

Introduction to Biology. Lecture 2

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Outline

- 1 Questions and answers
 - Comments to introductory test

- 2 Age and time. Basic principles
 - Geological time
 - Some basic principles



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Interesting in being a note taker?

- Disability Services is looking for a note taker in this class. The individual will be paid for taking notes.
- Interested students who will have **consistent attendance** and take complete and legible notes should contact:
- **Melanie Moore**, Student Health and Development Center:
Lower level Lura Manor (must enter through South Door facing University Ave) or call 858-**4233**



Questions and answers

Comments to introductory test



Question 1

1 Why deciduous plants take off their leaves?

- ☐ A To prevent freezing
- ☒ B **To prevent drying**
- ☐ C To get rid of poisonous chemicals



Question 2

2 Where does human digestion process start?

- ☒ A **In the mouth**
- ☐ B In the intestines
- ☐ C In the stomach

Amylase and lipase



Question 3

3 Which birds do NOT live in Minot on winter?

- A Crows
- B **Hummingbirds**
- C Sparrows



Question 4

4 Home country of watermelon:

- ☐ A Central America
- ☐ B Canada
- ☒ C **South Africa**



Question 5

5 Why do insectivorous plants eat insects?

- ☐ A **To obtain the lacking mineral resources**
- ☐ B To get an addition to their common “menu”
- ☐ C To get rid of herbivores



Question 6

6 Which insects have no queen?

- ☐ A Bumblebees
- ☐ B Ants
- ☒ C **Cockroaches**



Bumblebees

Question 7

7 Oak tree is pollinated by:

- ☒ A Wind
- ☐ B Bees
- ☐ C Flies



Oak flowers

Question 8

8 Spider has:

- ☐ A 6 legs
- ☒ B **8 legs**
- ☐ C 4 legs



Question 9

9 Apple flower has:

- ☒ A **5 petals**
- ☐ B 4 petals
- ☐ C 3 petals



Question 10

10 Frightened man has:

- ☒ A **Bigger pupils**
- ☐ B Smaller pupils
- ☐ C Normal pupils



Question 11

11 Polar bears are not eating penguins because:

- A Penguins run very fast
- B **They cannot meet**
- C Penguins are poisonous for bears



■ POLAR BEAR DISTRIBUTION (approx.)

Question 12

12 How many toes are on each of cat's hind legs?

- A 5
- B 4
- C 3



Question 13

13 Pineapple is a:

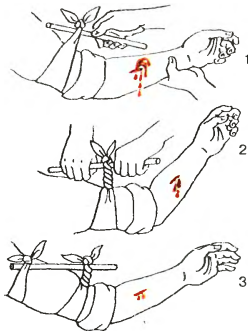
- ☐ A Tree
- ☐ B Shrub
- ☒ C **Herb**



Question 14

14 If somebody has an artery cut on the arm or leg, it is recommended:

- ☐ A Put a tight bandage below the cut
- ☒ B **Put a tight bandage above the cut**
- ☐ C Do nothing



Question 15

15 Which of the following is the most precise statement?

- ☐ A We are breathing to support our life
- ☒ B **We are breathing to obtain the energy from food**
- ☐ C We are breathing to have enough strength for food consuming



Question 16

16 Which tree is better to plant in Minot house backyard:

- ☐ A Sycamore
- ☒ B **Ash**
- ☐ C Yew



Question 17

17 Moles eat:

- ☒ A **Worms**
- ☐ B Roots
- ☐ C Frogs



Question 18

18 Which fish gives birth to the fully developed offspring?

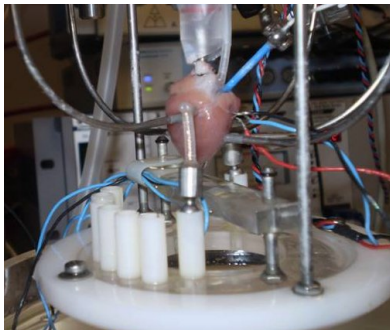
- ☐ A Sturgeon
- ☒ B **Shark**
- ☐ C Flounder



Question 19

19 Which human organ lives longer?

- ☒ A **Heart**
- ☐ B Lungs
- ☐ C Brains



Question 20

20 Which plant normally has a longer root?

- A Spruce
- B **Chokecherry**
- C Blueberry



Fallen spruce tree

Age and time. Basic principles

Geological time



First attempts to calculate age of Earth (1830–1850)

- Helmholtz calculated that if Sun is shrinking to obtain the energy, then the age of Earth should not exceed 18 My (millions of years, 18,000,000 years)
- Lyell calculated that if the **speed of sedimentation was the same in the past**, then age of Earth should be approximately 200 My

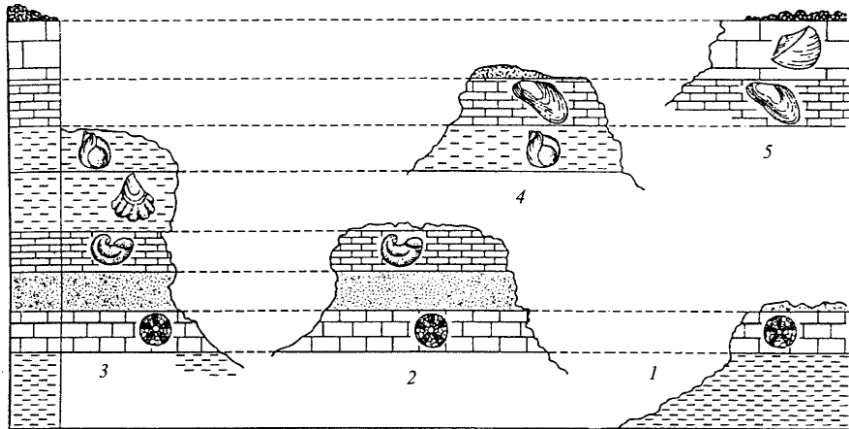


Stratigraphy

- Upper layers are younger than lower
- Two layers contained similar species of fossils have the same time of origin



How stratigraphy works

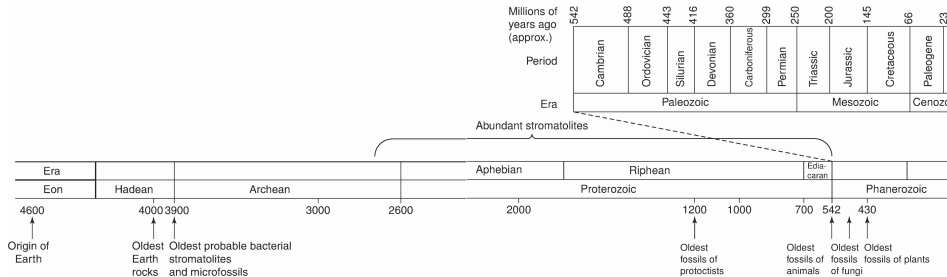


Use of radioactivity

- In 1896, Becquerel discovered **radioactivity**. It was found that some atoms are constantly breaking into smaller ones, sometimes with very slow speed
- Consequently, it is possible to calculate the age of mineral from the concentration of radioactive elements



Geological scale



Age and time. Basic principles

Some basic principles



Principle of actuality

- Charles Lyell (1830)
- “The present is the key to the past”



Occam's razor

- Father William of Ockham (ca. 1300)
- “Plurality must never be posited without necessity”



Science as falsification

- Karl Popper (1963)
- “If something cannot be proved wrong, then it is meaningless”



Summary

- Geological time is calculated on the basis of both relative (stratigraphy) and absolute (radioactivity) methods
- Science is based on the principles of actuality, falsification, Occam's razor, and hypothesis testing



For Further Reading



Biology. Wikipedia.

<http://en.wikipedia.org/wiki/Biology>



History of Life. Wikipedia.

http://en.wikipedia.org/wiki/History_of_life

