

如何学习动物学？

记笔记，复习（预习？）

不要老对着书检查老师到底那些地方和书上的不一样。

第三章 多细胞动物概论

Protozoa

Mesozoa

Metozoa

Protozoa

Mesozoa

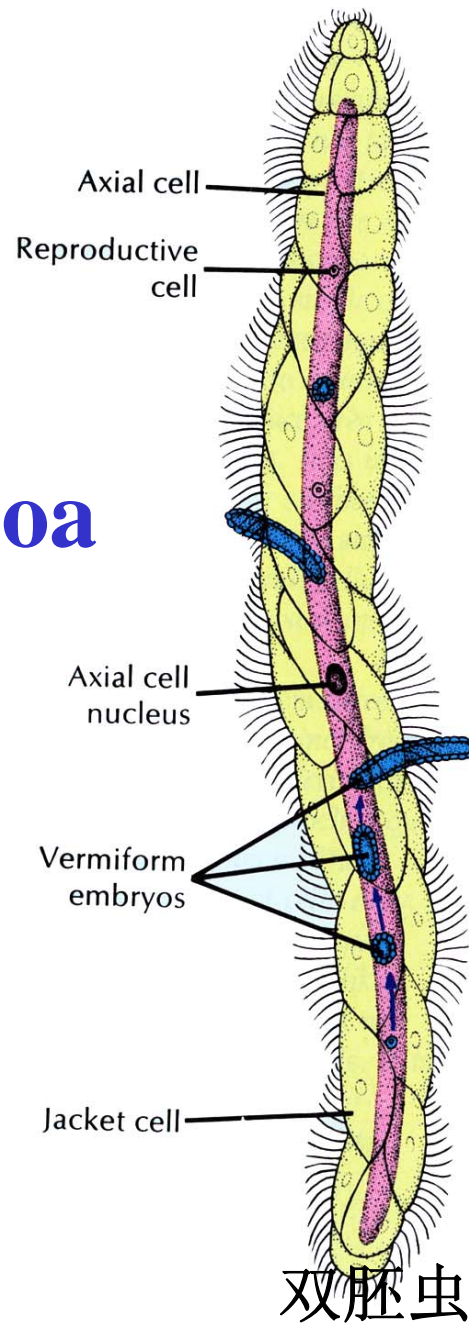
Metozoa

Protozoa

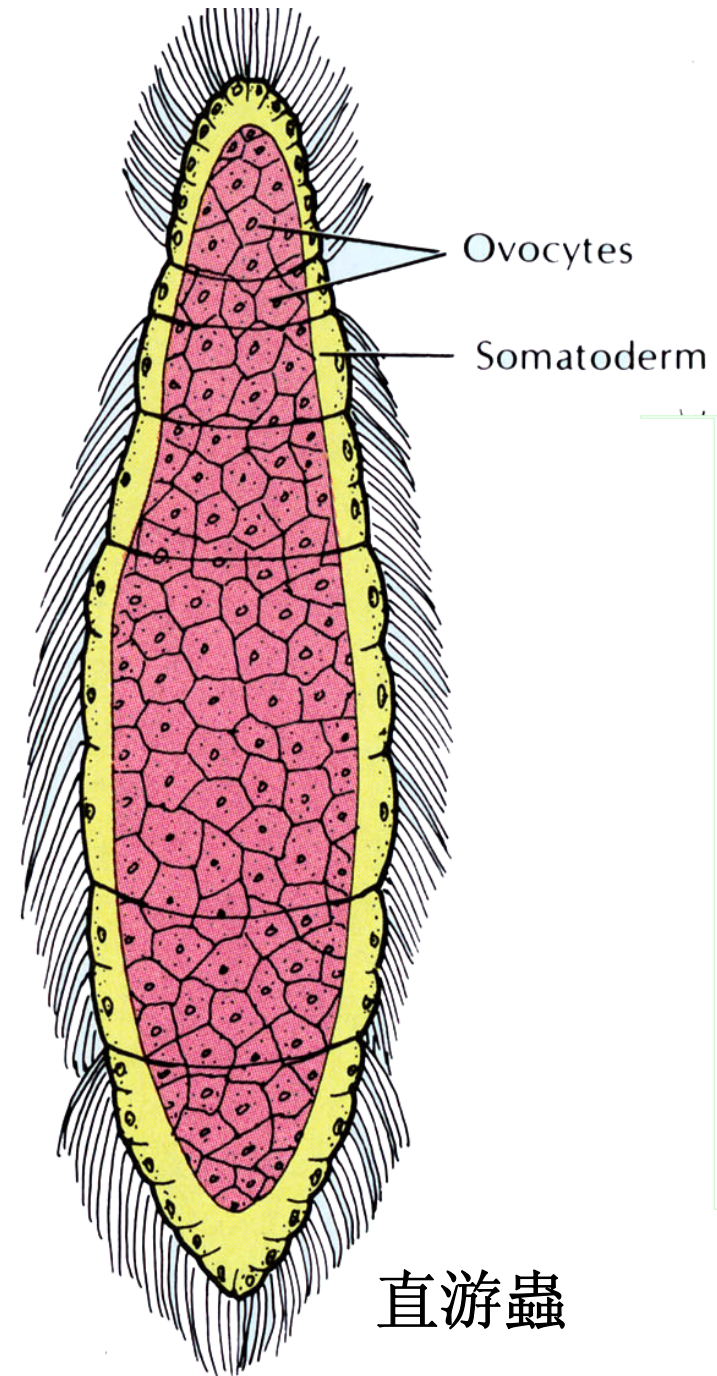
Mesozoa

Metozoa

一、Mesozoa



双胚虫



直游虫

二、多细胞动物起源于单细胞动物的证据

古生物学 形态学 胚胎学

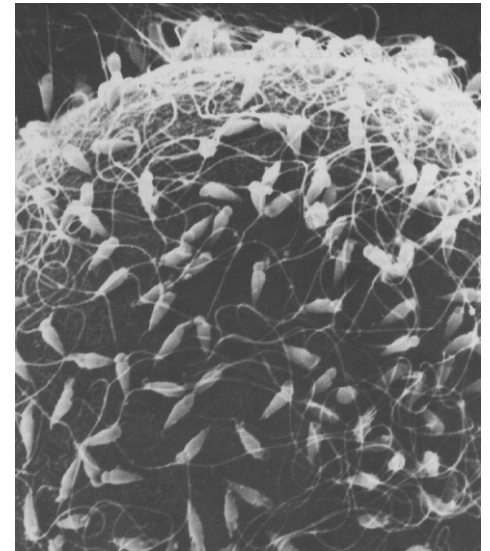
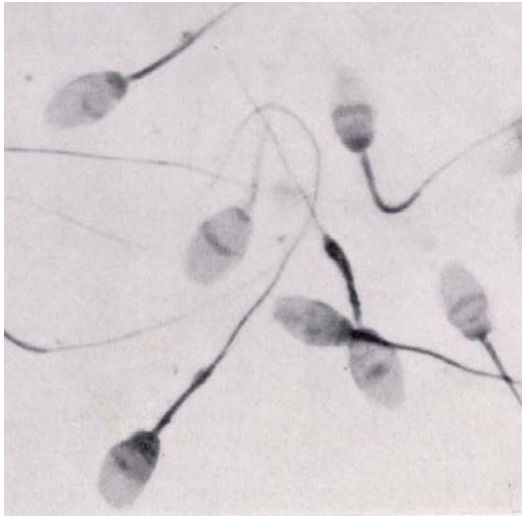
太古代 (46亿)	古细菌和蓝藻
元古代 (18亿)	海绵动物
古生代 (6亿)	生物大爆发
中生代 (2.3亿)	恐龙、鸟类
新生代 (7000万)	哺乳动物

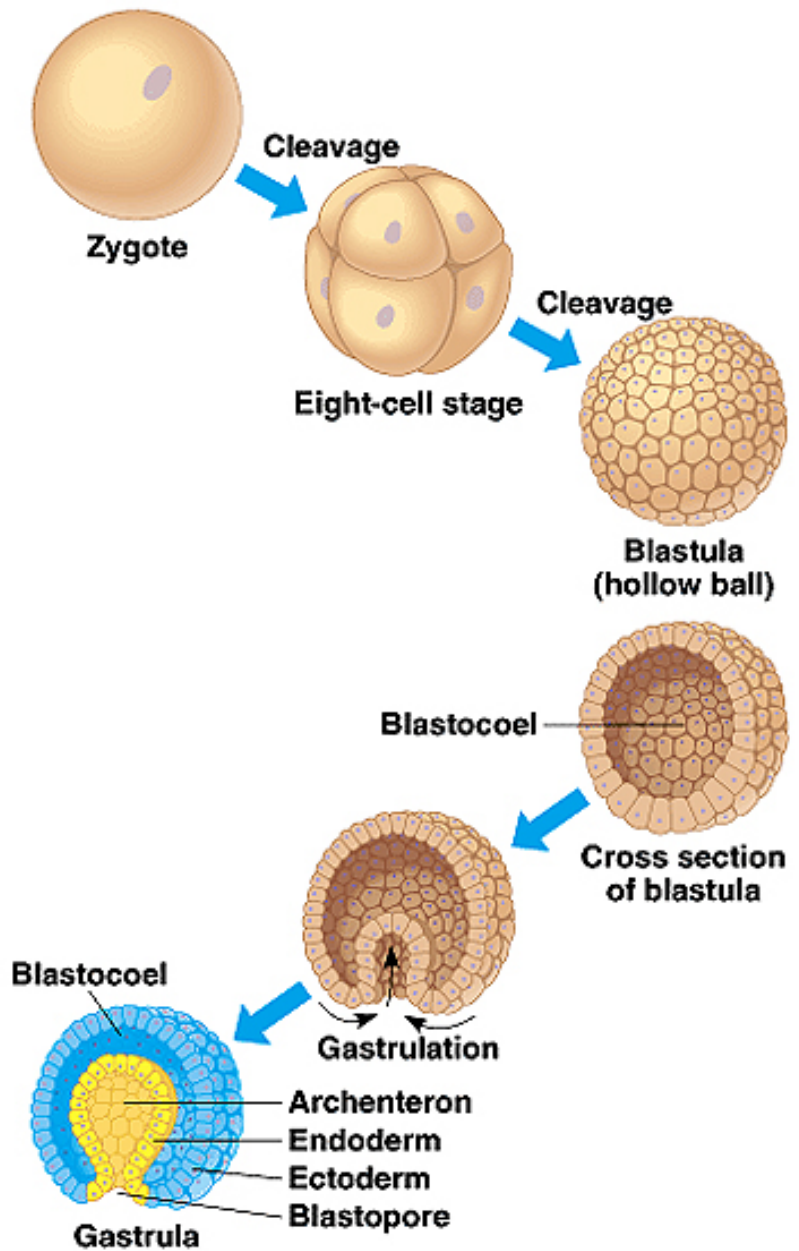
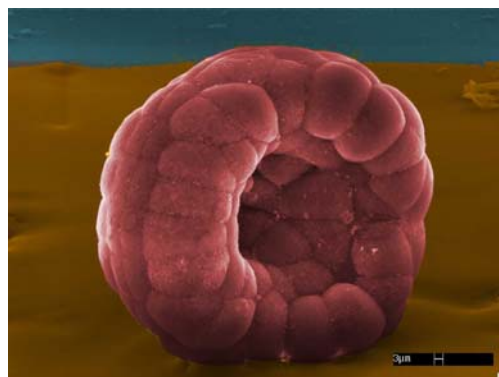
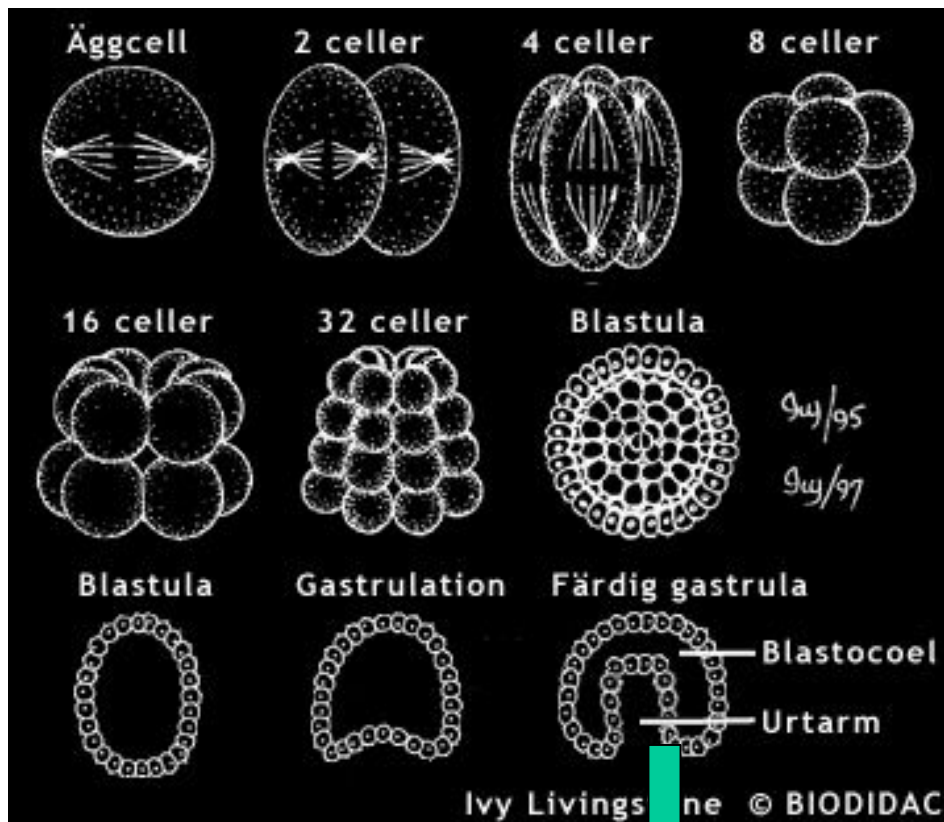
三、多细胞动物的早期胚胎发育

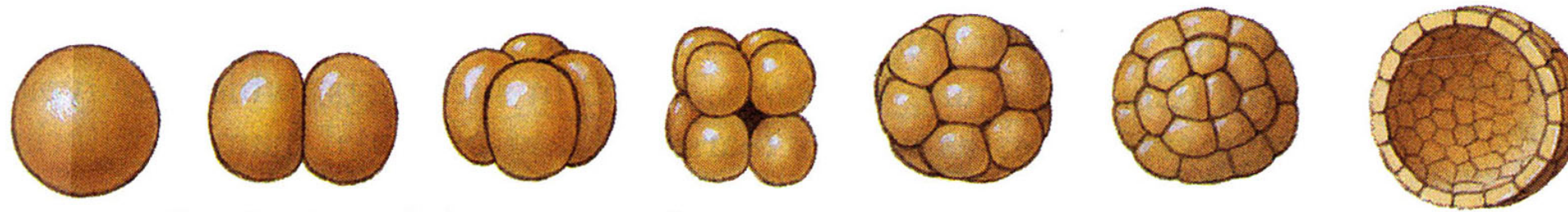
Egg:

	卵黄含量	比重	位置	颜色	细胞分裂速度
动物半球	少	小	上	深	快
植物半球	多	大	下	浅	慢

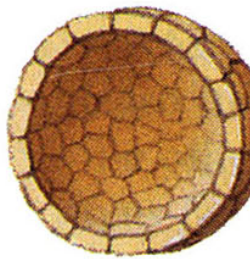
sperm



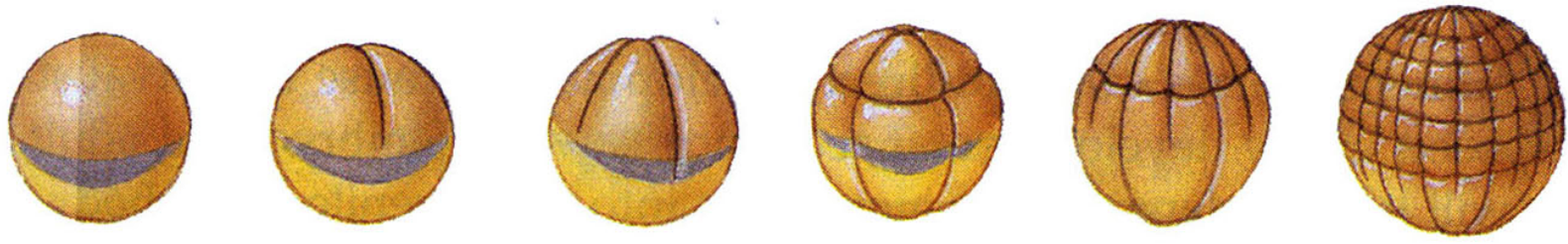




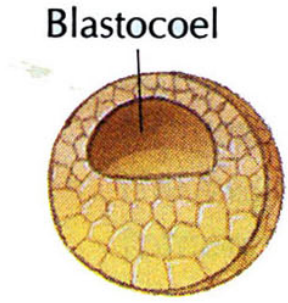
Sea star: Isolecithal egg (sparse yolk, evenly distributed)



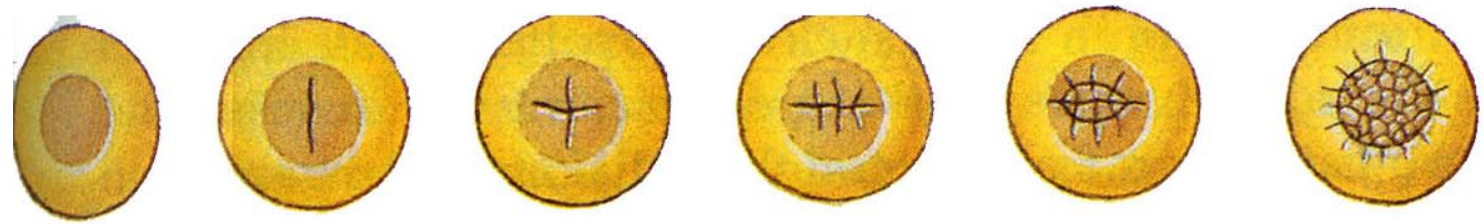
Blastula



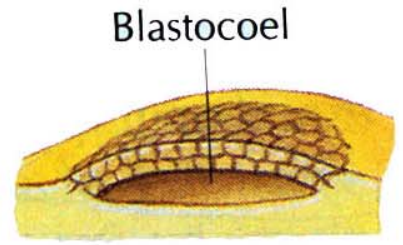
Frog: Mesolecithal egg (moderate yolk, concentrated at end of egg)



Blastula

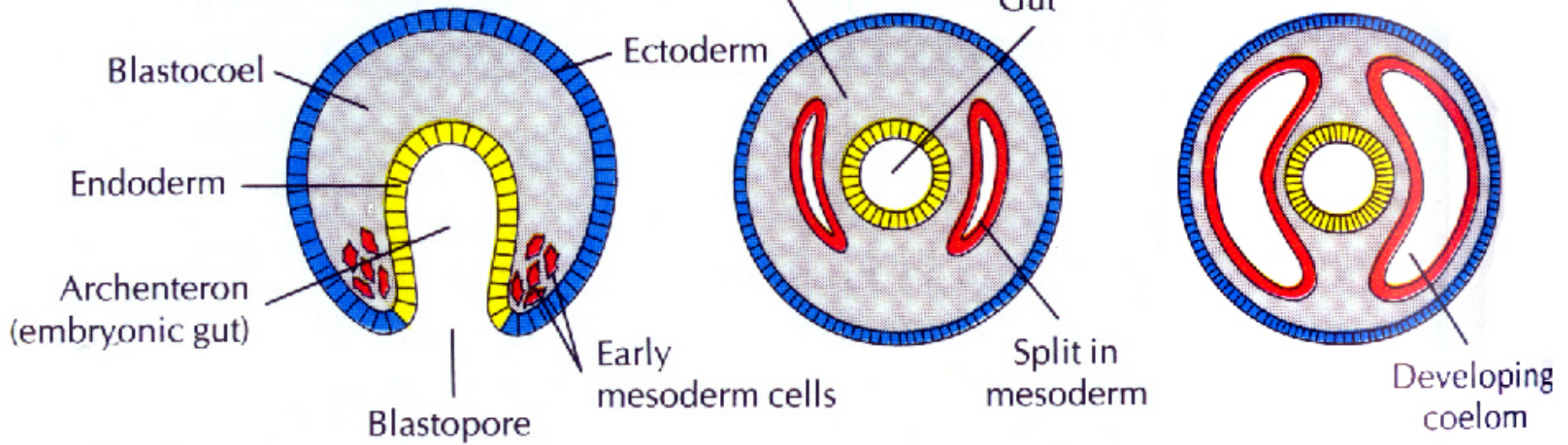


Chick: Telolecithal egg (dense yolk, cytoplasm limited to polar disc)

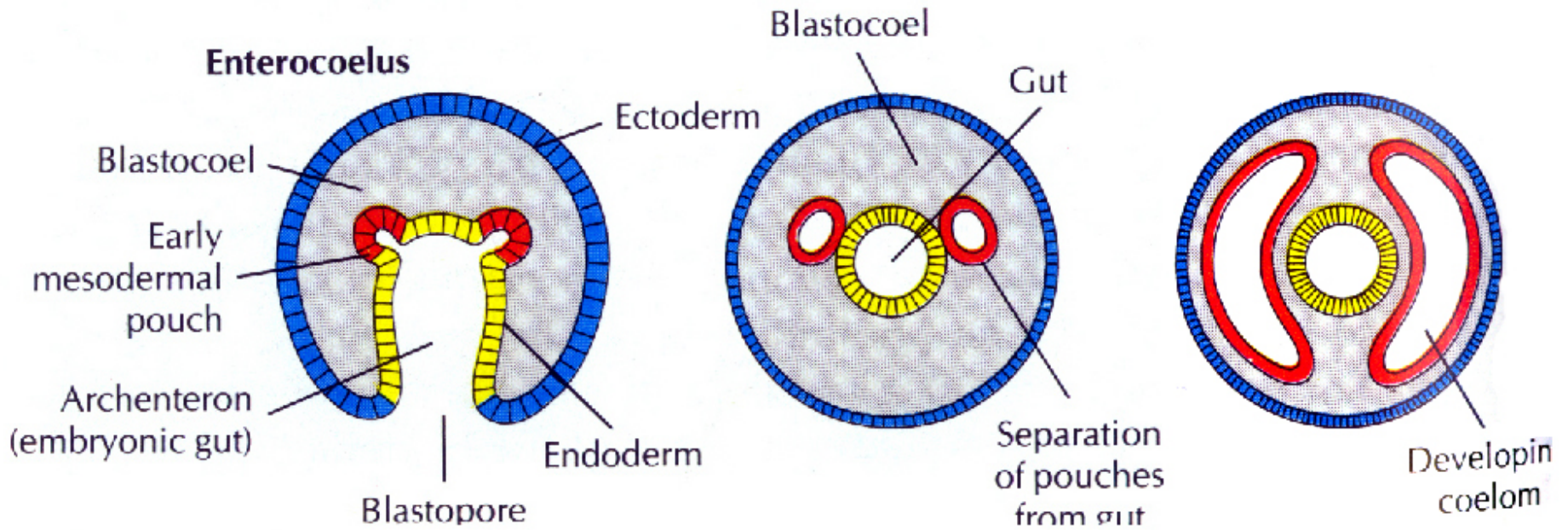


Blastula

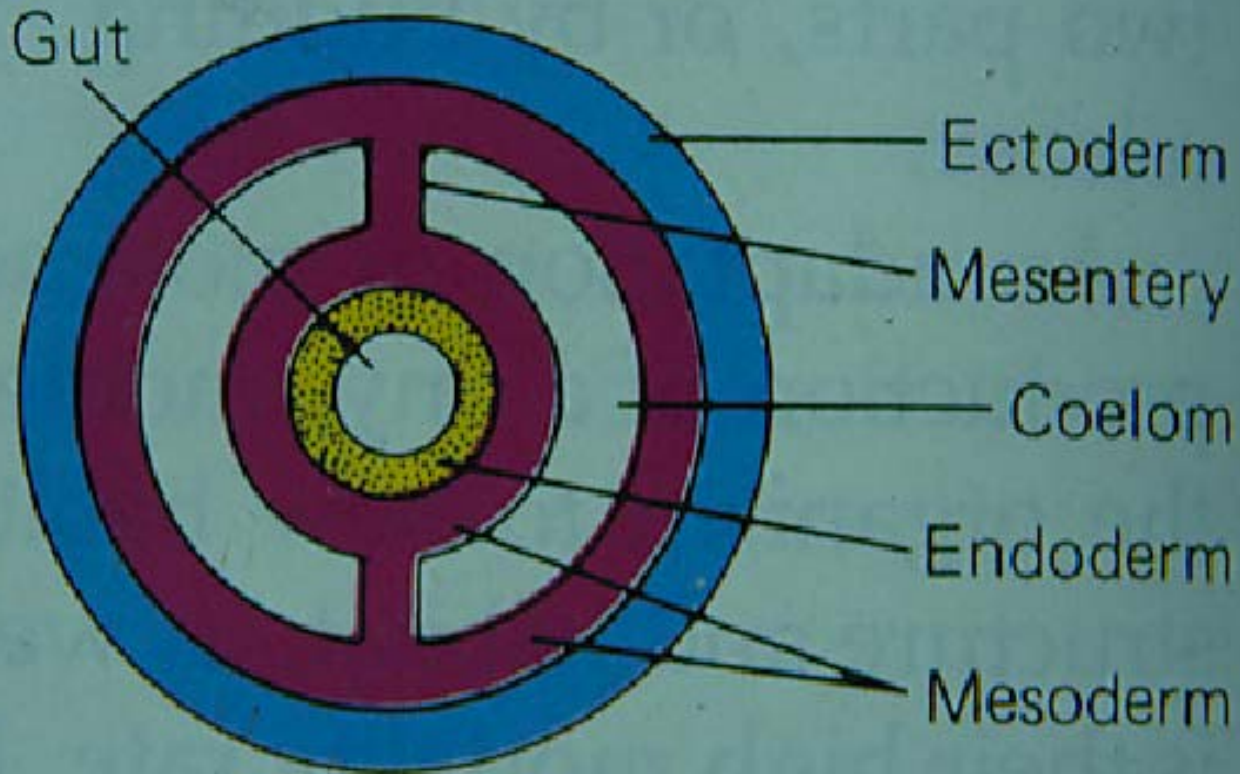
Schizocoelous



Enterocoelous



THREE LAYERS, COELOM
(e.g. ANNELIDA)



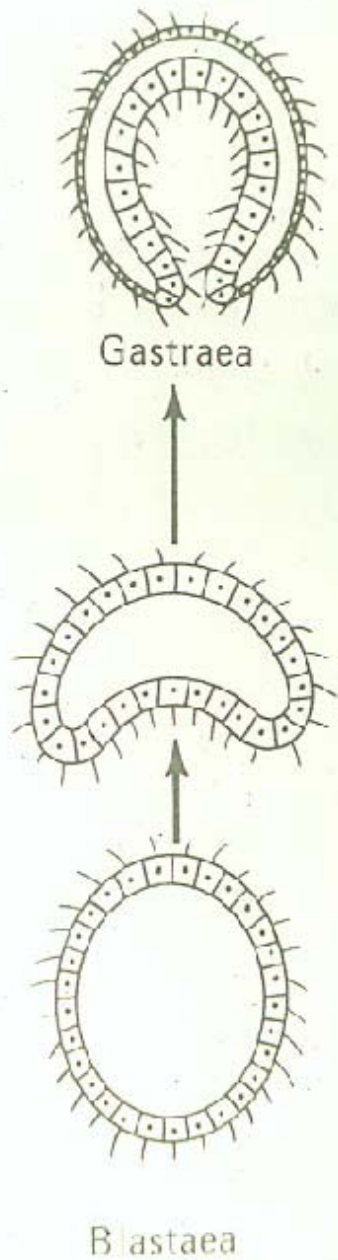
(c)

外胚层 神经系统、感觉器官、表皮及其附属结构

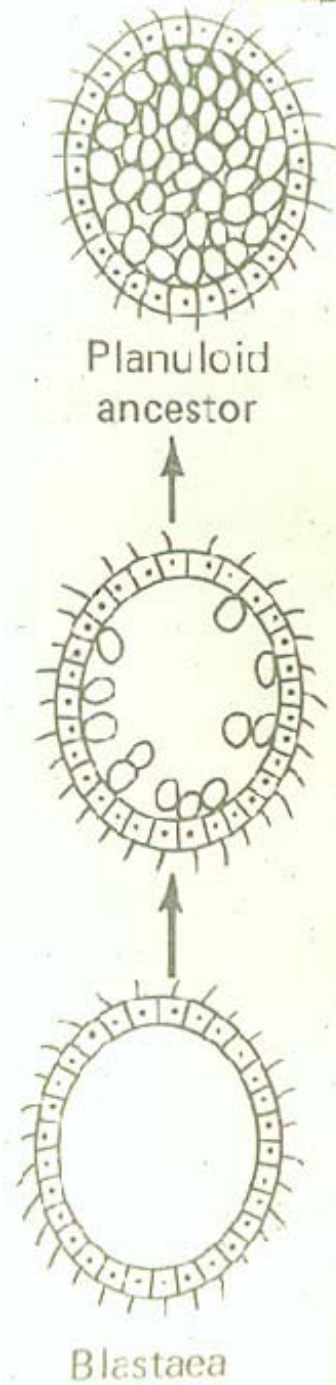
中胚层 骨骼、肌肉、循环系统、生殖系统、排泄系统

内胚层 肝、胰等腺体、消化道、呼吸道的上皮。

黑格尔的原肠虫学说



梅契尼柯夫的吞噬虫学说



四、生物重演律
Biogenetic Law,
Theory of Recapitulation
Ontogeny --- Phylogeny

Supplement

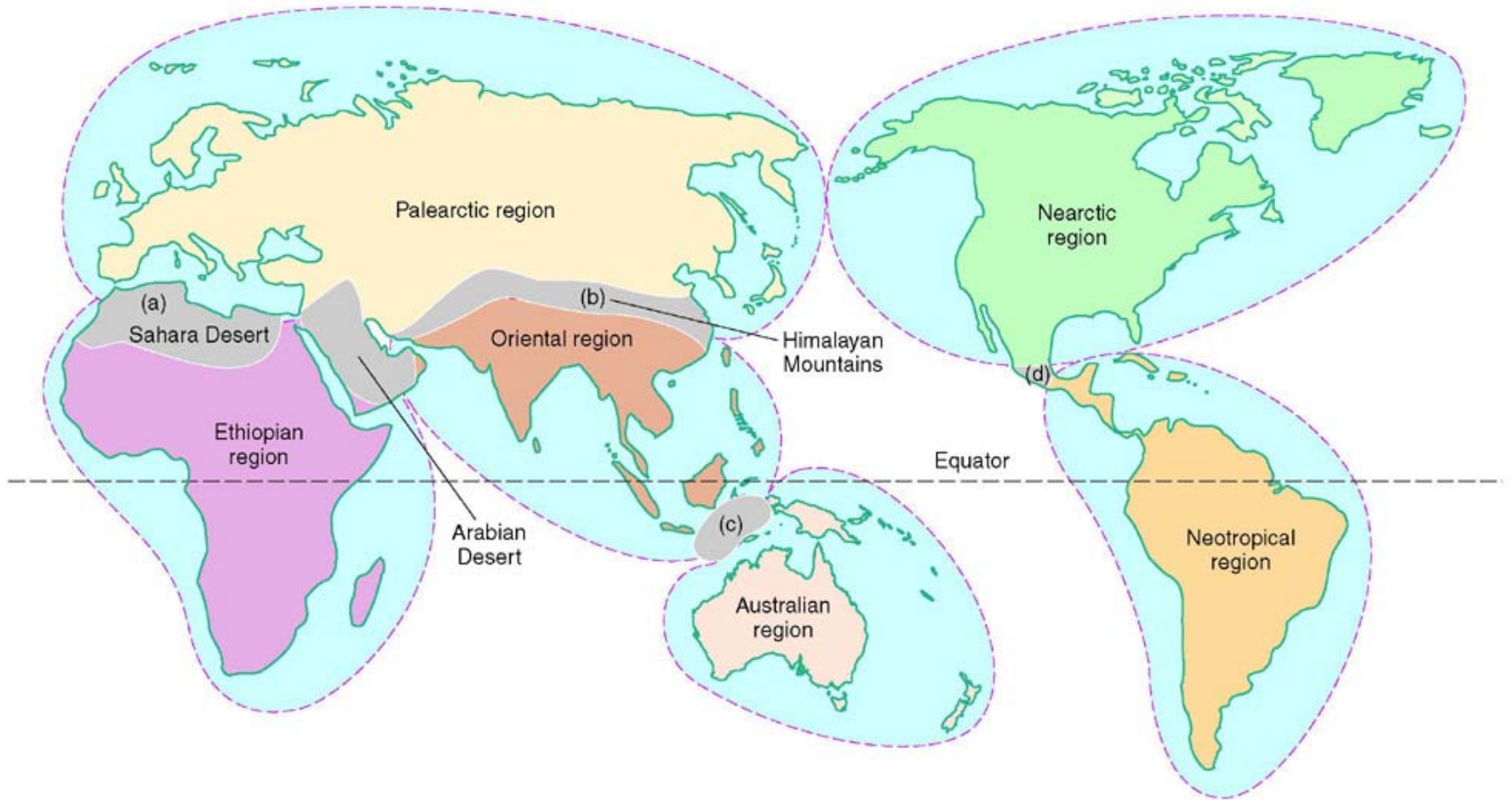
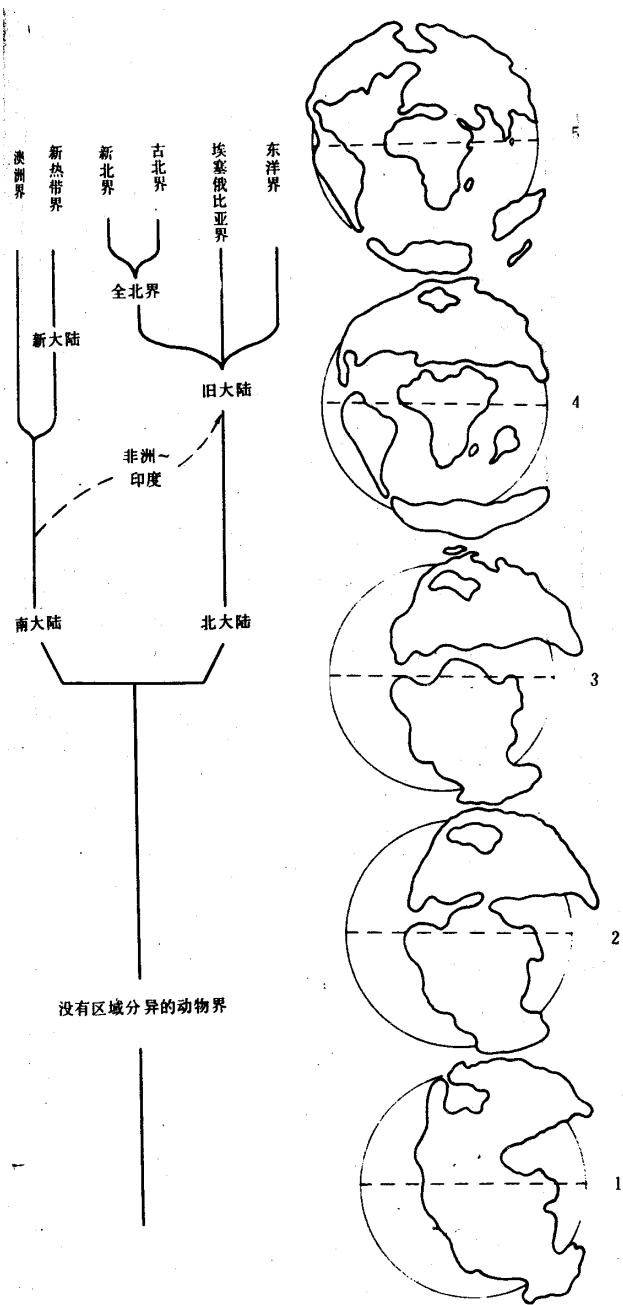


FIGURE 4.2

Biogeographic Regions of the World. Barriers, such as oceans, mountain ranges, and deserts, separate biogeographic regions of the world. (a) The Sahara and Arabian Deserts separate the Ethiopian and Palearctic regions, (b) the Himalayan Mountains separate the Palearctic and Oriental regions, (c) deep ocean channels separate the Oriental and Australian regions, and (d) the mountains of southern Mexico and Mexico's tropical lowlands separate the Nearctic and Neotropical regions.



5. 新生代中期

大洋加宽，除南极洲外，各大陆均有北移的趋势。北移过程中，动物区系位移。非洲与北大陆接触，印度亦同时接受北来的动物区系。

4. 晚白垩纪

南大陆进一步分裂；北大陆多次海陆变迁，全球形成 8 个相对隔离的中心。大陆间动物仍有往来。恐龙绝灭，哺乳类繁荣（ 56×10^6 a 万年中发展了 30 个目，其中有 $2/3$ 现今尚存）。有胎盘动物在北大陆排挤了有袋类。

3. 早白垩纪

联合大陆破裂为二，源于北大陆（劳亚大陆）的恐龙与早期哺乳类已不能到达南大陆（冈瓦纳大陆）。

2. 侏罗纪

联合大陆分裂为二，但有接触，动物区系南北差异类似前一时期。

1. 晚二叠纪—三叠纪

（中二叠纪时合为一超级大陆）
存在条件一致的联合大陆，动物自由来往。恐龙遍布。最早的哺乳类出现于二叠纪，各大陆很少有变异种。三叠纪时有 60 种陆栖脊椎动物，其区系差异类似现代最高级阶元。

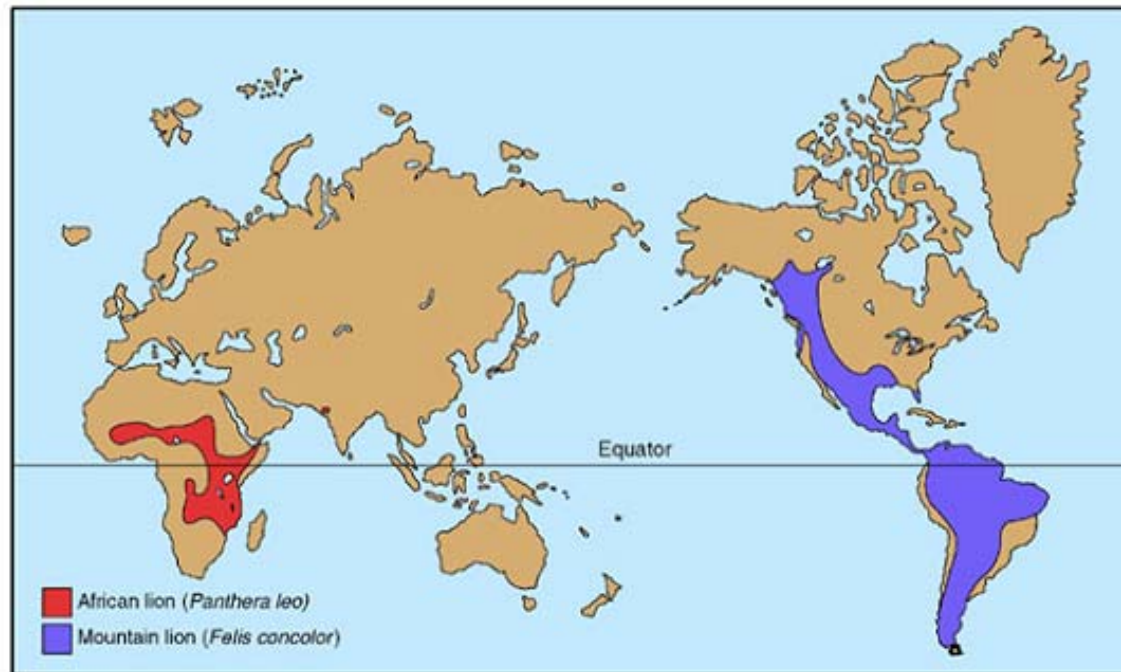
图 7-1 大陆漂移与动物区系分化示意图（据张荣祖）



(a)

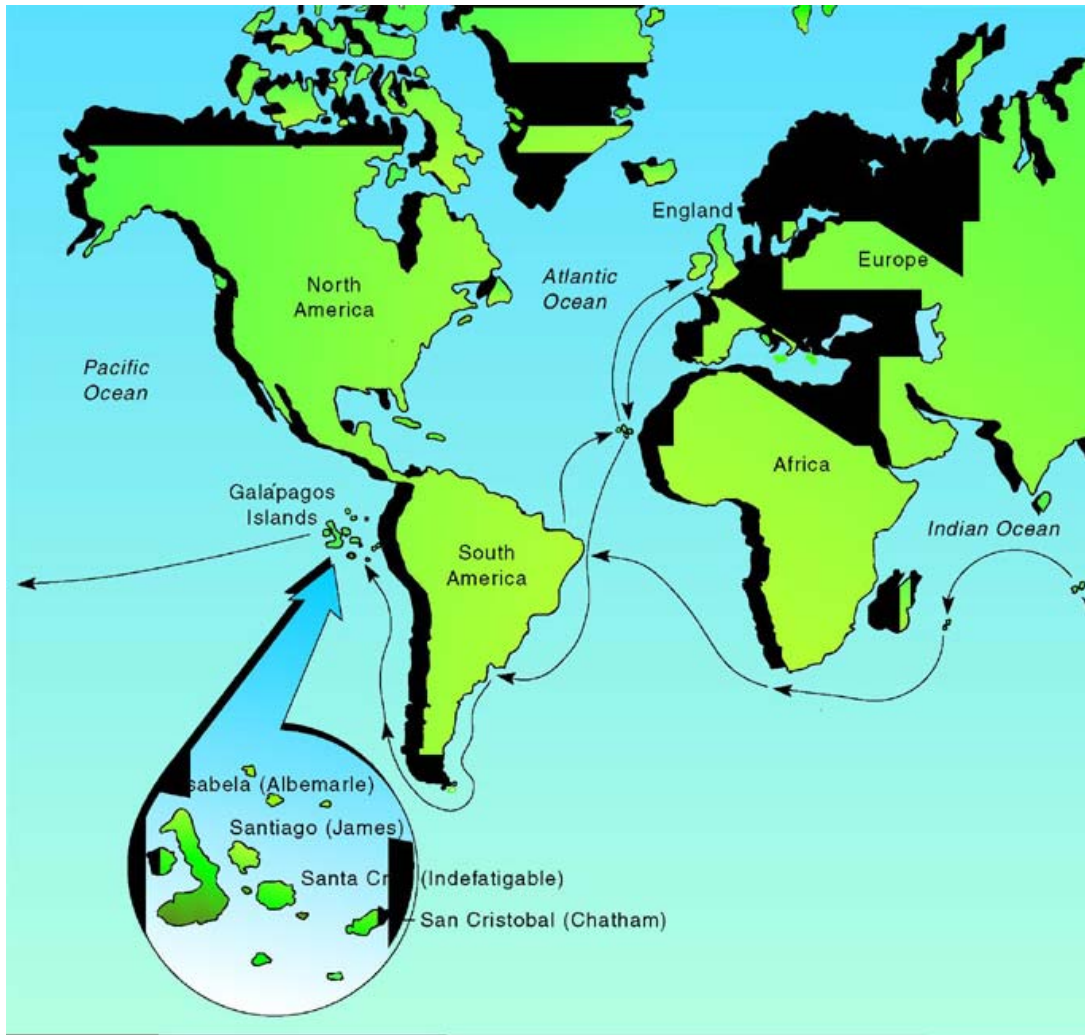


(b)

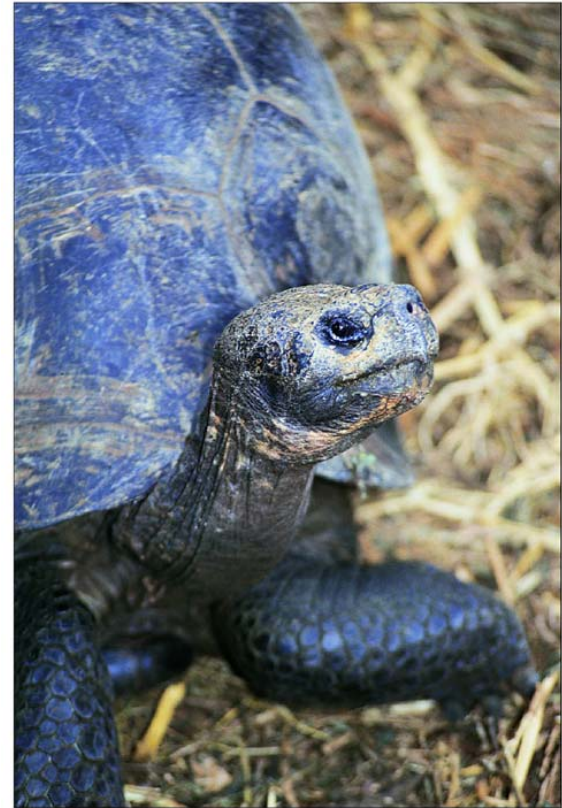


(c)

Biogeography as Evidence of Evolutionary Change. (a) An African lion (*Panthera leo*) has a similar ecological role as a (b) mountain lion (*Felis concolor*) of North and South America. Their similar form suggests a distant common ancestry. Obvious differences, however, result from millions of years of independent evolution. (c) Distribution of lions found in Africa and North and South America.

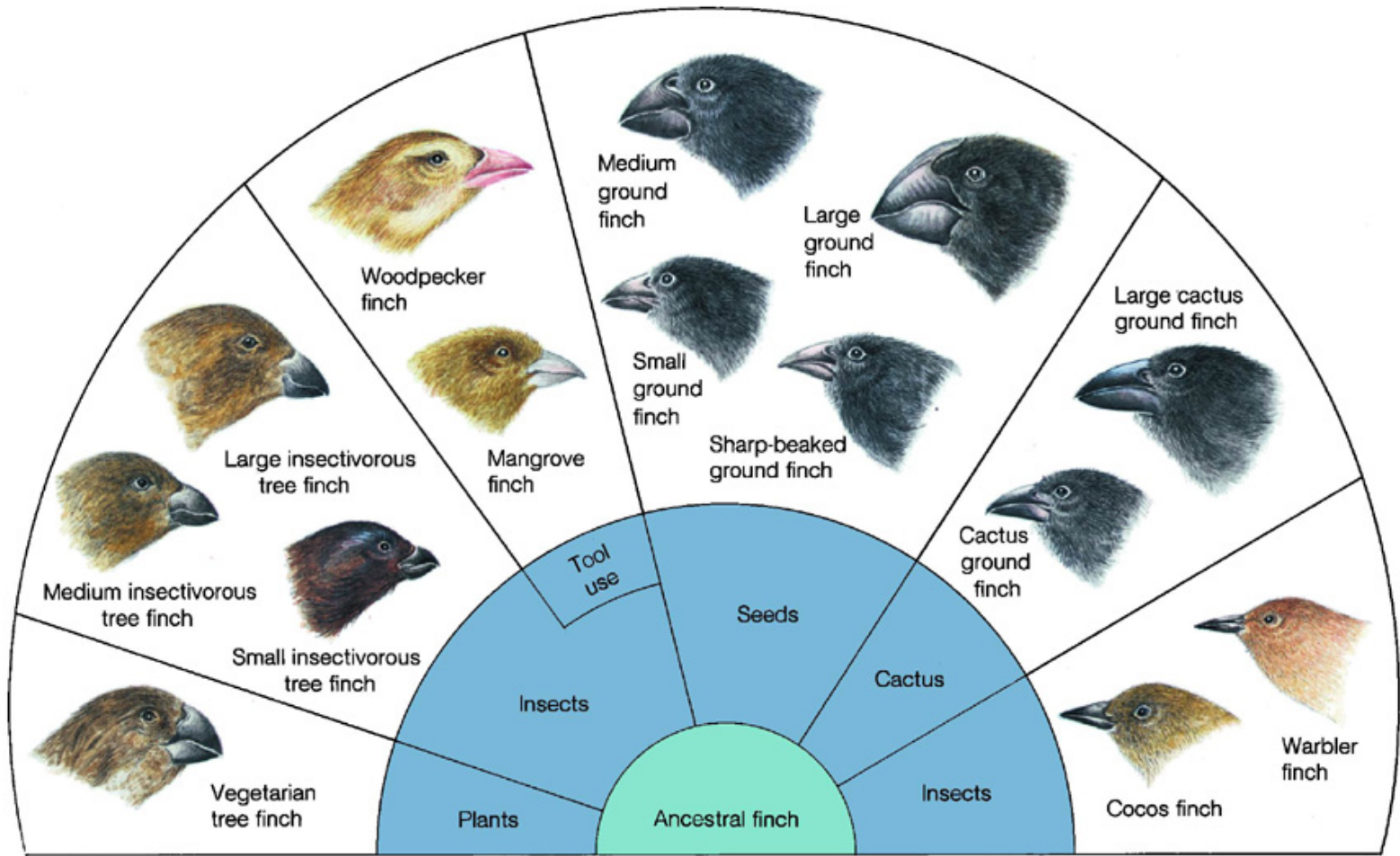


(a)

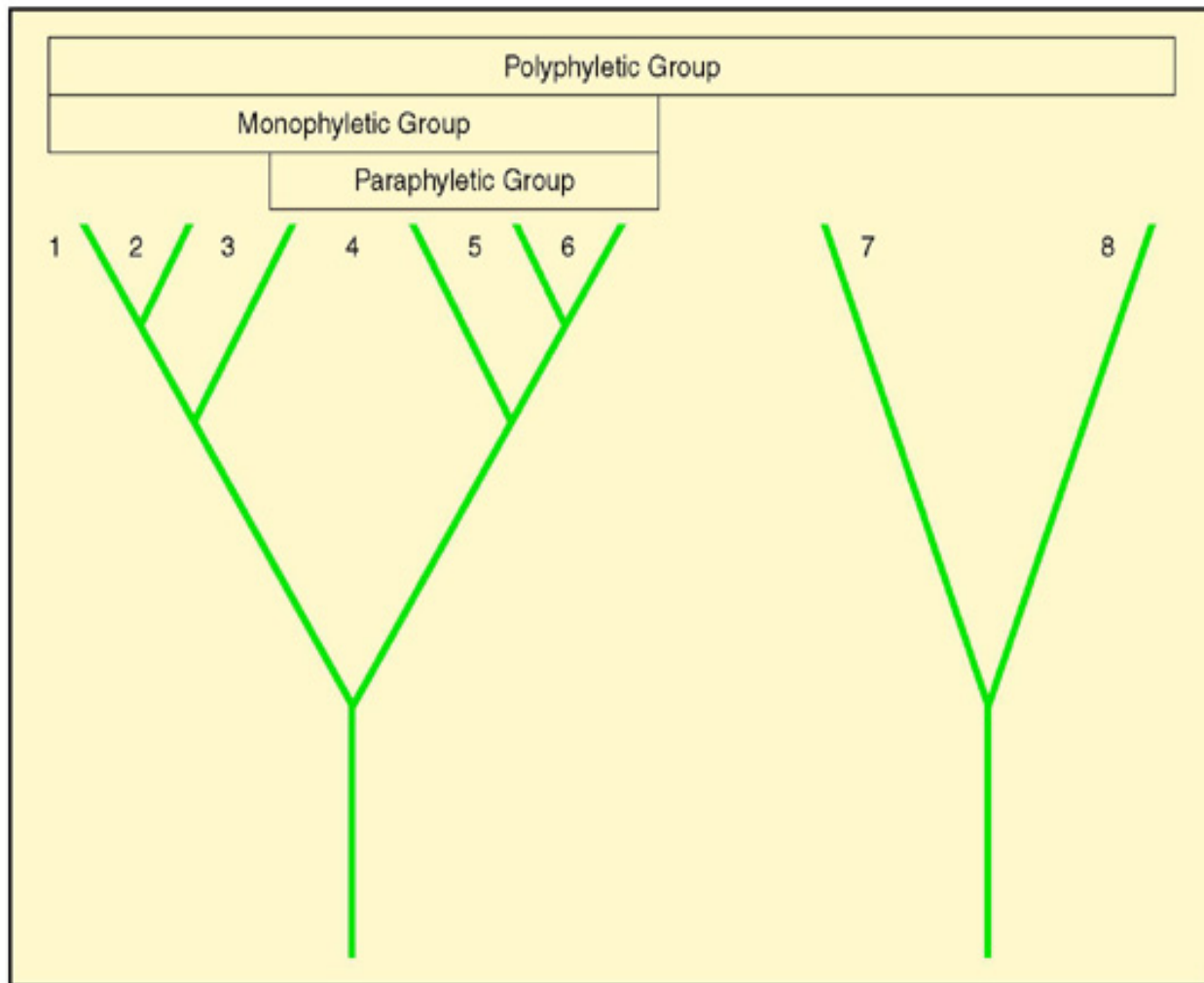


(b)

Galápagos Tortoises. (a) Shorter-necked subspecies of *Geochelone elephantopus* live in moister regions and feed on low-growing vegetation. (b) Longer-necked subspecies live in drier regions and feed on high-growing vegetation.



Adaptive Radiation of the Galápagos Finches. Ancestral finches from the South American mainland colonized the Galápagos Islands. Open habitats and few predators promoted the radiation of finches into 14 different species.



Evolutionary Groups. An assemblage of species 1–8 is a polyphyletic group because species 1–6 have a different ancestor than species 7 and 8. An assemblage of species 3–6 is a paraphyletic group because species 1 and 2 share the same ancestor as 3–6, but they have been left out of the group. An assemblage of species 1–6 is a monophyletic group because it includes all of the descendants of a single ancestor.