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CHAPTER 1: The Cat

READING NOTES

1. **Longitudinal** – In anatomy, this term refers to something extending from the head toward the tailbone. A lateral line would be perpendicular, extending across the width rather than the length.
2. **Transverse** – There are multiple body planes that are used to describe how anatomical parts are located in relation to each other. One such plane is the transverse plane. The transverse plane can be thought of as a flat plane, separating the body in half, perpendicular to the spine in an animal.
3. **Quadruped** – An animal that walks on four feet.
4. **Organic and Inorganic** – An organic substance contains the element carbon and is often associated with things that exhibit characteristics of life. An inorganic substance does not contain carbon. When talking about the living world, most substances will be organic, while inorganic substances are more commonly studied when examining the non-living thing.
5. **Nitrogenous** – Something that is nitrogenous contains the element nitrogen. In animals, when describing nitrogenous tissues, this implies that the animal forms amino acids, necessary for building protein in the body. The cat is used for this example, while plants are mentioned as being non-nitrogenous. This is reasonable, as plants do not produce protein the way that a cat or other animal does.
6. **Carbonic Acid** – Carbonic acid is a molecule composed of hydrogen, carbon, and oxygen that plants use to obtain the carbon they need to be organic (i.e., living) things.

COMPREHENSION QUESTIONS

1. Why is the cat valued as a domestic animal?
It is clean and orderly in its habits and an effective hunter of mice.

2. What is the Latin word from which the name "cat" derives?
Catus. The adjective *catus*, *-a*, *-um* means sharp or cunning, and the other Latin word for the cat, *feles*, *felis*, is sometimes used to name a thief.

3. Why does it seem likely that the cat would have been first domesticated in Egypt?
As the granary of the ancient world, Egypt had large stores of wheat, and thus ample fodder for mice. It seems likely that the cat would have been domesticated in order to hunt mice. The medieval custom of making the killer of a cat pay a fine in the form of a sum of grain further supports this theory.

4. How is the domestic cat chiefly different from the wild cat?
The wild cat is a much larger, thicker, more powerful, and more fierce animal.

5. What is the normal life span of a domestic cat?

Usually about twelve years and occasionally as long as eighteen.

6. How many kittens might the owner of a mated pair of cats expect to have every year?

With a female cat having three or four litters per year and generally five or six kittens per litter, the owner should expect to see from fifteen to twenty-four new kittens every year!

7. Why is knowing the history of the domestic cat and its various breeds not "scientific knowledge" in the most strict sense?

Scientific knowledge in the most strict sense is the knowledge of causes. Only the knowledge of causes will allow us to give a compelling answer to the question "What is a cat?"

8. Why is it important to recall that we naturally learn by making distinctions?

Because when we remember that point, our learning will be more easily won and retained. By continually asking "What is it?" and "How is it different from what I already know?", our little steps will give us solid gains of knowledge.

9. What does it mean to say that an organism is a "complex whole in which all the parts are reciprocally ends and means"?

The different parts of the body have different but complementary tasks, and each of them needs the others in order to perform its own activity.

10. Which four chemical elements are the principal ones into which living things can be dissolved after death?

Carbon, hydrogen, oxygen, and nitrogen.

11. What does it mean to say that an organism is "made up" of these elements?

It means that it can be more or less readily dissolved into them after its death.

12. Should an organism be understood to be a collection or mixture of these elements?

No; while it is alive, the living thing is one continuous whole made up of different parts.

It is not a mixture; it is an ordered whole.

13. How do living things differ from non-living things?

Living things differ from non-living things by the powers of taking in food, growing from within, and reproducing according to their kind. They are also ordered wholes.

14. What are the most basic activities shared by all animals—that is, those activities that indicate they are both alive and animals?

The taking in of food, growth, reproduction, movement, and sensation.

15. How can we negatively characterize the difference between all animals and plants?

Animals are unable to nourish themselves by converting non-living elements into the fabric of their own bodies, and they have no cellulose.

16. How are the higher animals, such as the cat, further differentiated from plants?

Higher animals are primarily different from plants in their powers of locomotion and sensation; further differences include the reception of food into an internal cavity, their non-treelike external form, their incapacity to reproduce by budding, and the importance of the element nitrogen to their physical constitution.

17. What, then, is an animal?

An animal is a living thing with the powers of sensation and locomotion that must obtain its food from other living things.

CHAPTER 13: The Groundhog

READING NOTES

1. **Viviparity** – The quality of reproducing by giving birth to live young.
2. **Ectothermic** – Gives off heat.
3. **Endothermic** – Takes in heat.
4. **Dentition** – The arrangement and condition of teeth in an animal.
5. **Mastication** – Chewing, grinding up food before digesting.
6. **Setae** – A stiff, hairlike structure.
7. **Torpid** – Mentally and/or physically inactive, lethargic.

COMPREHENSION QUESTIONS

1. Why is the study of mammals generally more interesting and important than the study of other animals?

Because we share more in common with mammals, and they tend to have a larger role in our lives. Further, we too are mammals, and thus to study them is to begin to study ourselves.

2. What are the four things, used here in our consideration, that characterize mammals?

Endothermy (being warm-blooded), hair, specialized teeth, and viviparity (offspring not being born in eggs).

3. What insight into mammalian life can we have from the characteristic of being warm-blooded?

Being warm-blooded is associated with the fact that mammals are higher-energy animals, tending to be more actively and consistently engaged in the world around them.

4. What special place does hair have in mammalian life?

Since hair provides insulation, it is an important support for being warm-blooded. It also fundamentally determines how mammals will appear to other animals around them.

5. What is unique about the dentition of mammals?

Mammals have teeth of several kinds, allowing them to have more complex eating habits.

6. What does the dentition of mammals especially reveal?

The dentition of mammals especially reveals their eating habits and thus their broader living habits.

7. What important aspect of mammalian life is caused by being viviparous?

Mammals give birth to live babies that then nurse from their mothers, meaning that mothers, and sometimes fathers, have a close association with offspring for some length of time.

8. How are rodents distinct from mammals?

Rodents are distinct from mammals only as a more specific kind is distinct from the more general kind to which it belongs. All rodents are mammals, but not all mammals are rodents.

9. What is rodent dentition, and what can we learn from it?

Rodents have two large incisors on the top and bottom in the front of their mouth, and instead of canines, there is a space behind the incisors, followed by the molars. This dentition is well-suited to their generally herbivorous habits (they do sometimes also eat insects).

10. What is significant about dentition in animals for our study of natural history?

Dentition well-suited to the flourishing of animals does not come about by random or accidental causes, but rather is a significant instance of order in nature.

11. How do the limbs of a groundhog compare to human limbs?

A groundhog is said to have four legs, as opposed to two legs and two arms. The feet of the hind legs have five toes, just as human feet, while the fore-feet have four toes and the rudiment of a thumb.

12. Where do groundhogs live?

They spend much time in their burrows in the ground, though they venture forth, especially in morning and evening, to feed in areas nearby.

13. How is the groundhog's body well-suited to where it lives?

The groundhog has short, powerful limbs with curved strong claws that are good for digging.

14. Are groundhogs edible?

Though most today would not eat groundhogs, in bygone times many people ate them as an inexpensive or readily available source of food.

15. What is hibernation?

Hibernation is a sleeplike state in which certain animals, such as the groundhog, pass rather long periods of time, normally in winter.

16. Why does Audubon praise God the Creator after a consideration of the hibernation of groundhogs?

In the hibernation of groundhogs we see a wonderful design wherein the need of these animals for food is fulfilled while they would otherwise be unable to endure the rigors of winter.

17. When do groundhogs have their young?

As with most mammals living in the wild, they give birth in spring and spend a good part of the summer raising their young.