

**OVERVIEW:** The theistic worldview of science traces the beginning of scientific endeavor to the Garden of Eden where the Creator asked Adam to name the created kinds (beginning of taxonomy) and to identify their relationship to humankind and to other creatures (beginning of ecology). The Genesis account of created *kinds* and later Aristotle's *Scala Naturae* (Scale of Nature) both taught that organisms were static forms which do not evolve. The Christian worldview is credited with the emergence of experimental sciences in medieval Europe. These Christian scientists viewed *science* (which they called *natural philosophy*) as a way to understand the natural world in order to know and enjoy the Creator and to exercise biblical stewardship. However, by the 18<sup>th</sup> century, naturalism, a worldview which denied the existence of supernatural causes in nature, emerged. Naturalism is expressed in Darwinian teaching that species originated from simpler forms by descent with modification through natural selection.

**EMPHASIS:** The emphasis of this assignment is to compare the creation and evolution models of origins and to observe the effects of origins postulates on taxonomic classification of autotrophic creatures. Specifically, we will examine the following themes:

1. What are the major postulates underlying the evolution and creation models?
2. Which model best accounts for the discontinuities in the current fossil record?
3. Can convergent evolution account for the existence of similar traits in taxa that appear to have very different evolutionary ancestry?

**READING:** This assignment is intended for two lecture meetings. Please read pp. 267-270 of Ch 15; then, at page 270 begin skimming Stern's discussion of *microevolution* and *natural selection*, familiar to you from earlier biology courses. Finish Chapter 15 by carefully reading the Discussion on pp. 276-277. Then, read the short Chapter 16 which will refresh your memory on taxonomic classification. The Study Outline below highlights the emphasis to be given in lecture-discussions.

## STUDY

### OUTLINE & QUESTIONS:

I. Naturalistic Science and the Scriptures: In Chapter 15, page 276, Stern states the following:

*Science deals with tangible facts and evidence that can be measured or experimentally tested; beliefs stemming from metaphysics or religion are outside the realm of science to prove or disprove.*

A. Respond to the following questions:

1. What is there about the statement with which you would agree?
2. To what extent does metaphysics or religious faith have a role in science?

B. Exercise – Classification, Science, and Scripture:

The following “creatures” were collected in “Botwannaland,” have never been observed or studied, and were brought back, photographed, and now are available to you to taxonomically classify.



Please observe the characteristics of each “species” and then answer the following questions as best you can. Keep the questions in Part A above in mind as you reason through this exercise.

1. Classify the four creatures by assigning each of the “species” to a higher taxonomic group (*e.g.* a genus, family, or higher group as you deem appropriate. Assign Latin names if you wish.
2. How many higher groupings (taxa) did you include in your classification? \_\_\_\_\_
3. List the criteria you used to classify the Botwannaland creatures?
4. Which Botwannaland species are most closely related?
5. From a naturalistic evolution standpoint, which might have evolved most recently?
6. What postulate (s) or presupposition are you employing to answer #4 above?
7. What postulate (s) or presupposition are you employing to answer #5 above?
8. What knowledge is needed to verify your claims in #4 and #5?

II. Origins Postulates<sup>1</sup>:

**Postulate = "a hypothesis advanced as an essential *presupposition* of a train of reasoning"**

- A. Evolution Postulates – presuppose that undirected natural causes account for the origin of life
1. All life evolved from one (or a few) simple kind(s) of organism. See Figure 16.4
  2. The greater the similarity between two groups, the closer is their [phylogenetic] relationship"
- B. Creation Postulates – presuppose Scriptural authority and a supernatural agent of creation
1. God created distinct *kinds* of living organisms by supernatural acts.
  2. Discontinuities between major kinds in both extinct and extant forms serve as both an evidence for creation and a basis for taxonomic classification.

## III. Interpretations based upon the above postulates:

A. Evolution Inferences

1. *Fossil Record*, though incomplete, contains records of gradual descent with modification
2. *Homologous Traits* (characteristics shared by different species but from related genes) in different taxonomic groups suggest descent from common ancestor

Suggest an Example: \_\_\_\_\_

3. *Convergent Traits* are those which cannot be explained by common ancestry (or related genes)

Suggest an Example: \_\_\_\_\_

4. *Natural Selection* (differential reproduction resulting from selection pressures from the environment) is analogous to *artificial selection* under control of a geneticist; this process is the mechanism behind both macro- and micro-evolution

B. Creation Inferences:

1. *Fossil record* lacks *transitional forms* necessary to support alleged phylogenetic sequences

Quote #1: See your text by Stern, at the end of "Discussion", page 277

*Fossils represent a very small fraction of organisms that once existed. With incomplete evidence, scientists can deal only in probabilities, and it is inevitable that different interpretations result.*

[Note: Stern, 10<sup>th</sup> ed.: "possibly fewer than one in each million organisms...ever became a fossil, and there are very few fossils of herbaceous and soft-bodied organisms."]

Quote #2: Woodland, D.W. 2000. *Plant Systematics*, 3<sup>rd</sup> ed. Andrews U. Press, Barrien Springs, MI. *Evolutionary relationships were hypothesized first from the remains found in the fossil record and later from the comparative data of both living and extinct organisms. The fossil record in almost all cases was very incomplete and inconclusive. Paleontologists hoped that a logical progression could be found throughout the fossil history of a group, but this was rarely the case. ...the resulting diagrams and evolutionary "trees" and "bushes" explaining the relationships between the higher taxonomic levels are therefore largely speculative and subject to variation with the biases of the individual biologist who postulates them.*

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<sup>1</sup> This is a broad classification of origins views and does not distinguish *theistic evolutionists* who postulate that the Creator God used natural laws to bring organisms into being over time.

2. *Homologous Traits* can as much be the expression of the plan of one intelligent designer as to be an expression of common ancestry.

Question: Can a creationist accept the existence of homology within kinds? Example?

3. *Convergent Traits* are explainable by creation models which allow for supernatural creation of kinds that are very different from each other but which are endowed with similar genes.
4. *Natural Selection (NS)* is evident in the changes in gene frequency in response to environmental change or limitations. However, it is unlikely that NS could serve as the agent of undirected natural causes to “design” complex traits, each controlled by gene complexes and networks of regulatory genes.

IV. Aims of Taxonomy – to represent the relationships among species that reflect our understanding of their origin, whether by creation or evolution

A. IDENTIFICATION – describing and naming species: Essential to communication and data retrieval

1. "New world" discovery produced a host of new species, hence....
2. Need for organized system
3. LINNAEUS (1753) - *Species Plantarum*
  - a. Included Latin *phrase names*, with *binomial* name in margin
  - b. Many of these names still accepted by *Intern. Code of Bot. Nomenclature*

B. CLASSIFICATION -- grouping related species into genera, grouping genera into families, etc.

1. A \_\_\_\_\_ Classification – based upon easily recognized plant characteristics
  - a. Example: popular field guides use number of flower parts or color
  - b. Benefits: Convenience, ease of usage by amateurs
2. N \_\_\_\_\_ Classification – based on presuppositions about origins. Three Approaches:
  - a. Distinct "kinds" (Gen. 1:11-27) -- Linnaeus (1753) and John Ray saw species as fixed entities, with limited biological change within and discontinuity between “kinds”
  - b. Phylogenetic – assumes evolution produced an identifiable line of descent (*continuity*)  
 Classification Bessey (1915) *et.al.* -- sought to form groups (taxa) to portray lines of evolutionary descent (Fig 16.4)
  - c. Cladistics - arrangement of species or higher taxa in *cladograms* based upon closeness of *shared-derived character states* rather than phylogenetic trees based upon supposed primitive transitional forms. See Figure 16.5

QUOTE\*: Cladistics, which is, of course, an anathema to new-Darwinians, is favored by those who prefer not to transcend the observable data in their theorizing to "speculate" about genealogical relationships. -- D. Oldroyd (1986) *Biology and Philosophy* Vol. 1:133. Proponent of evolution who raises serious questions; taken from W.R. Bird's articles in *Creation Res. Soc. Quarterly* 25 (1988): 28-35 and 74-81.

Table 1. TWO VIEWS OF CLADISTICS – Compare your Text (p 287-88.) view with Colin Patterson’s (1982) view:

CLADOGRAM FEATURE	Cladistic Approach	Phylogenetic
Reference supporting each:	Colin Patterson ( <i>New Scient.</i> 1982)	Stern., <i>Introductory Plant Biology</i>
Purpose of Cladogram:	Show Pattern of Characters	Show Pattern; but also Process, Descent
Nodes	Shared Characters	Divergence. between 2 lines of evol.
Forking (Diverging) Lines	Immaterial	Branches representing common ancestor

- d. Baraminology – a creation-based classification approach that seeks to organize previously overlooked patterns of *discontinuities* in empirical data for the purpose of defining boundaries of created kinds or *holobaramins*

Reference: Wise, K.P. 1992. Practical Baraminology. *Creation Ex Nihilo Tech. Jour.* 6:122-137

#### V. Problems in Phylogenetic Classification – A Case for You to Consider:

Question: List as many diverse groups of animals and plants that have wings or wing-like morphology as you can.

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1. How many different phyla have you represented? \_\_\_\_\_ [Recall zoology and see text, Table 16.2?]
  2. How does an evolutionary biologist account for the appearances of a wing in different taxonomic groups (*taxa*) in the phylogenetic sequence using the reasoning of the “Theory of Descent with Modification by Natural Selection”? See Figure 16.4 and related reading in Chapter 16.
  3. How does he or she distinguish whether a given wing is the result of homology or convergence?  
Example: See [Creation Matters 9\(2\): 6 2004](#) – Can Evolution Create Homologous Structures by Different Paths?  
[Pepperpots (anther cones) in nightshade flowers not homologous.] and also, *Gene* 331:1-7 (2004), both on S:\drive
  4. How would you account for the wing from a “Creation by Design” view?

"For I am well aware that scarcely a single point is discussed in this volume on which facts cannot be adduced, often apparently leading to conclusions directly opposite to those at which I have arrived. A fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question; and this cannot possibly be here done."

– Charles Darwin, "Introduction, *Origin of Species* (1859)

GENERAL BOTANY

NAME \_\_\_\_\_

Take-at-Home Quiz #3 (SA #14-15)

Lab Section (circle one):    T    W    R

**INSTRUCTIONS:** After completing your reading assignment, write answers to the questions below. You should have this quiz completed and ready to hand in when requested during lecture either on or after the date of the assignment to which this quiz is attached. Work alone, or you may work with others, but be sure you are mentally involved in answering the questions to assess your progress and to stimulate additional learning.

1. Naturalistic Science and the Scriptures: In Chapter 15, page 276, Stern states the following:

*Science deals with tangible facts and evidence that can be measured or experimentally tested; beliefs stemming from metaphysics or religion are outside the realm of science to prove or disprove.*

a. What is there about the statement with which you would agree?

b. With what aspect(s) of the statement if any would you disagree?

2. Two of the “major postulates. of evolution” are listed in this Study Outline, in part II.A. State one or two empirical (experimental) observations from geology or biology which appear to contradict Darwinian evolution postulates concerning origins.

a. Observation #1:

b. Observation #2