

**CHAPTER 29**

1. An ornithologist is a scientist who studies birds.
2. Birds have beaks, feathers, and air sacs.
3. Vane is larger than barb; rachis is larger than afterfeather (this is a hard one); barb is larger than barbule; quill is larger than keratin.
4. Air sacs are air-filled spaces found in the chest and abdomen of a bird. They are continuous with the respiratory system. Air sacs help to make the bird's body lighter than it would be if the air sacs were not present. This facilitates flight. Air sacs also provide a continuous flow of oxygen to the lungs so gas exchange can occur during both inhalation and exhalation. When the bird inhales, fresh air fills the lungs and the air sacs. The lungs perform gas exchange and the air sacs store the fresh air. Then the bird exhales, releasing the air in the lungs (that is high in carbon dioxide and low in oxygen) into the air. Fresh air from the air sacs flows into the lungs and gas exchange continues during exhalation.
5. True.
6. Some birds navigate using the sun, others use the stars, and still others use the Earth's magnetic field.
7. True.
8. The keel is the enlarged breastbone of a bird that serves as the attachment site for the powerful flight muscles.
9. Birds have specialized, light-weight hollow bones and air sacs, both of which make their bodies light.
10. The main difference is in the way they reproduce/bear young. Monotremes reproduce with eggs. Marsupials give birth to very immature young that need to complete development in the pouch. Placental mammals develop a placenta that allows the mother to carry the baby until it is completely developed.
11. True.
12. False. All mammals have a vertebral column.
13. True.
14. False. All mammals have a single lower jaw bone called a mandible.
15. False. All mammals perform gas exchange with lungs.
16. False. Mammal tails, properly called "flukes," contain no bones. They contain muscle and fibrous tissue.
17. According to the evolution model, one kind of organism changed into another kind of previously nonexistent organism; therefore, when looking back into the fossil record, there should be a clear series of changes as one kind of organism evolved into another. Since that is not what is seen, rather what is seen is that there have been no changes to organisms over supposed hundreds of millions of years, this renders false the primary prediction of the evolution model (Darwin even said himself that if no type of transition form was to be found in the fossil record, then his theory would be false).
18. True.
19. Echolocation is the use of soundwaves to locate objects in the animal's environment. The mammalian orders of Cetacea and Chiroptera are capable of echolocation.
20. The area of the brain in question is the cerebrum. It is responsible for thinking.
21. An ungulate is a hoofed mammal.
22. False. Not all mammals are viviparous. Monotremes are ovoviparous.
23. False. Human and mammal organ systems function in much the same way.