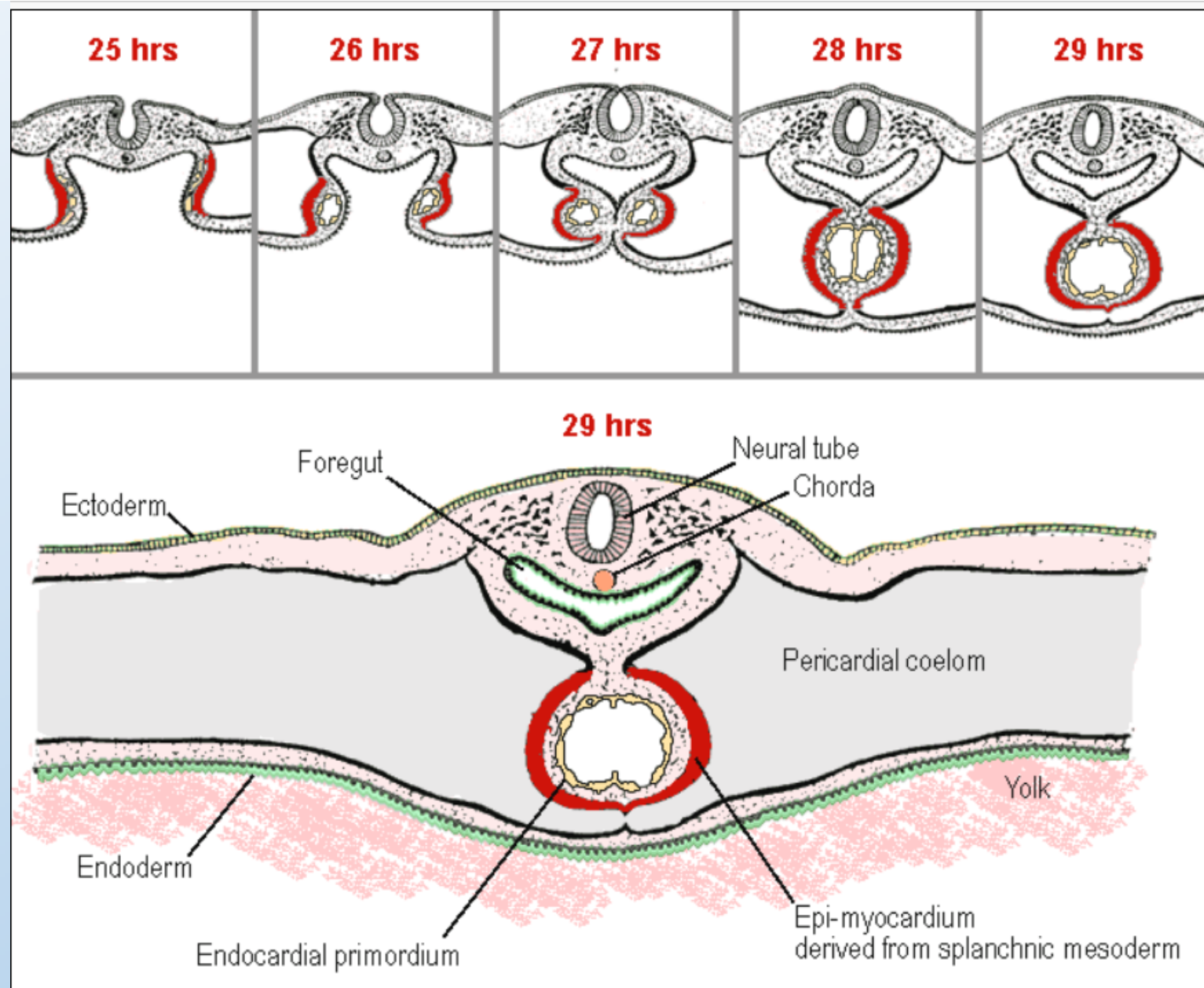


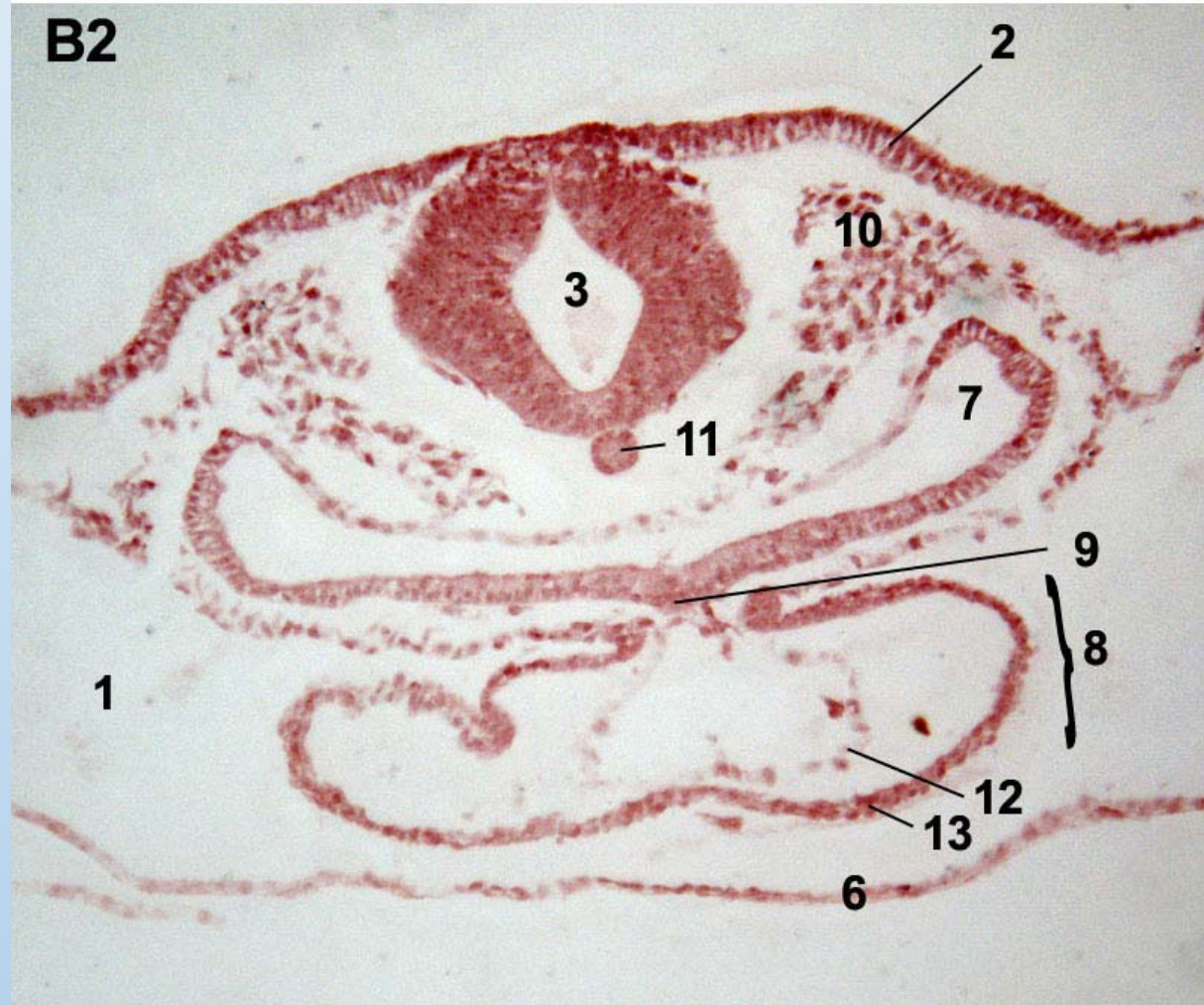
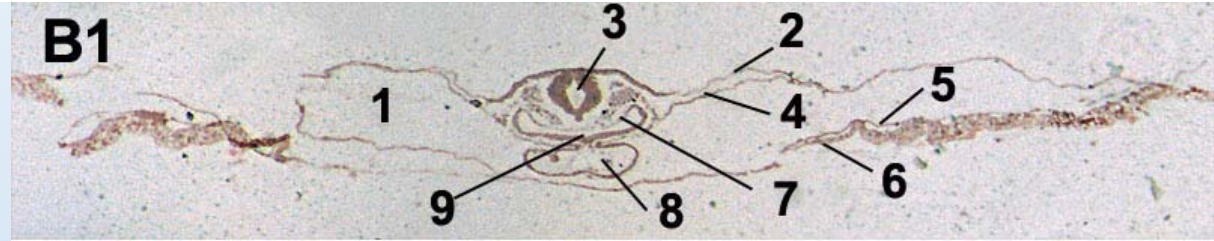
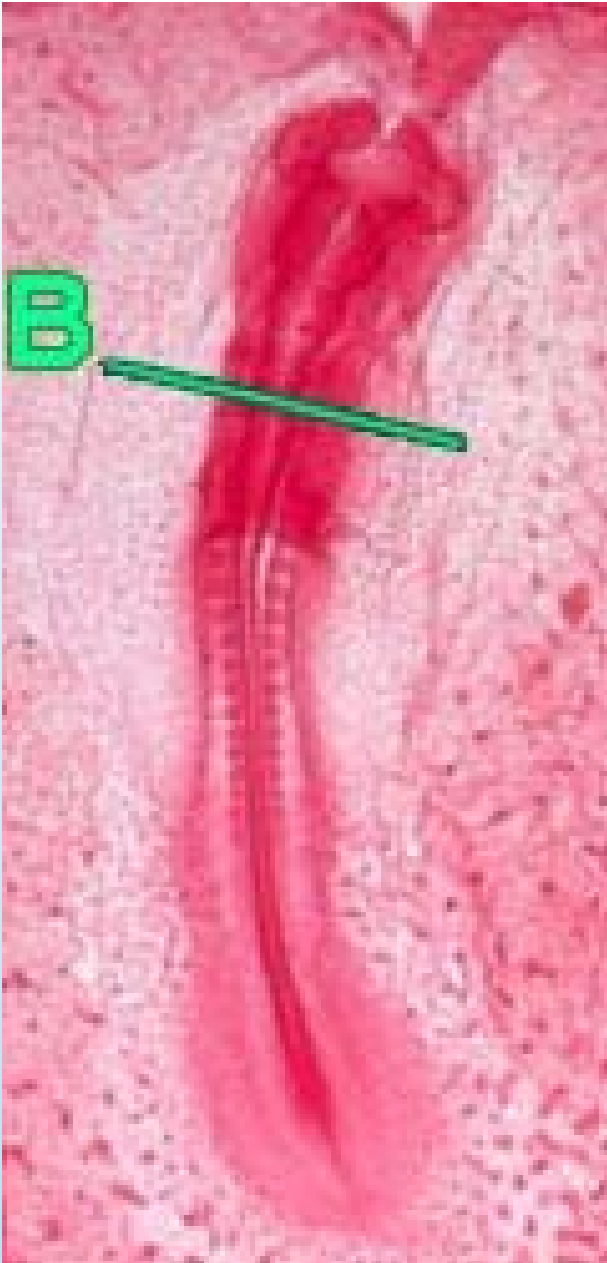




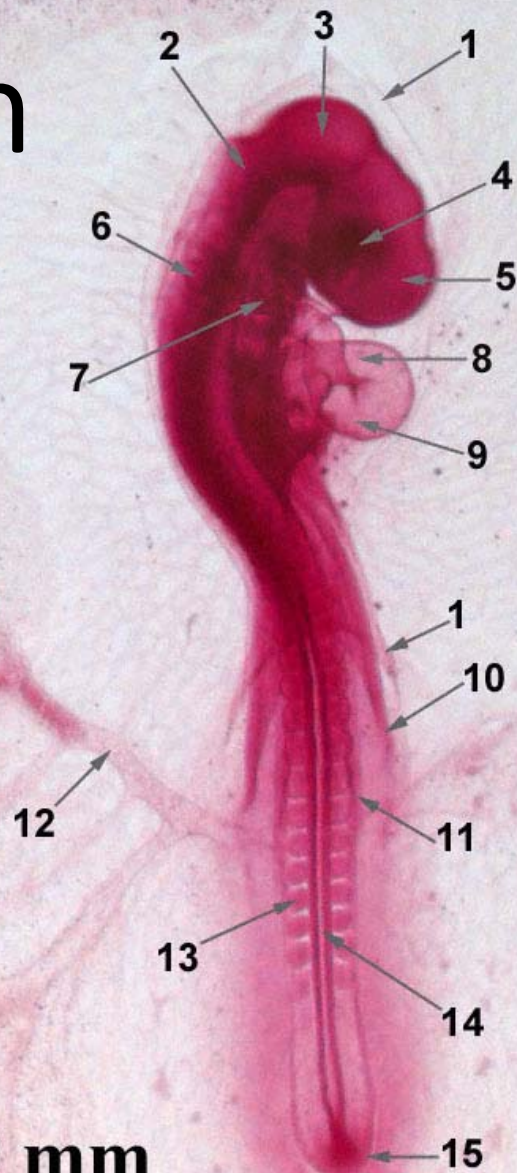
33h

心的形成



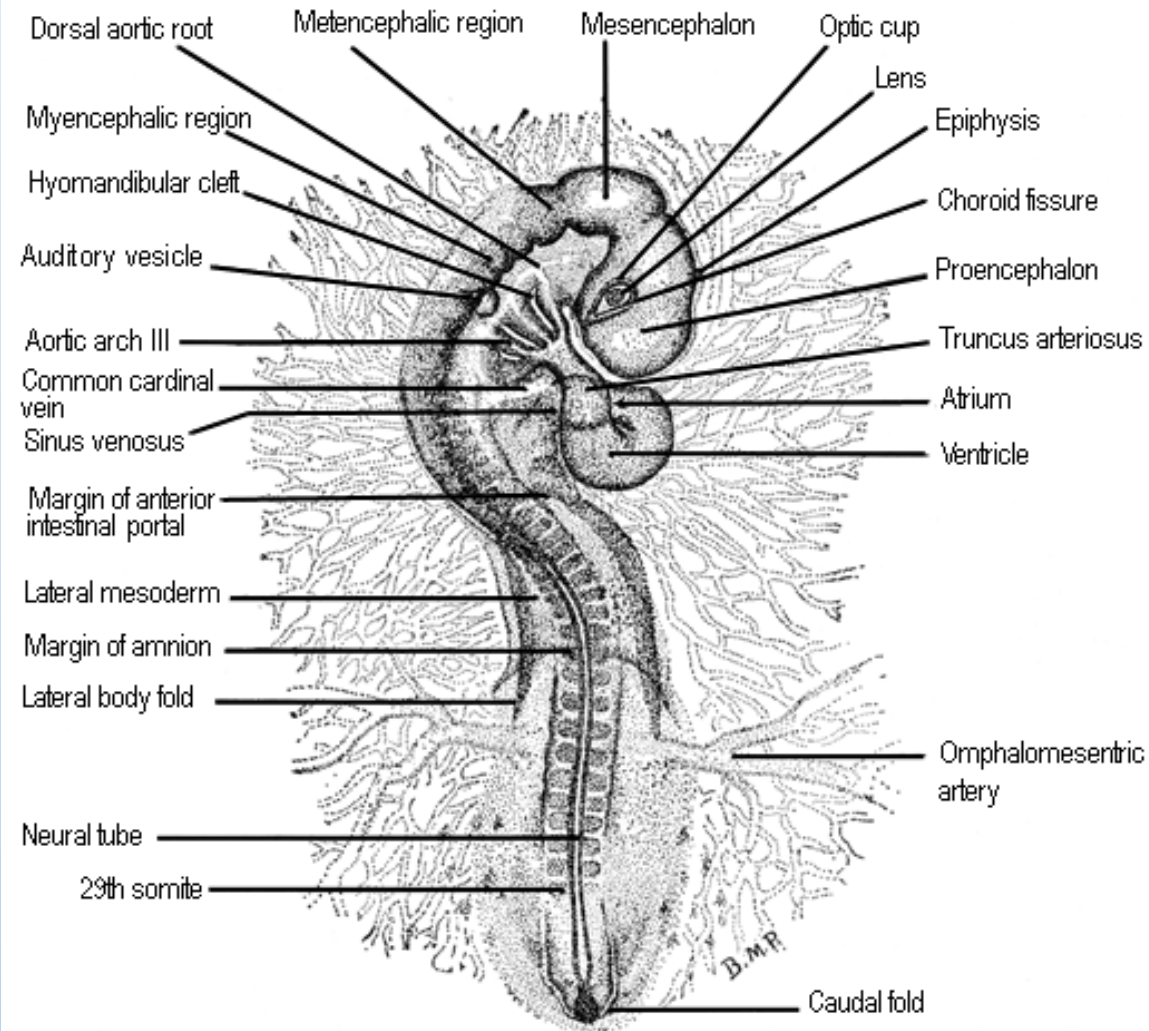


48h

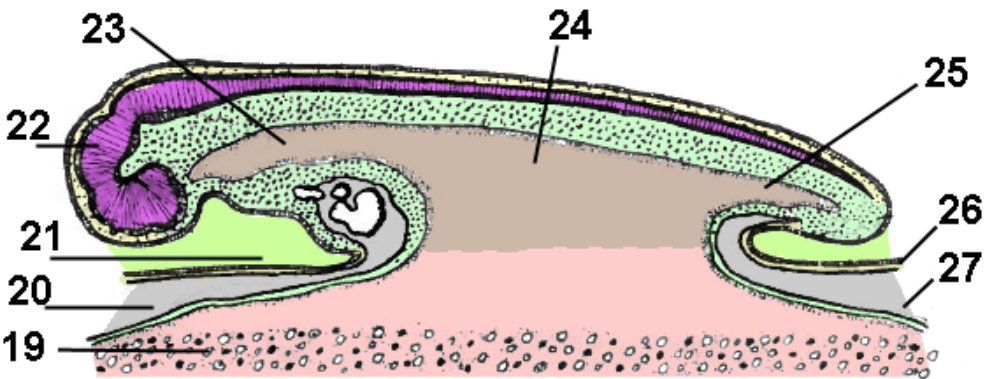


2.0 mm

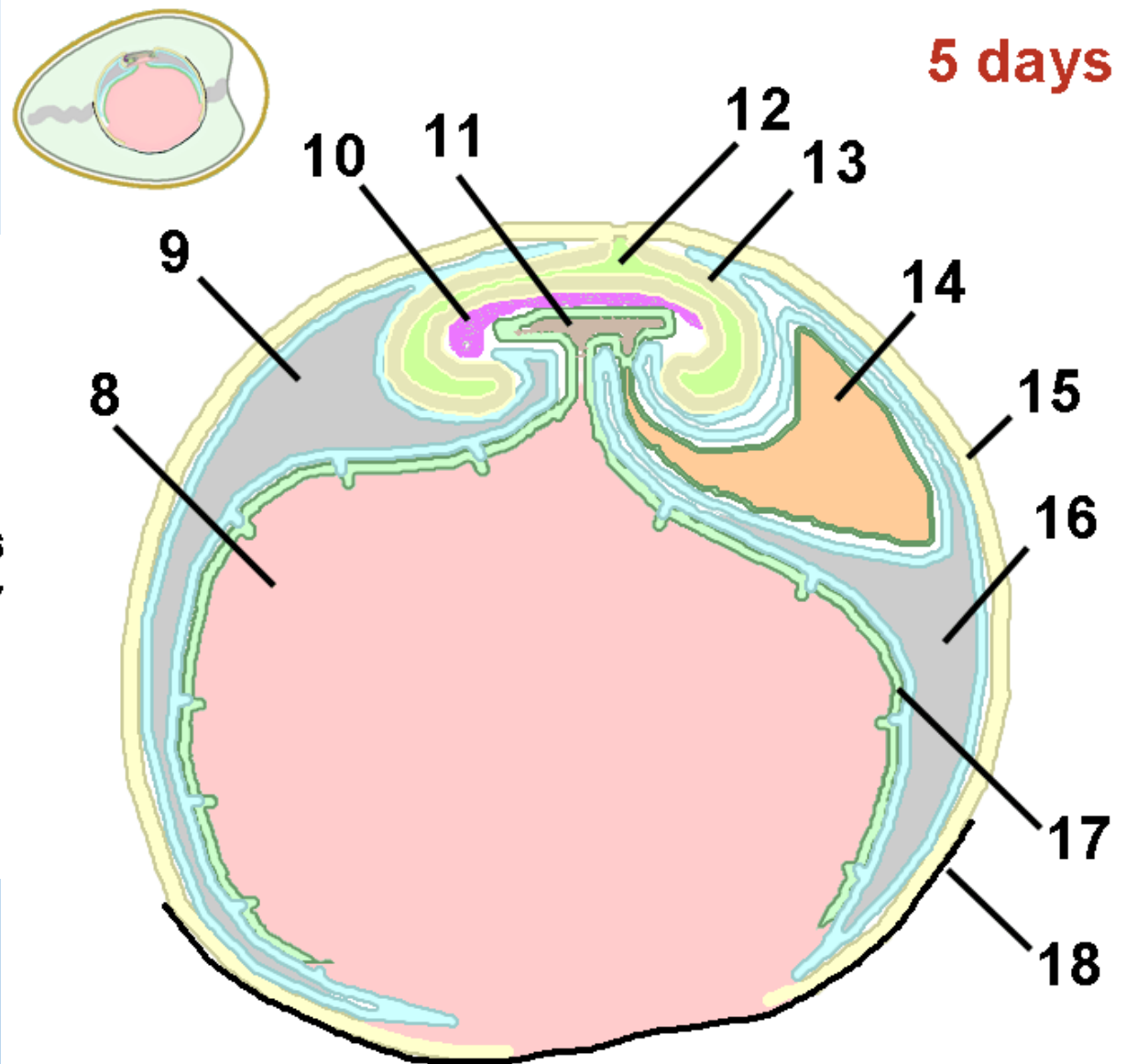
55 hrs

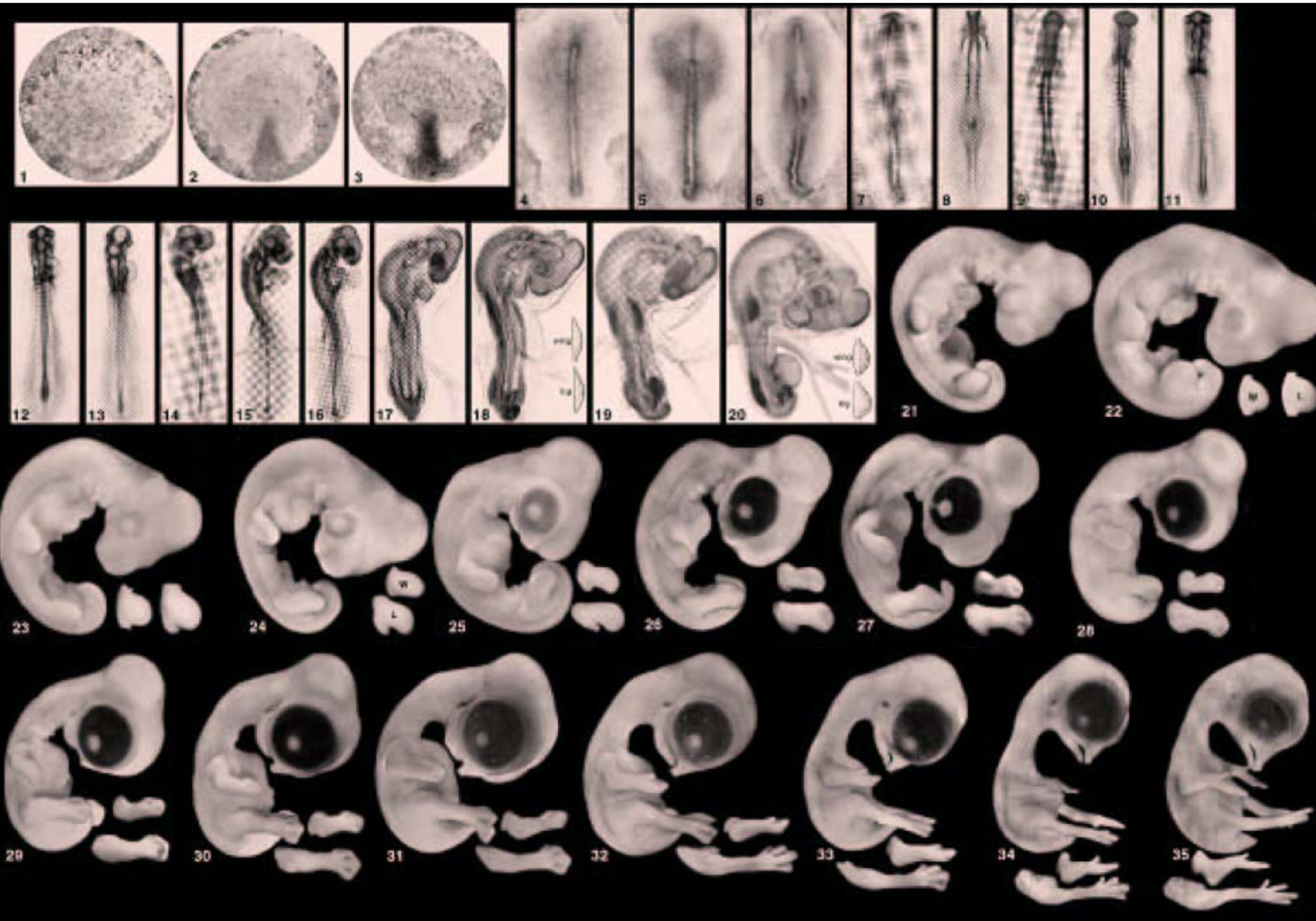


3 days



5 days





Hamburger and Hamilton described 46 distinct stages of the chicken embryo in "A series of normal stages in the development of the chick embryo". *Journal of Morphology*. 88 (1): 49–92.

实验2 小鼠解剖

规程

- 1 用镊子夹住眼球根部将其摘除，检查结膜、视网膜。
- 2 沿环枕关节横断颈部，使头颈分离，再去掉头盖骨，用镊子提起脑膜，用剪刀剪开，检查颅腔液体数量、颜色、透明度等情况。用镊子钝性剥离大脑与周围的连结，然后将大脑从颅腔内取出。
- 3 取出垂体，检查有无肿大、充血。
- 4 动物取背卧位，使其四肢摊开，剥去下颌部和颈部皮肤，取出淋巴结和唾液腺。
- 5 沿腹部正中线切开剑突至肛门之间的腹前壁，再沿最低位肋骨分别向左右两侧切开侧腹壁至脊柱两旁，完全暴露腹腔器官。观察有无积液、血液和炎性渗出物。
- 6 用镊子夹住胸骨剑状突，剪断横膈膜与胸骨的连接，然后提起胸骨，在靠近胸椎基部，剪断左右胸壁的肋骨，将整个胸壁取下。
- 7 分离出淡黄色的一对胸腺。
- 8 分离出心脏。
- 9 用镊子夹住气管向上提起，剪断心脏与胸膜的连结韧带，将肺脏取出。
- 10 将下颌骨的两下颌支内侧与舌连结的肌肉剪断，将咽、喉、气管、食道与周围组织分离一并取出。
- 11 在腹腔左侧可见到红色的脾脏，一手用镊子将脾脏提起，一手持剪刀剪断韧带，采出脾脏。

12 胰脏靠近胃大弯和十二指肠，可将胰脏连同周围的脂肪组织一同取出。

13 用镊子提起胃贲门部，切断靠近贲门的食道，一边牵拉，一边切断周围韧带，使胃同周围组织分离，然后按着十二指肠、空肠、回肠、盲肠、结肠、直肠的顺序，切断这些肠管的肠系膜根部，将胃肠从腹腔内采出，动作要轻，以免拉断肠管。

14 一手提起动物让其直立，使肝脏自然下垂，切断肝脏周围的血管和韧带，使其自然滑落。

15 用镊子剥离肾上腺周围的脂肪，将肾上腺取出。

16 用镊子剥离肾脏周围的脂肪，将肾脏采出。

17 采出膀胱和生殖器。骨盆腔脏器采出先切离直肠与盆腔上壁的结缔组织，雌性动物还要切离子宫与卵巢，再由骨盆腔下壁切离膀胱颈、阴道及生殖腺，最后将肛门、阴门作圆形切离，即可取出骨盆腔脏器。