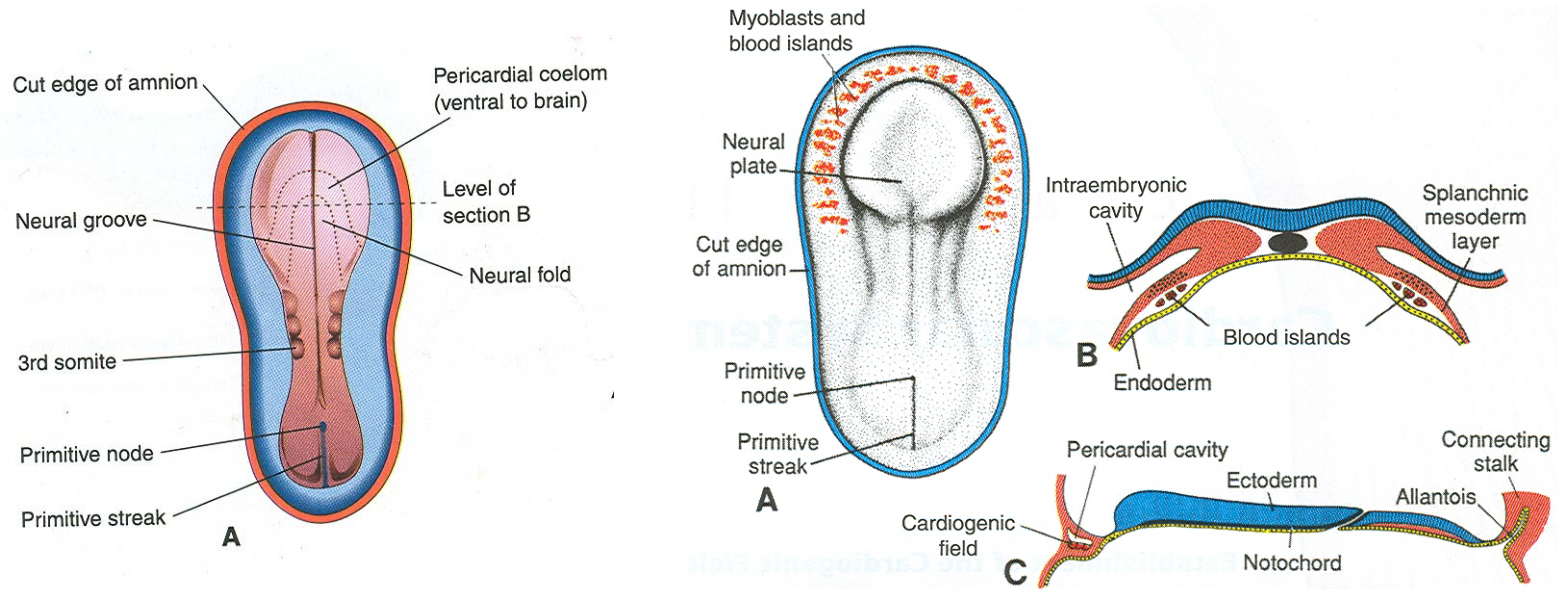


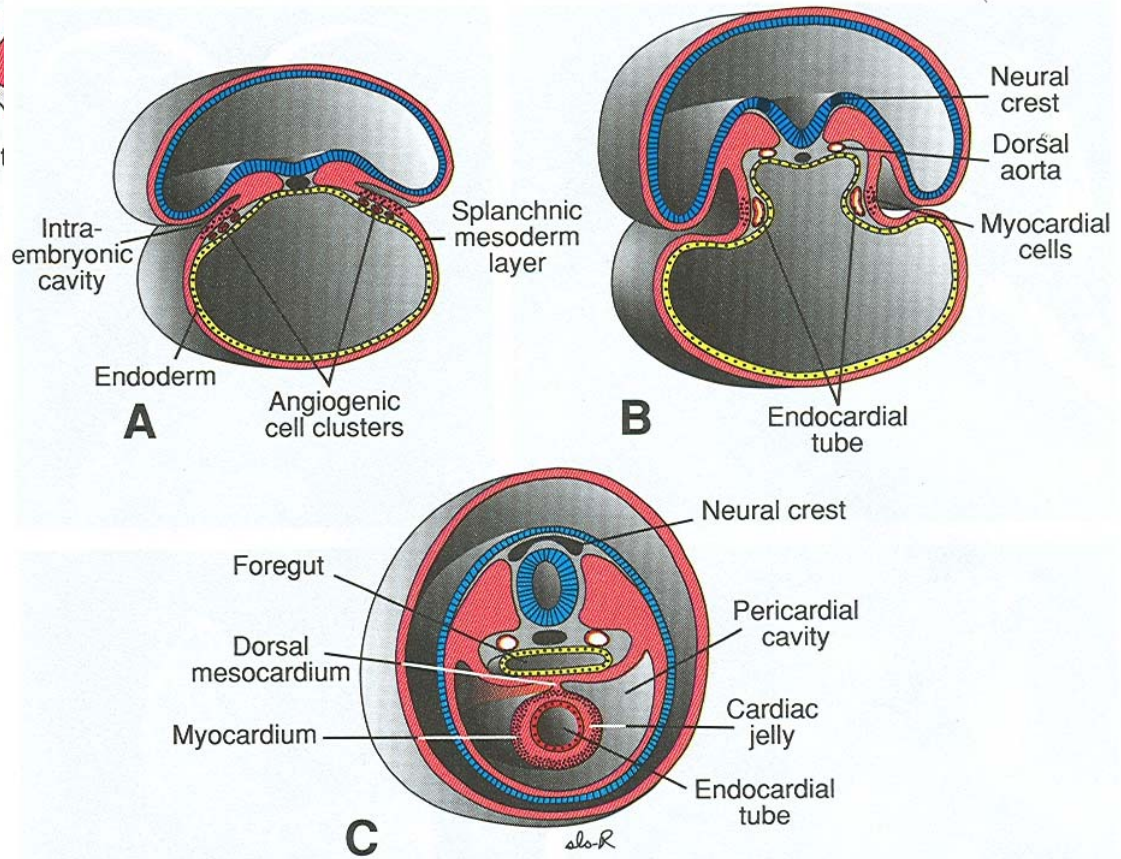
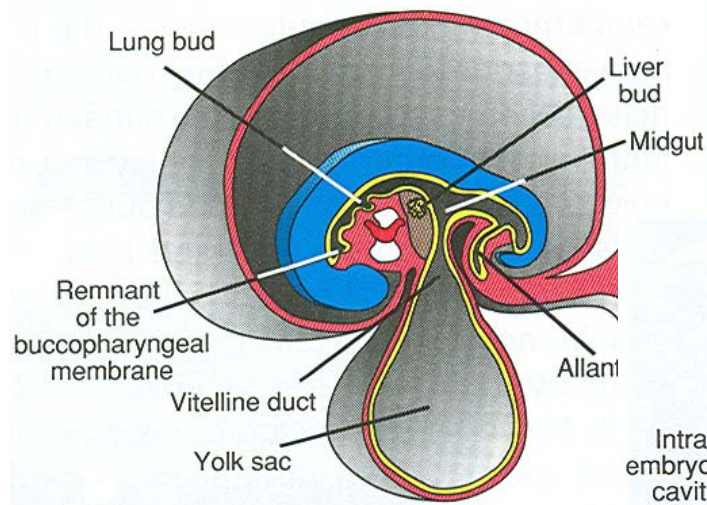
Cardio-vascular system



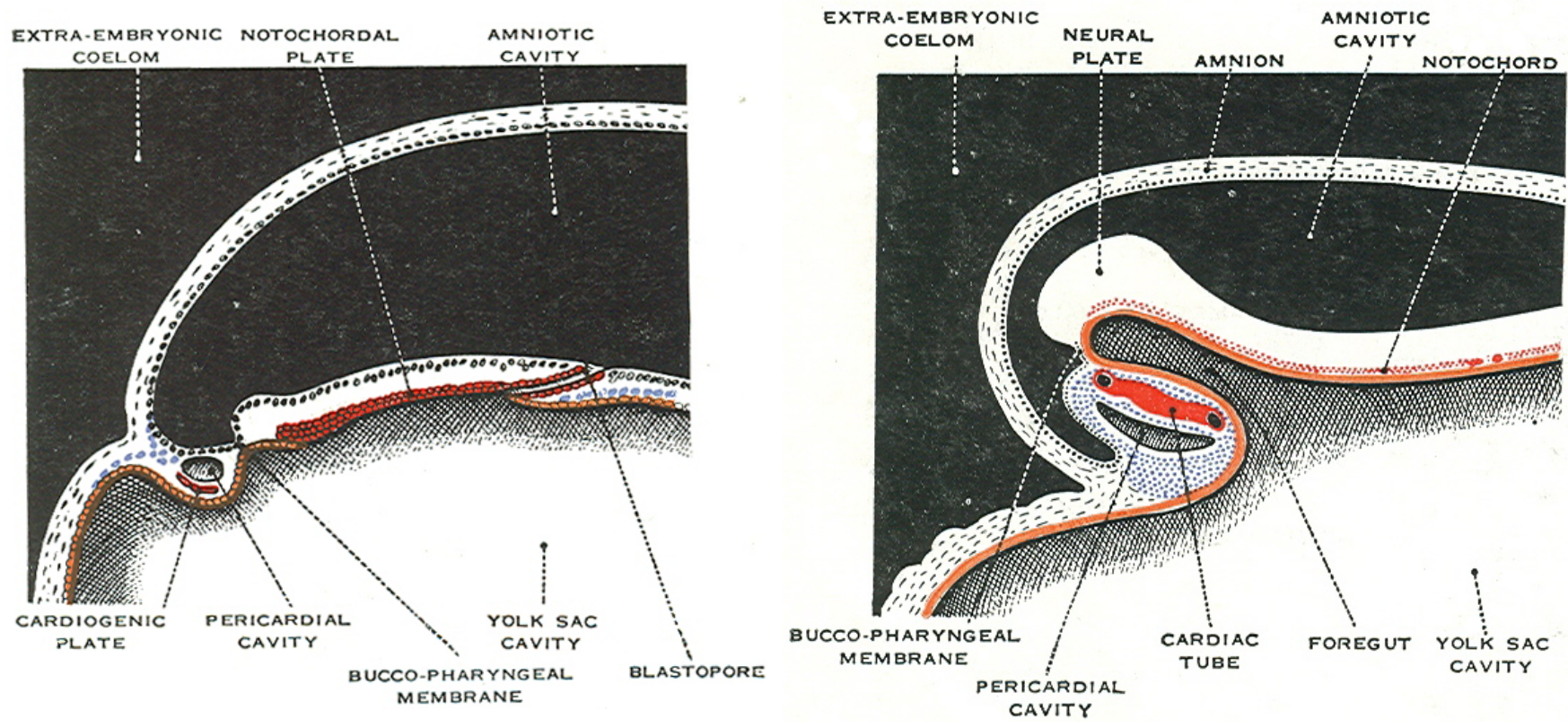
Angiogenesis

Vasculogenesis

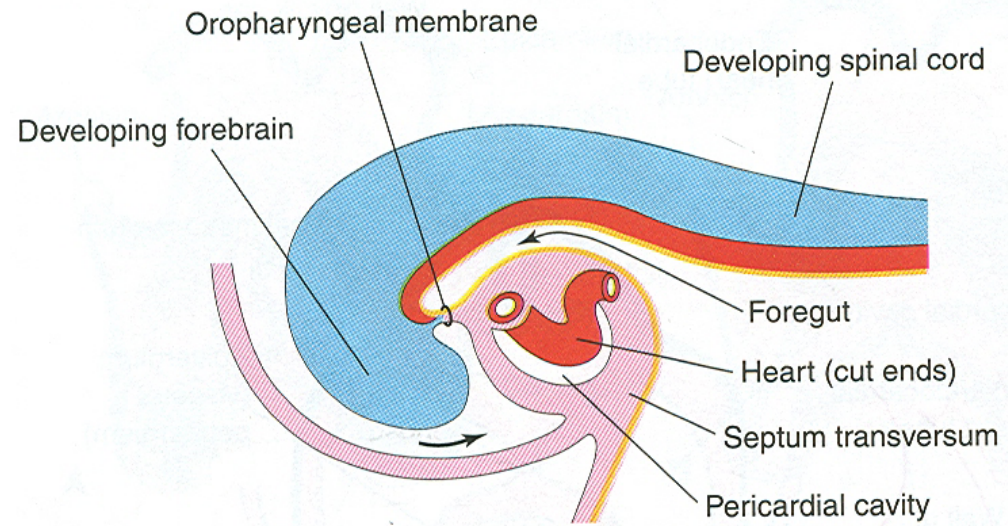
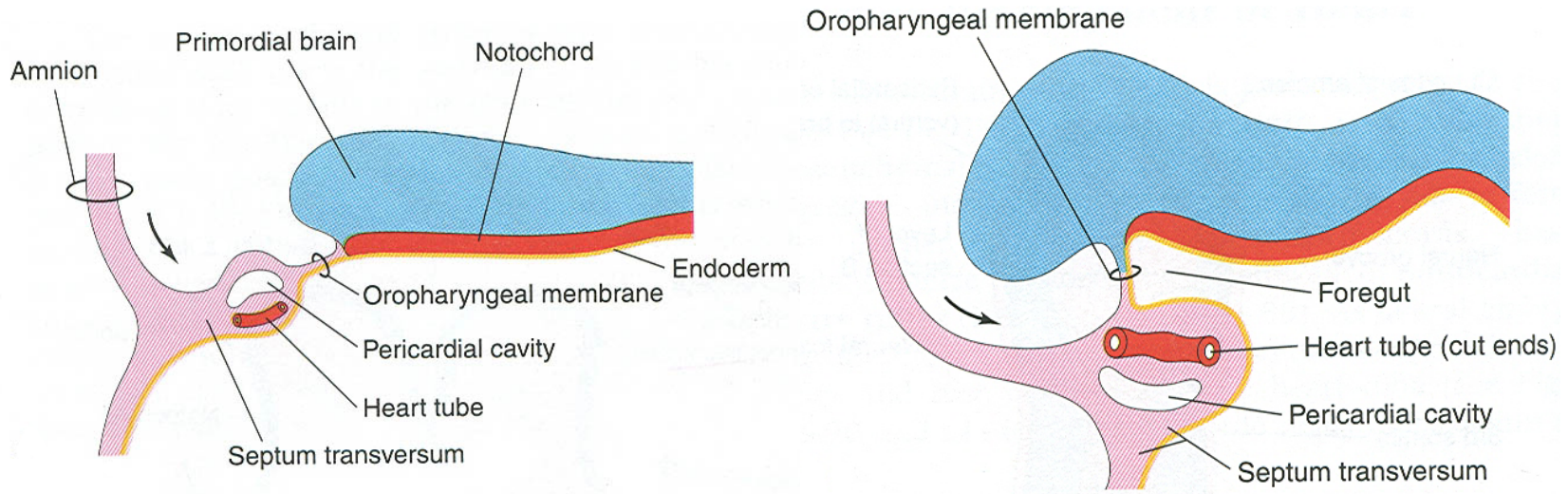
Cardiogenic area

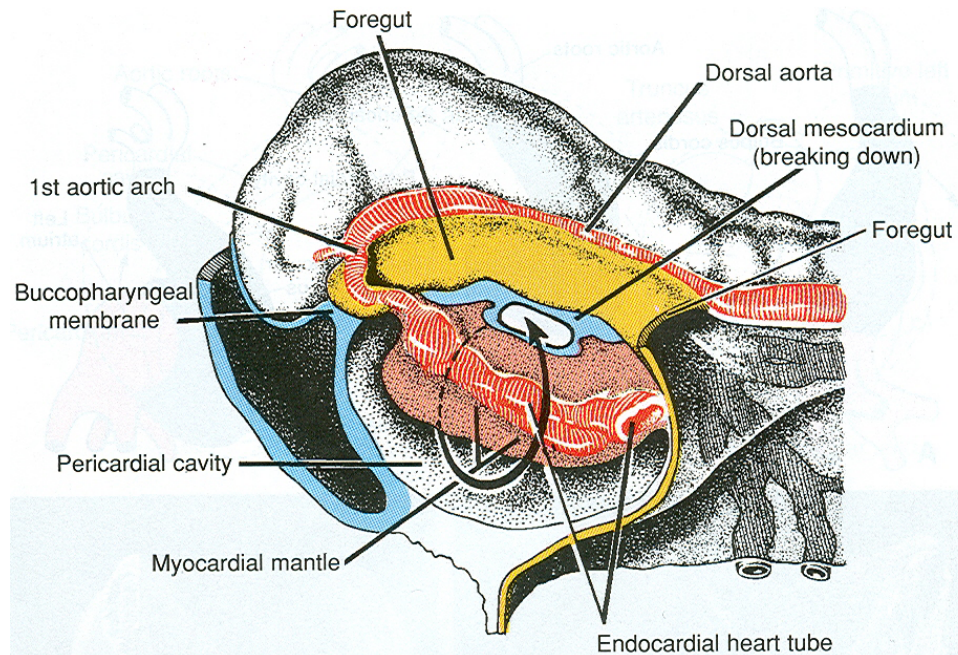
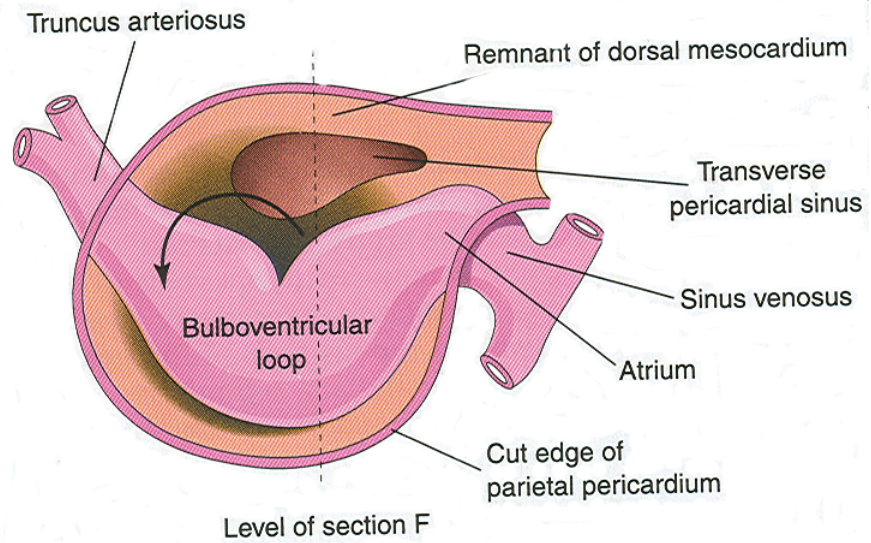
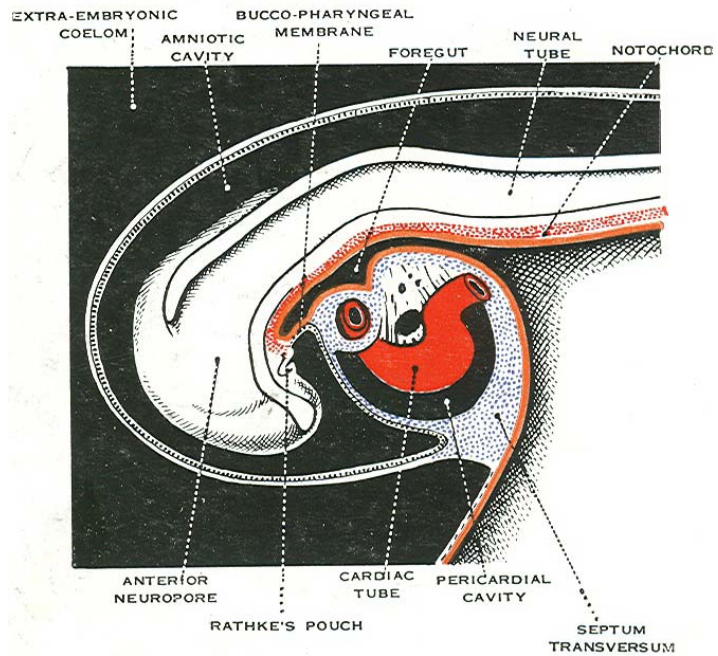


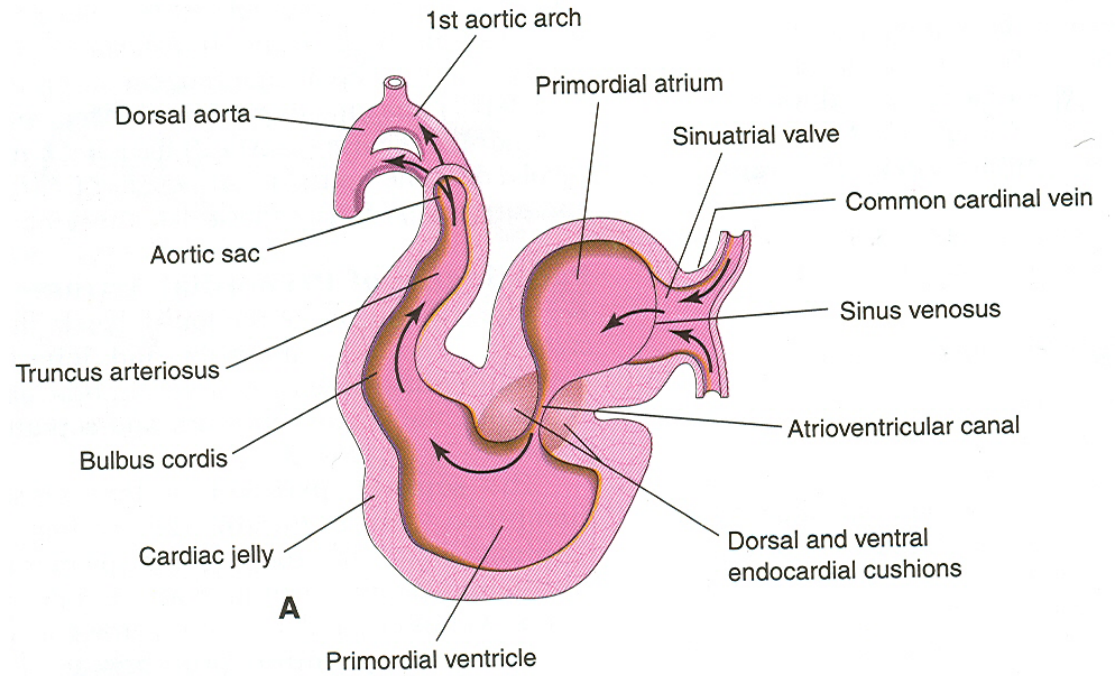
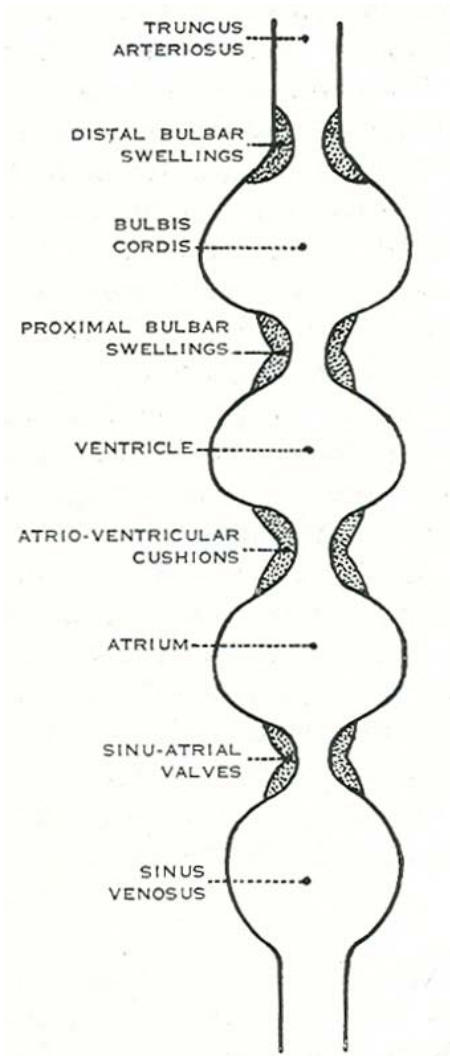
Formation of heart tube
 Myo-epicardial mantle
 Cardiac jelly



Both heart tube and pericardial cavity develop from lateral plate mesoderm



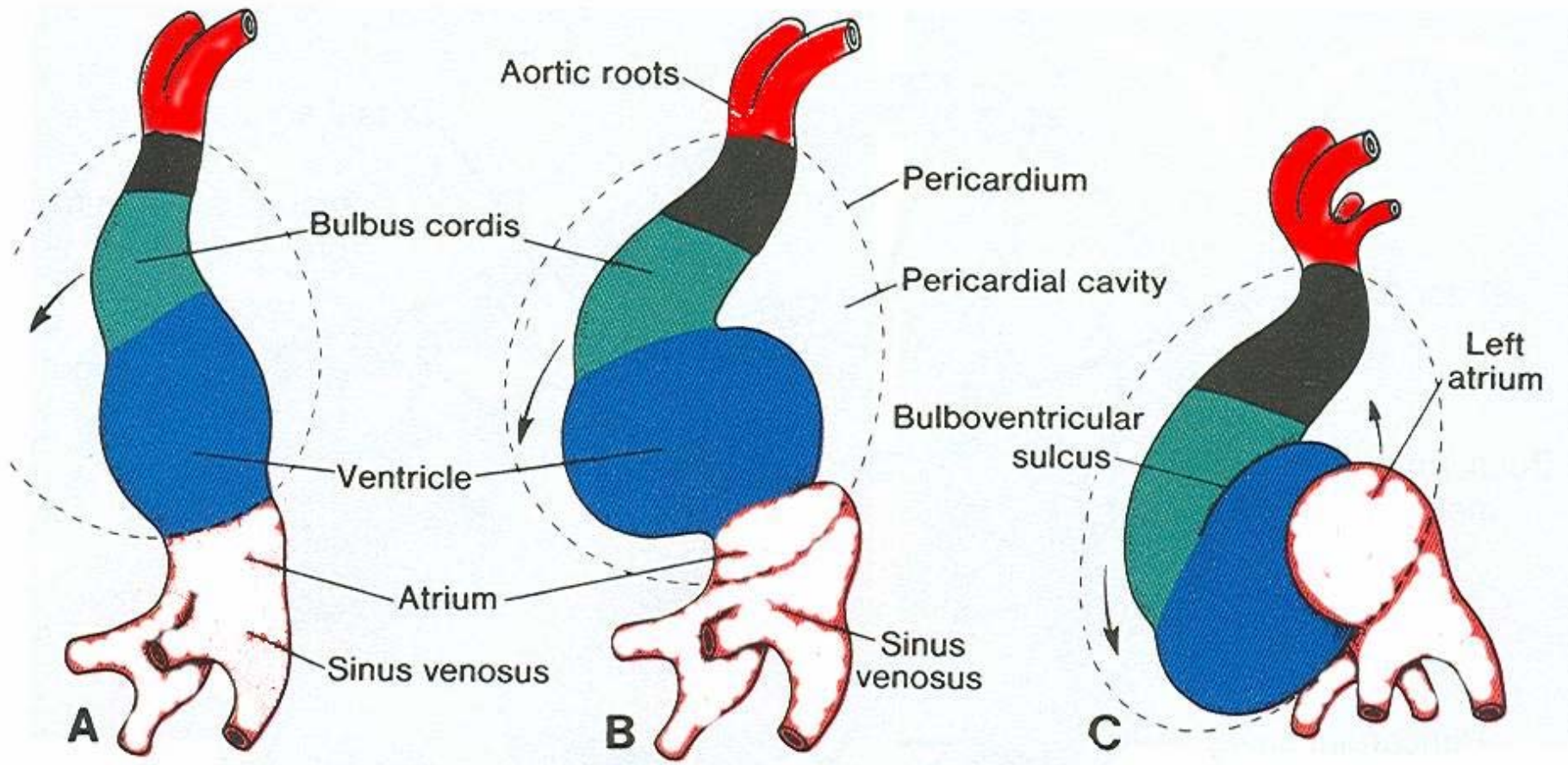


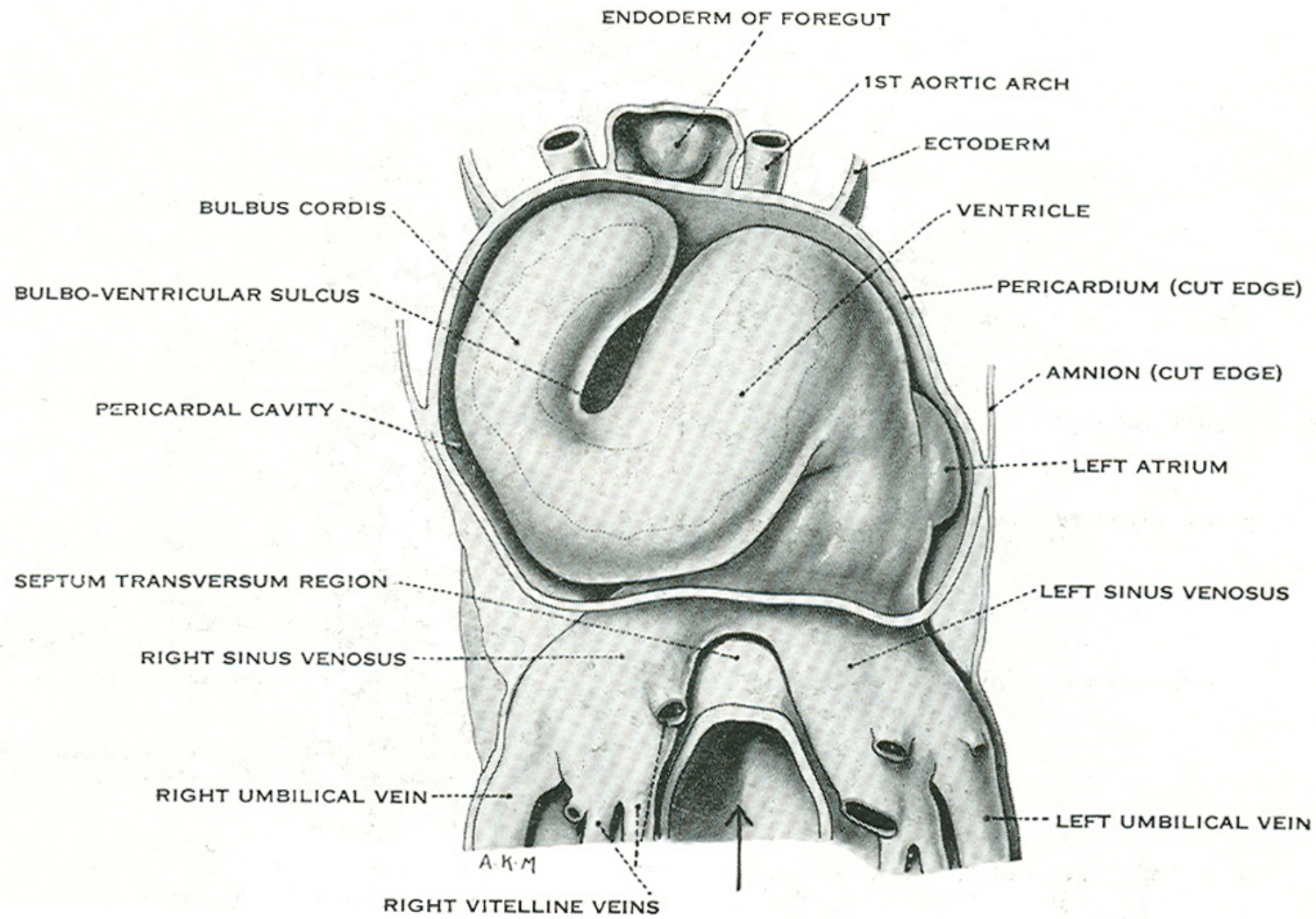


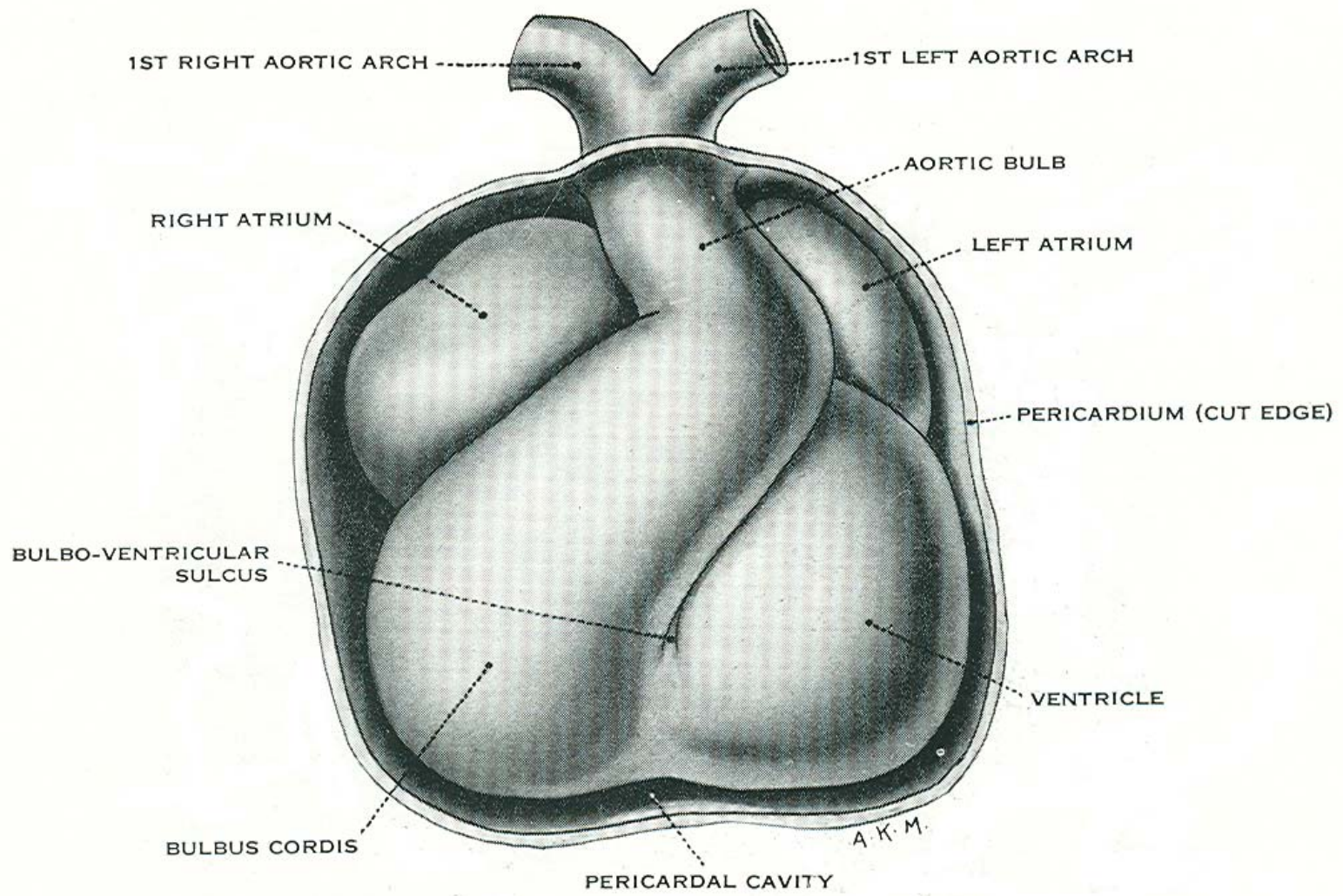
Primitive heart tube

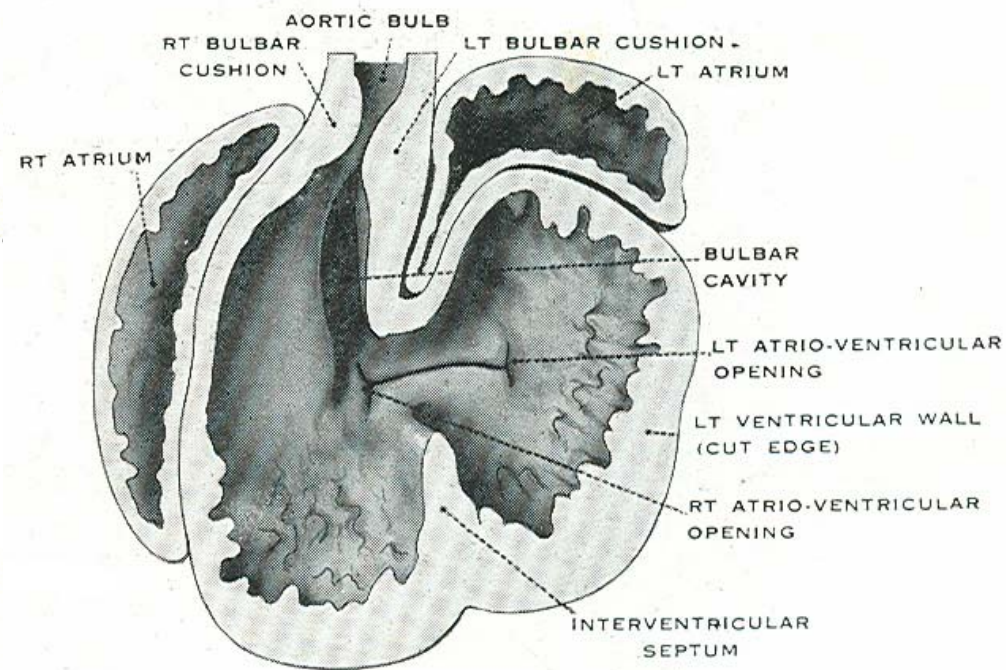
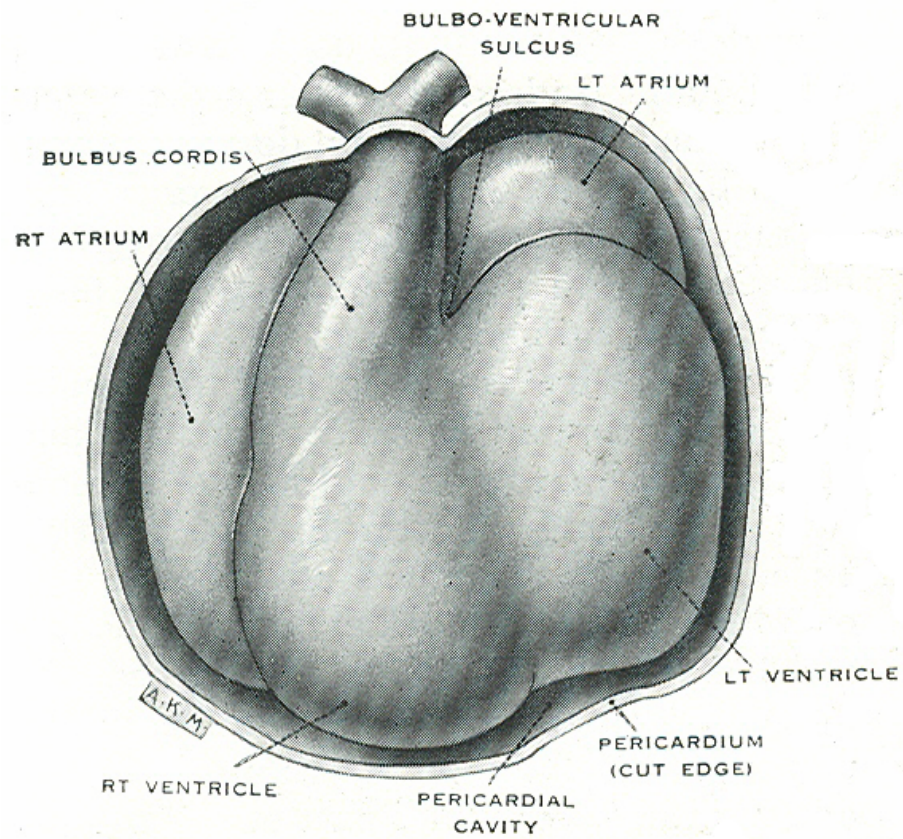
Occupies pericardial cavity

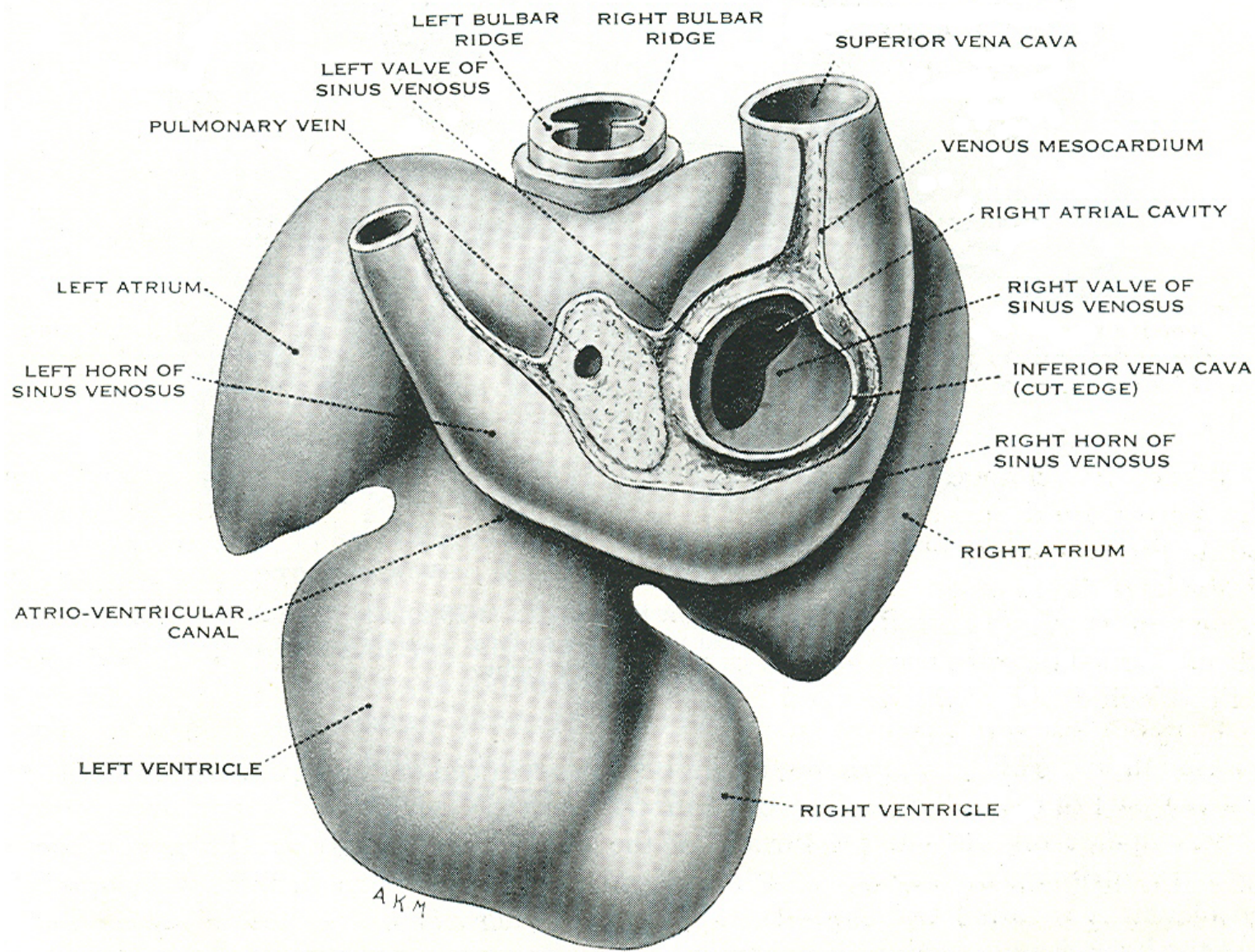
Loop formation











Chambers of primitive heart

- Sinus venosus: central part & two horns

Each horn receives-

common cardinal Vs

vitelline Vs

Umbilical Vs

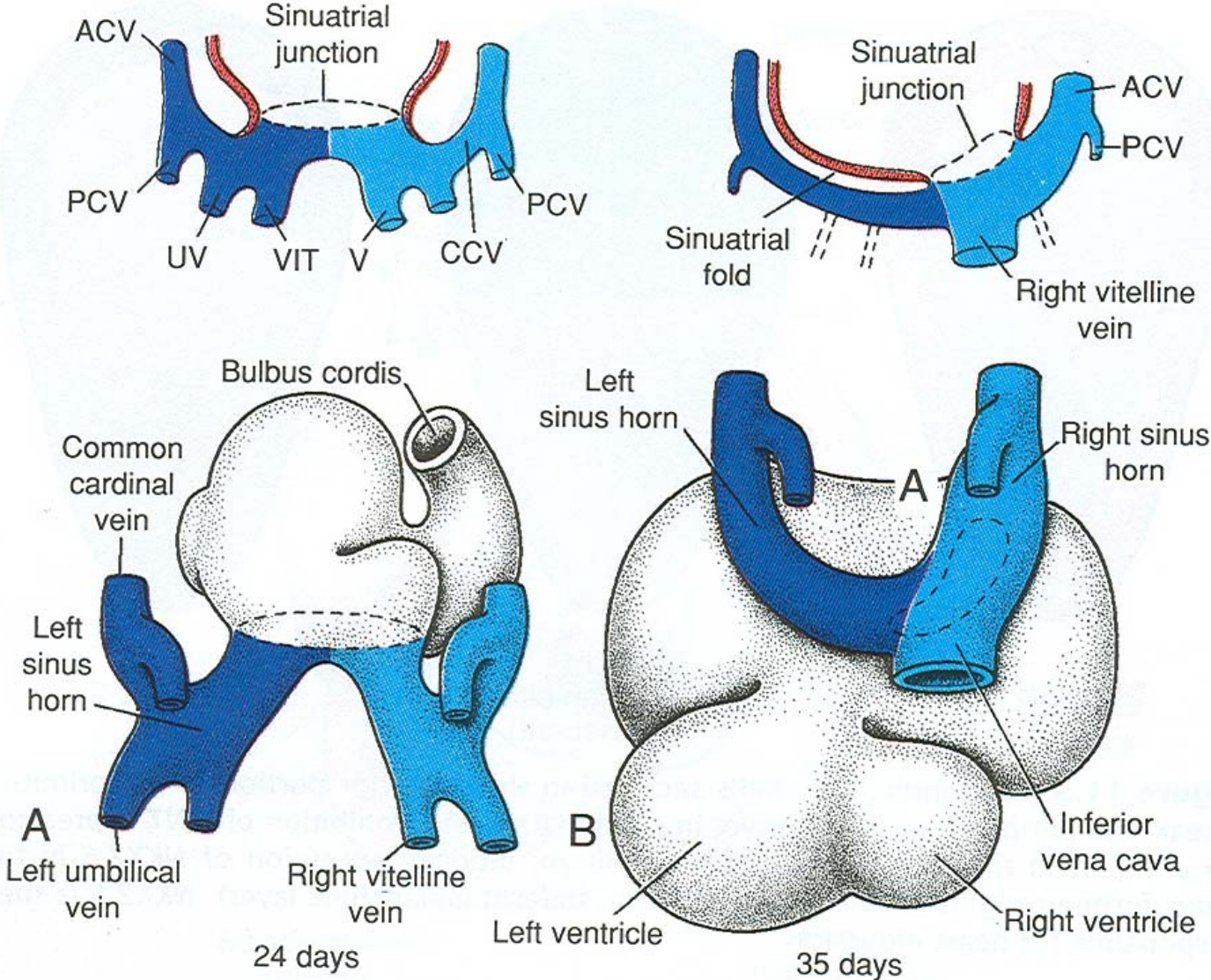
- Common atrial chamber
- Common ventricular chamber
- Bulbous cordis: Three parts

Proximal

Middle conus cordis

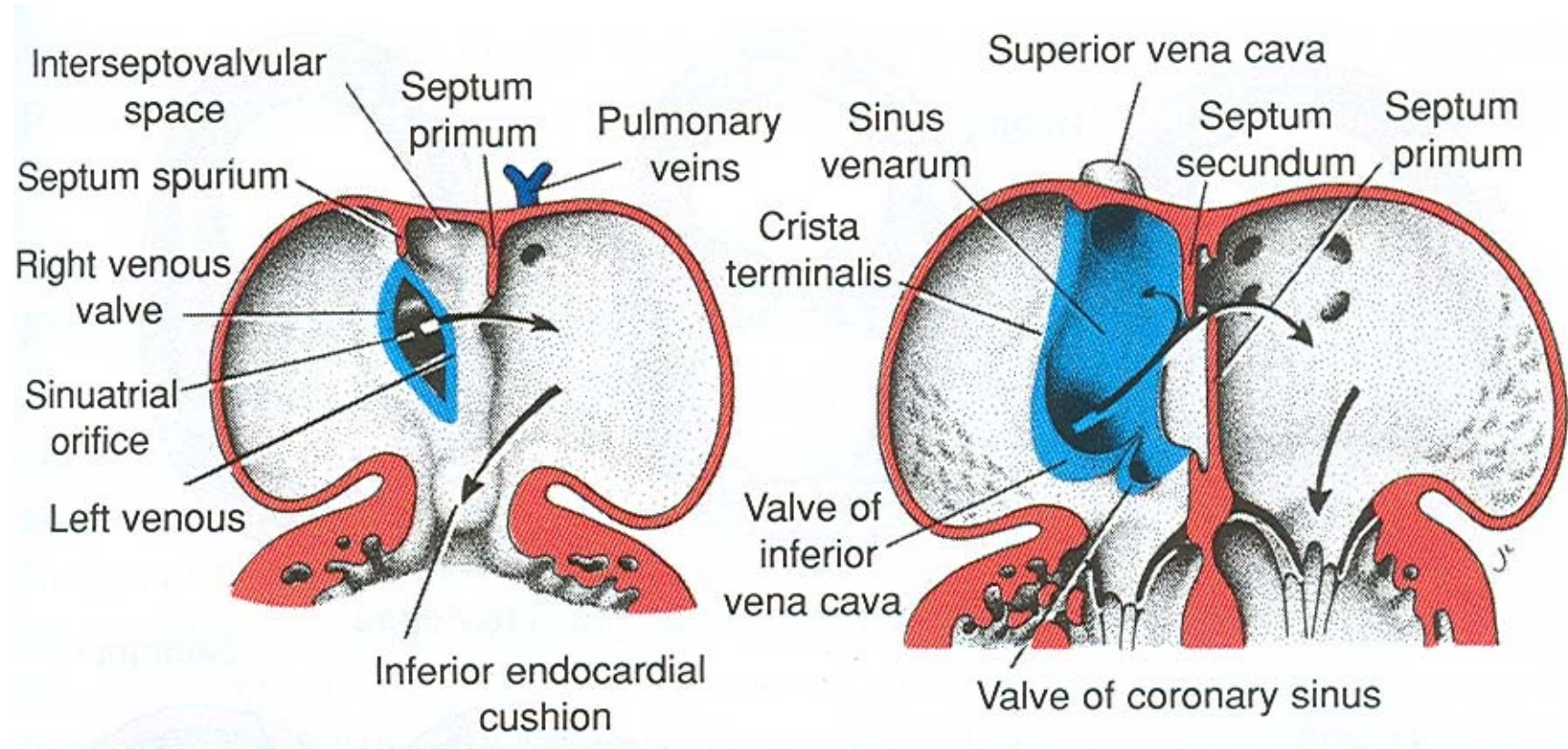
Distal truncus arteriosus

Fate of sinus venosus

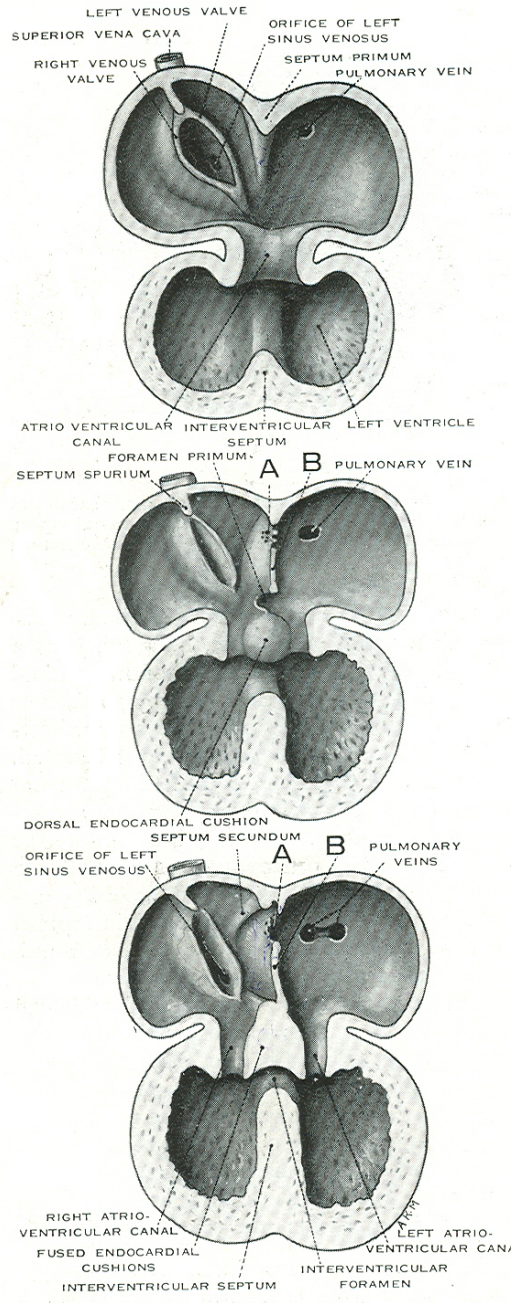


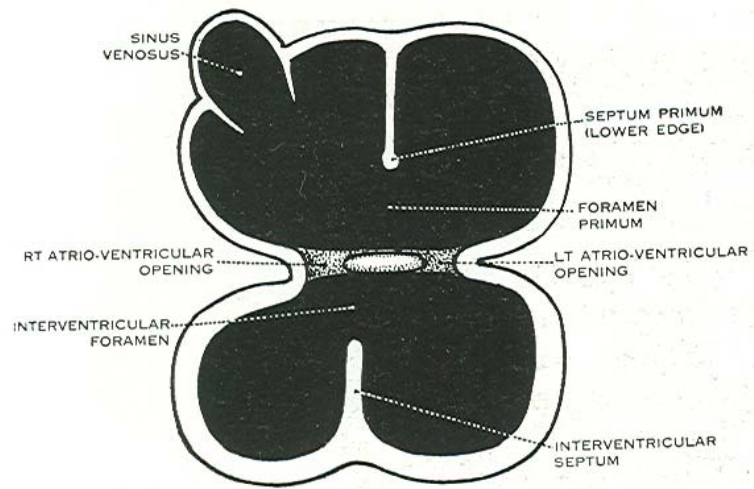
Fate of sinus venosus

- Left to right shunt of venous blood
- Opening of sinus venosus is guarded by right & left *sinuatrial valves*
- Left valve forms *septum spurium*
- Right valve elongates, extends downwards and gets divided by the appearance of two sub-endocardial limbic bands
 - Crista terminalis
 - Valve of Inferior vena cava (Eustachian valve)
 - Valve of coronary sinus (Thebsian valve)
- Sinus venous gets absorbed into right atrium to form smooth part- *sinus venarum*

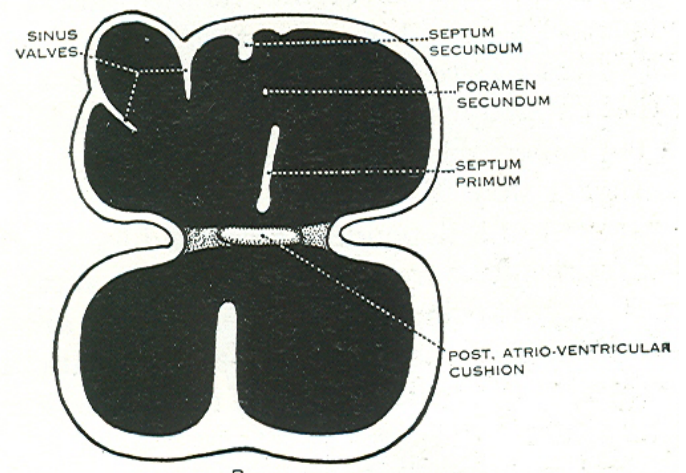


Formation of inter atrial septum

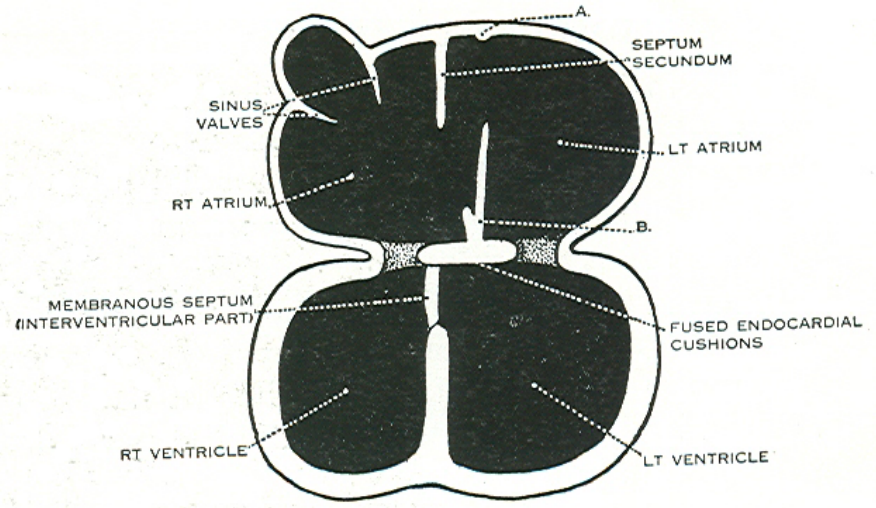




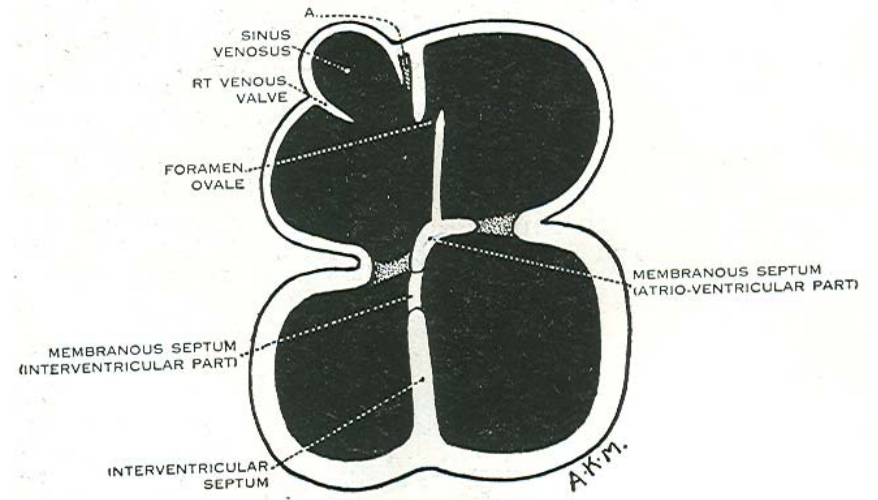
A.



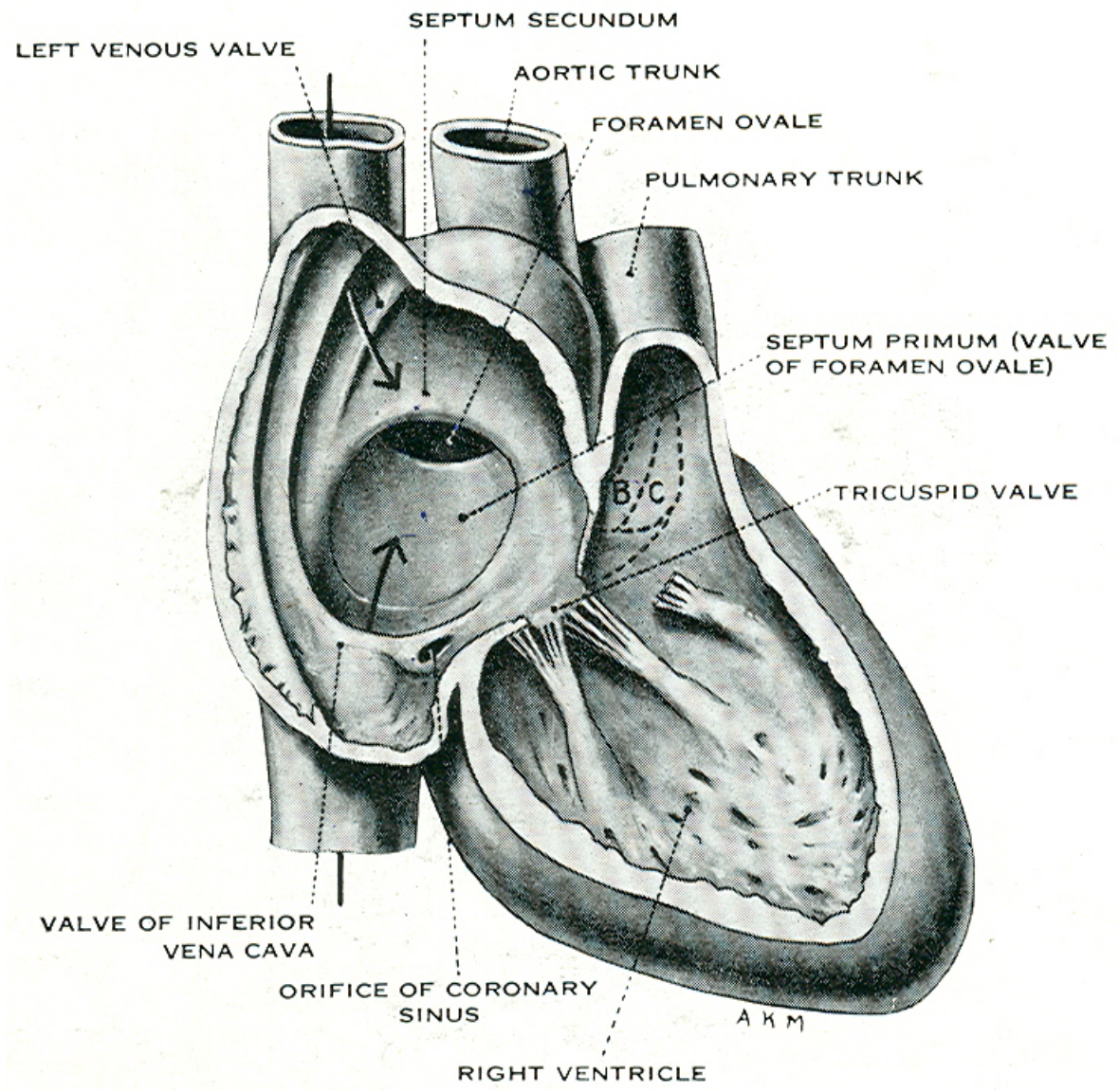
B.




C.

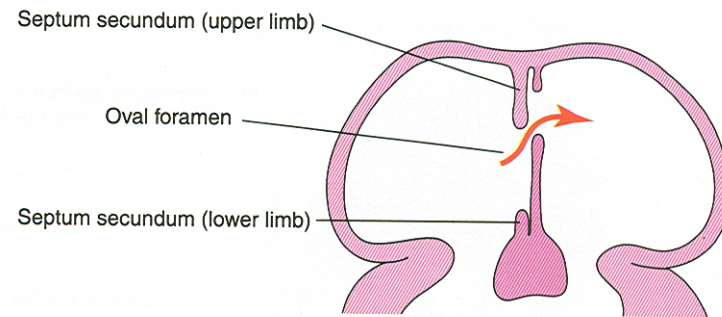
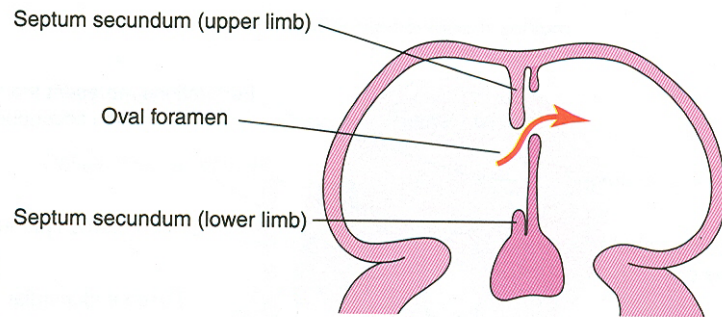
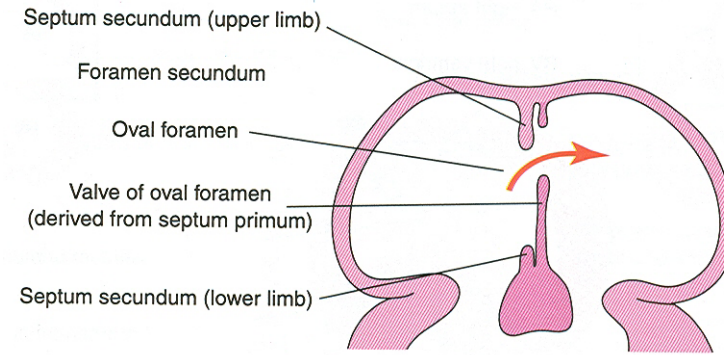
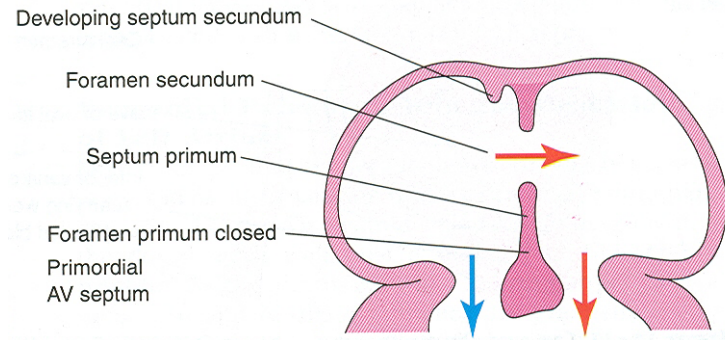


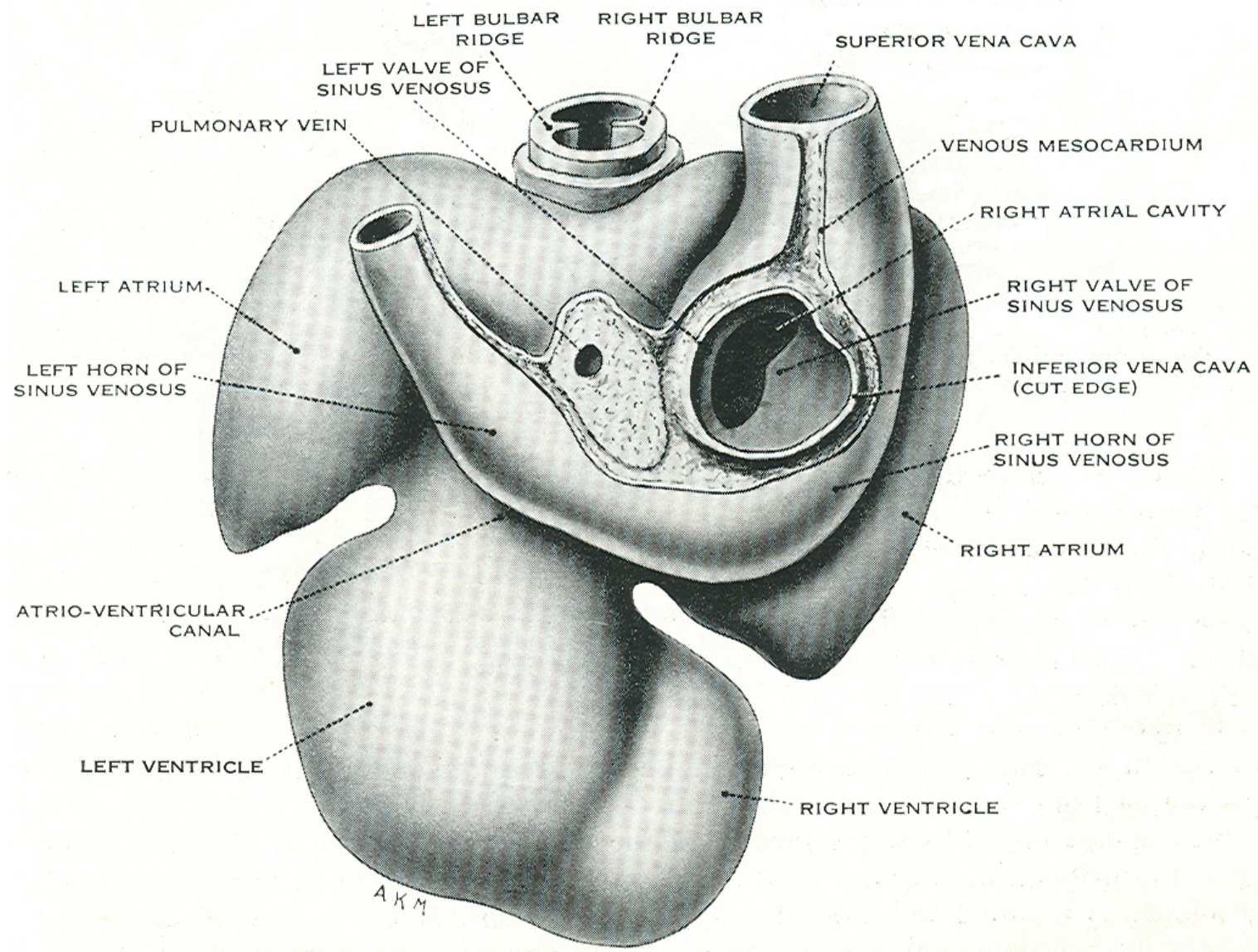
D.



Formation of Interatrial Septum

- Appearance of *septum primum*.
- Appearance of atrio-ventricular endocardial cushions
 These cushions divide the AV canal into right and left.
- Fusion of S. primum with endo-cardial cushion
- Breakage of upper part of S. Primum
- Appearance of *S. Secundum*
- Formation of *Foramen ovale* in between septum primum & secundum
- Valve of IVC directs blood towards left atrium through foramen ovale
- After Birth:
 - Pressure  in left atrium
 - Closure of foramen ovale
 - Formation of *Fossa ovalis*
 - Annulus ovalis* formed by septum secundum





Pulmonary Veins

- To begin- only one vein opening in to left atrium
- First divides in to two and then both further divide to form four veins.
- Proximal part of these veins gets incorporated in to left atrium.
- Therefore four openings in left atrium.

Formation of heart tube:	3 rd week
Heart beat:	22 nd – 23 rd day (beginning of fourth week)
USG detection of heart beat:	7 th week
Foetal ECG:	11 th week

Endocardium	from original heart tube
Myocardium & epicardium (visceral pericardium)	from surrounding mesoderm (myoepicardial mantle)
Lining of pericardium	epithelium of pericardial cavity
Transverse sinus	formed by disappearance of dorsal mesocardium (Present between arterial and venous ends of the heart tube)

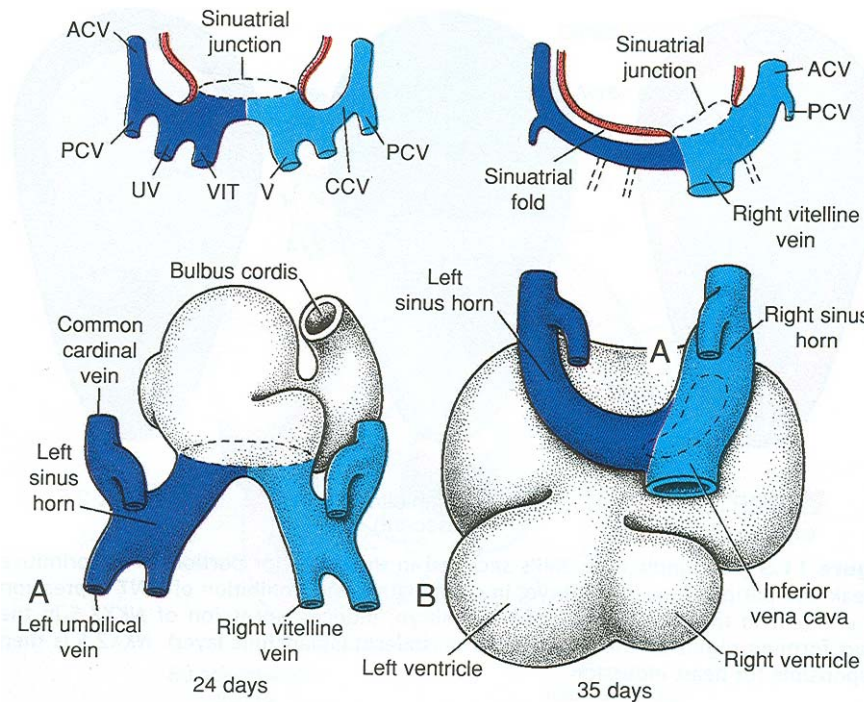
FATE OF SINUS VENOSUS

Left horn of sinus venosus, along with medial part of common cardinal vein forms

coronary sinus

Lateral part of common cardinal vein forms

oblique vein of left atrium



Left venous valve merges with septum secundum.

Right venous valve is divided in three parts by appearance of two transverse muscular bands, called limbic bands.

i) The part **above superior limbic band** forms

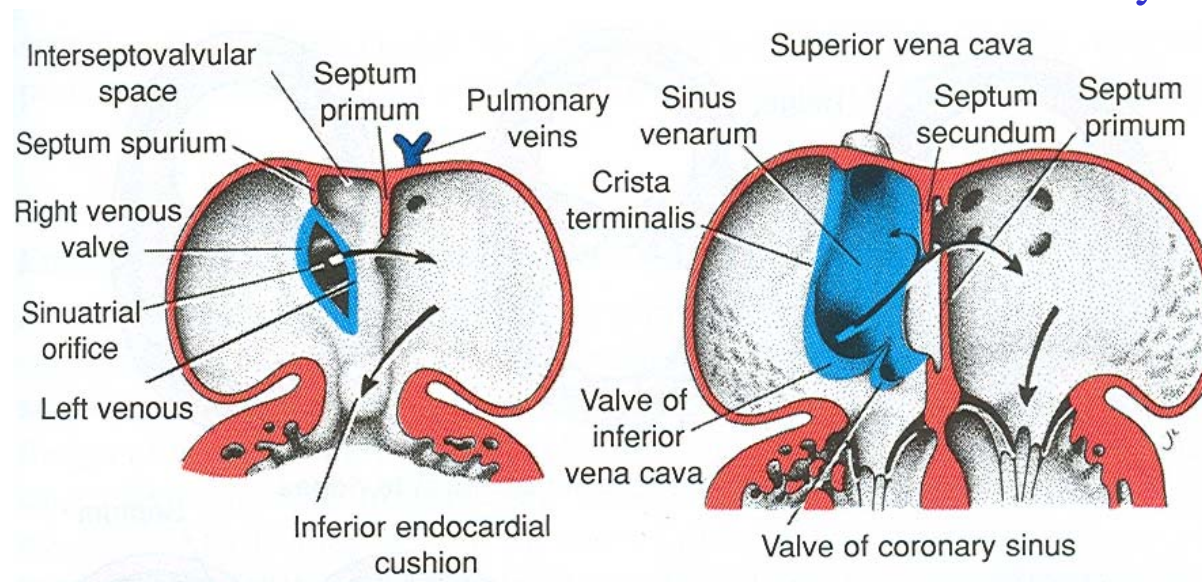
crista terminalis

ii) The part **between the two bands** forms

valve of inferior vena cava

iii) The part **below the inferior limbic band** forms

valve of coronary sinus



INTERATRIAL SEPTUM

i) **Upper**, thicker part is formed by **septum secundum**

ii) **Lower**, thin part (floor of fossa ovalis)

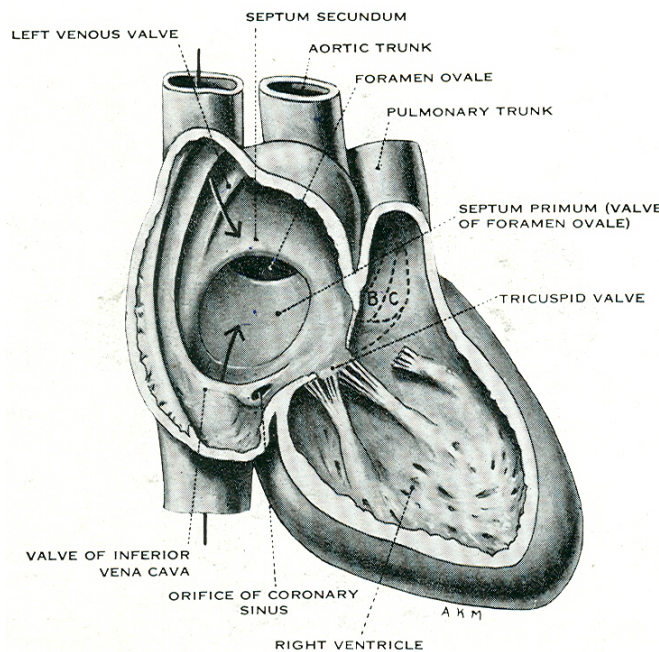
is formed by

septum primum

iii) Sharp **margin of fossa ovalis**

is formed by

lower, curved margin of septum secundum



DEVELOPMENT OF RIGHT ATRIUM

It develops from

1. Right half of primitive atrial chamber (rough part);
2. Absorption of right horn of sinus venosus (smooth part)
and
3. Right atrioventricular canal.

DEVELOPMENT OF LEFT ATRIUM

It develops from

1. Left half of primitive atrial chamber (rough part – confined to the auricle);
2. Absorption of pulmonary veins (smooth part) and
3. Left atrioventricular canal.