Ashur university collage

Dept. of Biology

First-year

General geology

Lec. 3

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The geologic time scale is the fundamental tool geologists use to unravel Earth's history. It allows investigation into the development of life over time, including mass extinctions, repeated continental collisions and mountain-building events, as well as past environmental changes.

Construction of a modern geologic time scale involves three steps:

First, a relative time scale based on stratigraphy, called the chronostratigraphic scale, based on fossil content of the rocks.

Second, based either on radiometric data, or chemical changes in ice cores with depth or reversals in the Earth's magnetic field – this is called the chronometric scale.

The third step is to combine the chronostratigraphic and chronometric scales to produce a calibrated geologic timescale.

The geologic time scale is divided into four major eons, each of which is further divided into smaller intervals:

Hadean Eon: This is the earliest eon, which lasted from about 4.6 billion years ago to about 4 billion years ago. During this time, Earth was still forming, and its surface was molten. There are few rocks from this period that have survived, so it is difficult to study.

Archean Eon: This eon lasted from about 4 billion years ago to about 2.5 billion years ago. During this time, the first single-celled organisms appeared, and the atmosphere became rich in oxygen due to photosynthesis.

Proterozoic Eon: This eon lasted from about 2.5 billion years ago to about 541 million years ago. During this time, complex life forms began to evolve, and the first multicellular organisms appeared.

Phanerozoic Eon: This is the most recent eon, which began about 541 million years ago and continues to the present day. The Phanerozoic eon is divided into three eras:

- **Paleozoic Era**: During this time, life on Earth diversified rapidly, and the first vertebrates, land plants, and insects appeared.

- **Mesozoic Era**: It is sometimes called the "Age of Reptiles" because it was a time when dinosaurs dominated the land, but it was also a time of rapid evolution for mammals, birds, and flowering plants.

- **Cenozoic Era**: This era began about 66 million years ago and continues to the present day. It is sometimes called the "Age of Mammals" because it was a time when mammals diversified and became the dominant land animals. Human beings also evolved during this era.