Reading Part 2

Taxonomy and Scientific Knowledge

Most people think of science as a set of facts about the world. But more fundamental to science than the facts are the methods. In fact, many theorists believe that it is not objective reality that steers science, but rather the method of science that determines what we come to know as real. This reversal of what is commonly thought is exemplified by the development of taxonomy, the method of identifying and classifying organisms. Modern taxonomy, primarily developed by Carolus Linnaeus in the 18th Century, initially gave scientists a greater and more precise knowledge of nature. Today, however, taxonomic advances have led scientists to question what they thought they knew about basic biological reality.

The main idea of the Paragraph One:

a) Knowledge of nature and old-fashioned taxonomy

b) Taxonomy used to be one thing, but now it might be something else.

c) Most people think of science a set of facts about an unreal world.

Taxonomy has been in use since Aristotle's work in the fourth century B.C.E. But early taxonomies were not very scientific. Many contained such mythological creatures as griffins, right alongside existing animals. Further, it was thought that offspring could be produced by mating completely different creatures, like a lion and a bird. Aristotle, himself, used reason, rather than observation, to divide animal life into two basic groups: animals with vertebrae (or backbones), and those without. Although this system proved inaccurate, it wasn't until Linnaeus' work that empirical observation became the basis for a modern taxonomy that excluded creatures of fantasy.

The main idea of the Paragraph Two:

a) This paragraph was based on observation rather than reason.

b) It did not include creatures from mythology.

c) Aristotle began taxonomy; he classified animals and strange 'unreal' creatures.

The movement toward a more modern system took its first big step in the 17th Century, with naturalist John Ray's definition of the concept "species." A species is a group of organisms capable of reproduction. The result will be an individual similar to the parents and also capable of reproducing. Armed with this definition, Linnaeus was able to catalog over 4,000 species of animals and over 7,500 species of plants. He began with plant-life, dividing plants into species based on the number of pistils and stamens (the sexual organs) of each plant. This method allowed other botanists to contribute to the taxonomy. They simply had to observe and count, and a new specimen was added. Thus, biological knowledge grew tremendously.

The main idea of the Paragraph Three:

a) Linnaeus was able to catalog over 11,500 species of animals.

b) Linnaeus made a big improvement on Aristotle's work.

c) Aristotle developed a modern taxonomy better than Linnaeus's work

However, since Linnaeus' time, biology has developed new taxonomic systems. One such example, cladistics, makes use of genetic analysis to classify organisms based on evolutionary descent (parent and child), rather than observable features. The problem is that this system has revealed relationships that are quite different from those of Linnaeun taxonomy. Furthermore, organisms have been discovered that violate the rules of species inclusion. An example is where one organism may be able to reproduce with another, while that other one is capable of reproducing with a third, but the first and third cannot reproduce with each other. These and other surprises have scientists today questioning whether we understand species at all. Do species actually exist in nature, or only in our taxonomies? Perhaps this question will lead to new methods and technologies that will, in turn, radically change the nature of reality as we know it.

The main idea of the Paragraph Four:

a) Linnaeus wasn't perfect and today biologists make even more improvements.

b) Linnaeus's work showed more facts than the latest versions of taxonomy

c) Aristotle developed a modern taxonomy better than Linnaeus's work

ABOUT THE READING

Reading Part 2 - Example A Question 1

The word 'mythological' as used in the second paragraph most closely means the same as:

a) inspiring
b) religious
c) old-fashioned
d) unreal

Reading Part 2 – Example A Question 2

Question: The author mentions the example of 'cladistics' in the last paragraph in order to:

a) show how a new taxonomic method leads to new views of reality
b) provide an example of Linnaean taxonomy
c) show how John Ray's definition of species still holds true
d) show how the theory of evolution has not really been proven

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Reading Part 2 – Example A Question 3

Click on a circle [●] to insert the new sentence into the passage. To change your answer, click on a different circle.

Choose the correct option:

a) "A"
b) "B"
c) "C"
d) "D"

Below is an example of the second type of question in Reading Part 2. After reading the passage, insert the new sentence in the passage where it makes sense.

Thus, a horse and a donkey, although appearing similar, are not the same species, since their mating leads to a sterile animal, the mule.

Taxonomy and Scientific Knowledge

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Taxonomy has been in use since Aristotle's work in the fourth century B.C.E. But early taxonomies were not very scientific. Many contained such mythological creatures as griffins, right alongside existing animals. Further, it was thought that offspring could be produced by mating completely different creatures, like a lion and a bird. ***A** *Aristotle, himself, used reason, rather than observation, to divide animal life into two basic groups: animals with vertebrae (or backbones), and those without. Although this system proved inaccurate, it wasn't until Linnaeus' work that empirical observation became the basis for a modern taxonomy that excluded creatures of fantasy.*

The movement toward a more modern system took its first big step in the 17th Century, with naturalist John Ray's definition of the concept "species." A species is a group of organisms capable of reproduction. The result will be an individual similar to the parents and also capable of reproducing. ***B** *Armed with this definition, Linnaeus was able to catalog over 4,000 species of animals and over 7,500 species of plants. He began with plant-life, dividing plants into species based on the number of pistils and stamens (the sexual organs) of each plant. This method allowed other botanists to contribute to the taxonomy.* ***C** *They simply had to observe and count, and a new specimen was added. Thus, biological knowledge grew tremendously.*

However, since Linnaeus' time, biology has developed new taxonomic systems. One such example, cladistics, makes use of genetic analysis to classify organisms based on evolutionary descent (parent and child), rather than observable features. The problem is that this system has revealed relationships that are quite different from those of Linnaeun taxonomy. ***D** *Furthermore, organisms have been discovered that violate the rules of species inclusion. An example is where one organism may be able to reproduce with another, while that other one is capable of reproducing with a third, but the first and third cannot reproduce with each other. These and other surprises have scientists today questioning whether we understand species at all. Do species actually exist in nature, or only in our taxonomies? Perhaps this question will lead to new methods and technologies that will, in turn, radically change the nature of reality as we know it.*