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# Unveiling Earth's History: A Journey Through The Geological Time Scale

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***Abstract:***
*The Geological Time Scale stands as an invaluable framework, unravelling the Earth's history from its primordial beginnings to the present day. This article probes into the historical evolution of the Geological Time Scale, exploring its foundations in stratigraphy, the basis of divisions, its role in documenting the evolution of life, and its significance in the context of world stratigraphy and global correlation as well as major events and spatiotemporal distribution of mineral resources. This article aims to provide a comprehensive overview of the Geological Time Scale, illustrating its profound impact on our understanding of Earth's dynamic past.*
***Key Word****: Geological Time Scale, Stratigraphy, Correlation, Evolution.*

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## I. Introduction

The Geological Time Scale serves as a testament to humanity's relentless quest to decipher the temporal intricacies of our planet's geological history. From the rudimentary calculations of Archbishop James Ussher to the sophisticated stratigraphic principles of the 21st century, the Geological Time Scale has undergone a transformative journey. This introduction traces the historical roots of the Geological Time Scale highlighting key milestones in its development and the paradigm shifts that have shaped our perception of geological time.

As we venture into the stratigraphic realms, the article explores the fundamental basis of Geological Time Scale divisions, elucidating how geologists meticulously navigate through layers of rock strata and fossils to construct a chronological narrative. The Geological Time Scale, a hierarchical framework of eons, eras, periods, epochs, and ages, is not merely a catalogue of time but a living record of Earth's evolution.

An integral aspect of the Geological Time Scale narrative is the compelling story of life on Earth. The article intricately weaves together the evolution of life with the temporal boundaries defined by the Geological Time Scale, showcasing how the rise and fall of species coincide with the ebb and flow of geological epochs. From the Cambrian explosion to the age of dinosaurs, the Geological Time Scale provides a chronological canvas upon which the drama of life unfolds.

Beyond its paleontological significance, the Geological Time Scale plays a pivotal role in the global stratigraphic community. The establishment of Global Stratotype Sections and Points (GSSPs) serves as anchor points, synchronizing geological events worldwide and facilitating seamless correlation. This interconnectedness, fostered by the Geological Time Scale, transcends regional boundaries, creating a unified language for scientists to decipher Earth's history.

In the ensuing sections, the article will unravel the practical applications of the Geological Time Scale in various Earth sciences, offering insights into climate studies, resource exploration, and beyond. The GTS, a dynamic and evolving entity, continues to be a guiding beacon for scientists navigating the vast expanses of geological time, revealing the secrets of our planet's storied past.

## II. History Of Geological Time Scale And Prominent Milestones

The construction of the Geological Time Scale is a testament to humanity's enduring curiosity about the Earth's past. Over centuries, the development of this chronological framework has witnessed remarkable milestones, shaped by scientific breakthroughs and the collective efforts of geologists worldwide.

1. **Early Attempts and Catastrophism:** The roots of the Geological Time Scale can be traced back to the 17th century, with Archbishop James Ussher's meticulous calculations based on biblical genealogies, dating the creation of the Earth to 4004 BCE. However, it wasn't until the late 18th century that a more systematic approach emerged. Catastrophism, proposed by Georges Cuvier, suggested that Earth's history was punctuated by catastrophic events, leading to distinct layers in the rock record.

2. **Stratigraphy and Uniformitarianism:** The early 19th century witnessed a paradigm shift with the emergence of stratigraphy as a guiding principle. In 1830, Sir Charles Lyell's work on uniformitarianism, advocating for the idea that present geological processes could explain past events, laid the foundation for a more dynamic understanding of Earth's history. This period also saw the identification of distinct rock layers and the recognition that fossils were indicative of specific time periods.
3. **The Birth of the Geological Time Scale:** The mid-19th century marked a crucial period with the establishment of the Geological Time Scale's foundational elements. Sir Roderick Murchison and Sir Charles Lyell, building upon the work of others, introduced the concept of primary divisions such as Paleozoic, Mesozoic, and Cenozoic. These divisions were based on fossil assemblages and significant geological events, providing a coarse yet groundbreaking framework.
4. **Radiometric Dating and Absolute Time:** The early 20th century witnessed a monumental breakthrough with the advent of radiometric dating techniques. The discovery of radioactivity by Henri Becquerel and the subsequent work of scientists like Marie and Pierre Curie and Ernest Rutherford paved the way for determining the absolute ages of rocks. With the development of radiocarbon dating in the mid-20th century, geologists gained unprecedented precision in dating events.
5. **Global Stratotype Sections and Points (GSSPs):** The latter half of the 20th century saw the establishment of Global Stratotype Sections and Points (GSSPs), commonly known as "golden spikes." These internationally agreed-upon reference points serve as markers for the beginning of defined geological time units. The GSSPs anchor the Geological Time Scale to specific geological events, fostering global correlation and collaboration.
6. **The Anthropocene Debate:** The 21st century brings new challenges and debates, particularly with the proposition of a new epoch—the Anthropocene. This proposed epoch reflects the significant impact of human activities on Earth's geology and ecosystems. The Anthropocene debate underscores the Geological Time Scale's role in not just documenting natural events but also navigating the complexities of our current era.

## III. Contribution Of Pioneer Researchers In The History Of Geological Time Scale

The contributions of Nicolaus Steno, Arthur Holmes, and other researchers have been instrumental in shaping the Geological Time Scale. From establishing fundamental principles of stratigraphy to introducing quantitative methods for dating geological events, these scientists have left an indelible mark on the understanding of Earth's temporal evolution.

### Nicolaus Steno: Pioneer of Stratigraphy

Nicolaus Steno, a Danish scientist of the 17th century, played a pioneering role in the development of stratigraphy and laid the groundwork for understanding the principles that underpin the Geological Time Scale.

1. **Law of Superposition:** Steno formulated the Law of Superposition, a fundamental principle in stratigraphy stating that in a sequence of undisturbed rock layers, the youngest rocks are at the top, and the oldest are at the bottom. This principle became a cornerstone for deciphering the chronological order of geological formations.
2. **Principle of Original Horizontality:** Steno also proposed the Principle of Original Horizontality, suggesting that sedimentary rocks are deposited in horizontal layers. Any deviation from this horizontal arrangement, he argued, would indicate geological disturbance or change over time.
3. **Fossil Succession:** Steno recognized the significance of fossils in correlating rock layers. He observed that fossils succeed one another in a definite and recognizable order, allowing for the relative dating of rocks based on the fossil assemblages they contain.

Steno's contributions laid the groundwork for the later development of the Geological Time Scale, providing the conceptual framework that subsequent researchers would build upon.

### Arthur Holmes: Architect of Geochronology

Arthur Holmes, a 20th-century British geologist, made pioneering contributions to geochronology and radiometric dating, fundamentally altering our understanding of the Earth's age and the calibration of the Geological Time Scale.

1. **Radiometric Dating:** Holmes proposed the concept of radiometric dating, suggesting that the Earth's age could be determined by measuring the decay of radioactive isotopes within rocks. This groundbreaking idea laid the foundation for absolute dating techniques, enabling scientists to assign numerical ages to geological events.
2. **Age of the Earth:** Holmes was instrumental in estimating the age of the Earth using radiometric dating. His calculations provided a far more expansive timeline than previously thought, challenging conventional views and pushing back the age of the Earth to approximately 4.5 billion years.

3. **Concept of Convection Currents:** Holmes also made contributions to the understanding of Earth's internal processes. He proposed the concept of mantle convection currents, which contributed to the development of plate tectonics—an essential aspect of the Geological Time Scale.

Holmes' work not only refined the chronology of Earth's history but also introduced a quantitative dimension to the Geological Time Scale, revolutionizing the field of geology.

**Other Researchers and Collaborators:**

1. **Charles Lyell:** Charles Lyell, a 19th-century Scottish geologist, significantly influenced the concept of uniformitarianism. His work, particularly in "Principles of Geology," emphasized the idea that present geological processes are the key to understanding the past. This principle provided a philosophical foundation for interpreting Earth's history within the context of the Geological Time Scale.
2. **Alfred Wegener:** Although primarily known for his contributions to the theory of continental drift, Alfred Wegener's ideas had significant implications for understanding Earth's history. The recognition of past continental configurations and movements contributed to the refinement of the Geological Time Scale.
3. **Richard Cowen:** In the latter half of the 20th century, Richard Cowen made noteworthy contributions to refining the Geological Time Scale. His work on biostratigraphy and correlation of marine microfossils provided valuable insights into the chronological arrangement of geological events.

## IV. Timeline Of History Of Geological Time Scale

Constructing a timeline of the history of the Geological Time Scale involves highlighting key events and milestones that have shaped our understanding of Earth's history. Timeline provides a snapshot of the key developments in the history of the Geological Time Scale, from its early conceptualization to contemporary debates and refinements. The field continues to evolve as new technologies and interdisciplinary approaches contribute to a deeper understanding of Earth's temporal history. The timeline, focusing on significant developments in the history of the Geological Time Scale, is as follows:

- **1669:** Nicolaus Steno formulates the Law of Superposition, a fundamental principle in stratigraphy. Steno also proposes the Principle of Original Horizontality, emphasizing the horizontal deposition of sedimentary rocks.
- **1795:** James Hutton introduces the concept of uniformitarianism, suggesting that present geological processes can explain past events
- **1815-1820:** William Smith creates the first geological map and recognizes the principle of faunal succession, contributing to the idea of stratigraphy.
- **1830:** Charles Lyell's "Principles of Geology" popularizes uniformitarianism and emphasizes the importance of understanding Earth's history through observable, natural processes.
- **1913:** Arthur Holmes proposes the concept of radiometric dating, revolutionizing the measurement of geological time.
- **1920s-1930s:** Alfred Wegener introduces the theory of continental drift, which eventually contributes to the development of plate tectonics.
- **1940s-1950s:** Radiocarbon dating and other radiometric dating techniques are refined, providing more accurate methods for dating geological events.
- **1960s:** The theory of plate tectonics gains widespread acceptance, fundamentally changing the understanding of Earth's structure and history.
- **1961:** Felix Gradstein proposes the Global Standard Stratigraphic Scale (GSSP), a system to correlate rocks globally.
- **1970s:** Advances in technology, including computerized tomography (CT) scans, improve the understanding of subsurface geology.
- **1974:** The Anthropocene Working Group is established to explore the potential formalization of the Anthropocene epoch within the Geological Time Scale.
- **1980s:** High-resolution biostratigraphy and sequence stratigraphy become integral to refining the Geological Time Scale.
- **1990s:** Global Stratotype Sections and Points (GSSPs) become more widely adopted as reference points for defining boundaries within the Geological Time Scale.
- **2000s:** Advances in technology, including satellite imagery and high-precision dating methods, contribute to a more detailed and accurate Geological Time Scale.
- **2010s:** The Anthropocene Working Group continues to debate the formal recognition of the Anthropocene epoch within the Geological Time Scale.
- **2018:** The International Union of Geological Sciences (IUGS) establishes the Meghalayan Age as a new subdivision within the Holocene epoch, based on changes in climate and environment.

## V. Divisions Of Geological Time Scale

The Geological Time Scale is a chronological framework that divides Earth's history into various units based on significant geological and paleontological events. The nomenclature of divisions within the Geological Time Scale follows a hierarchical structure, with each level representing a different span of time. The primary divisions, from largest to smallest, are eons, eras, periods, epochs, and ages. The nomenclature is standardized by international bodies like the International Commission on Stratigraphy (ICS) and the International Union of Geological Sciences (IUGS). The establishment of Global Stratotype Sections and Points (GSSPs) at specific boundaries ensures uniformity in the definition of these divisions, facilitating global correlation and communication among geologists. Here's a detailed explanation of the nomenclature of these divisions:

1. **Eons:** Eons are the largest and most inclusive units of geological time. They represent the longest intervals of Earth's history, encompassing billions of years. The two main eons are the Precambrian and the Phanerozoic.

The Precambrian Eon includes everything before the Cambrian Period, spanning from the formation of the Earth approximately 4.6 billion years ago to about 541 million years ago. The Phanerozoic Eon includes the time from the Cambrian Period to the present day.

2. **Eras:** Eras are the second-largest units and are subdivisions of eons. They represent significant intervals marked by distinct geological events.The Phanerozoic Eon is divided into three eras. The Paleozoic Era (541 to 252 million years ago): Characterized by the emergence of complex multicellular life forms, including the first vertebrates and plants. The Mesozoic Era (252 to 66 million years ago): Known as the age of reptiles, marked by the dominance of dinosaurs and the eventual rise of mammals and flowering plants. The Cenozoic Era (66 million years ago to the present): Characterized by the rise of mammals, birds, and the development of Homo sapiens.
3. **Periods:** These are subdivisions of eras and represent intervals marked by distinctive rock layers and characteristic fossil assemblages.For example, the Paleozoic Era is divided into the Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Permian periods.
4. **Epochs:** Epochs are subdivisions of periods and represent shorter intervals with distinct environmental and biological characteristics.

- **Nomenclature:** Each period is divided into epochs. For example, the Paleogene Period of the Cenozoic Era includes the Paleocene, Eocene, and Oligocene epochs.

5. **Ages:** They are the smallest units of the Geological Time Scale, representing even shorter intervals defined by specific events or fossil evidence. For example, the Holocene Epoch of the Quaternary Period includes the Greenlandian, Northgrippian, and Meghalayan ages.

The names of the divisions in the Geological Time Scale are derived from Greek and Latin roots, reflecting the characteristics and events associated with each period of Earth's history. Here's an explanation of the basis for the names of the mentioned divisions:

1. **Hadean Eon:** The term "Hadean" is derived from Hades, the underworld in Greek mythology. This eon represents the earliest phase of Earth's history, characterized by intense heat and geological activity. The Hadean Eon extends from the formation of the Earth (approximately 4.6 billion years ago) to the formation of the first rocks (around 4 billion years ago).
2. **Archaeozoic Eon:** "Archaeo" means ancient in Greek, and "zoic" refers to life. The Archaeozoic Eon spans from the formation of the Earth to the beginning of visible life forms. It represents a time when Earth's surface was undergoing significant geological processes, leading to the eventual emergence of life.
3. **Proterozoic Eon:** "Protero" means earlier or former in Greek. The Proterozoic Eon follows the Archaeozoic and extends from approximately 2.5 billion to 541 million years ago. It is marked by the appearance of eukaryotic cells and the development of multicellular life forms.
4. **Azoic Eon:** "Azoic" means without life in Greek. The Azoic Eon is a historical term that is no longer in use. It was once believed to represent a time without life, but subsequent research revealed evidence of life during this period. The Azoic Eon is now obsolete, and the Proterozoic Eon has replaced it.
5. **Paleozoic Era:** "Paleo" means ancient in Greek. The Paleozoic Era spans from 541 to 252 million years ago and is characterized by the emergence of complex multicellular life forms. It includes significant events such as the Cambrian Explosion, the colonization of land by plants and animals, and the formation of vast coal deposits.
6. **Mesozoic Era:** "Meso" means middle in Greek. The Mesozoic Era extends from 252 to 66 million years ago. It is often referred to as the Age of Reptiles and includes the Jurassic and Cretaceous periods, during which dinosaurs thrived and diversified. The end of the Mesozoic Era is marked by the mass extinction event that led to the demise of the dinosaurs.
7. **Cenozoic Era:** "Ceno" means recent in Greek. The Cenozoic Era spans from 66 million years ago to the present day. It is often referred to as the Age of Mammals and includes the Paleogene and Neogene periods.

**Geological Time Scale**

| Eon | Era | Period | Epoch | Type Area | Pioneer Workers | Indian Stratigraphy | Palaeogeography | Major Orogenic Events | Palaeoclimate | Flora And Fauna | Major World Deposits | Major Indian Deposits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phanerozoic | Cenozoic | Quaternary | PRESENT Holocene 0.01 MA | France | Lahmen and Ardino (1768) | Sutlej-Ganga-Brahmaputra Plains, Kashmir Valley | Extensive Glacial Lakes Were Formed; Advances of Ice In Latitudes of Northern Hemisphere | Alpine Mountains of Europe, Alpine Orogeny | 5th Ice Age Cenozoic Ice Age (2.58 MY- Today) | Hominids Flourished; Sabre-toothed Cats, Woolly Mammoths Were Abundant; Age of Gigantism (Giant Beaver,sloth); Decidous,Conifers,Grasses on Land | Bauxite:- Guianas,Brazil (South America) | Bauxite :- Deccan Trap (M.P. & Maharashtra), Coastal Deposits of EGMB |
| | | 2.6 MA | Pliestocene | | | | | | | | | |
| | | Tertiary | Pliocene 5.3 MA | Italy | | Tertiary of Assam, Indo-Gangetic Plains, Upper Shiwalik,Thar Desert, | Joining of North America and South America Took Place | Himalayan Orogeny (58-61 Ma) | Period Of Cooling | First Hominids Appeared; Fish,Birds Branched Out | Bauxite:- Hungary, Yugoslavia, USA<br>Gold Lodes:- Arizona, Nevada, California(USA)<br>Silver:- Utah, Nevada(USA) | Coal (Lignite) :- Rajasthan, Neyveli (Tamil Nadu)<br>Petroleum:- Digboi,Moran,Ankaleshwar |
| | | | Miocene 23 MA | | | | Junction of Africa And Eurasia Occurred | | | Horses,Camels And Rhinos Appeared | | |
| | | | Oligocene 33 MA | | | | Tethys Restricted Due to Uplift of Himalayas | | | Dogs, Cats And Pigs Appeared | | |
| | | | Eocene 55 MA | | | Deccan Volcanism ended in Eocene | India Collided with Asia; Greenland Separated From North America | | | Eohippus- First Horse Appeared: Whales,Elephant Ancestors, Bats Appeared | | |
| | | 65 MA | Palaeocene | | | | Australia, Antartica Drifted to New Position | | Warm Climate<br>Extensive Deccan flows | Marked Presence of Rodents, Dinosaurs Died Out; Whole of The Cenozoic "Age of Mammals" | | |
| | Mesozoic | Cretaceous 150 MA | | Cliff of Chalk, Near Dover (England),London and Paris Basin | D. Halby (1822) | Cretaceous of Tiruchirappalli, Infratrapian Trap, Intrapian, Bagh and Lameta Beds | Antartica - Australia Brokeup | Nevadan Orogeny (North America) (155-145 Ma) | | Period of Sea Serpents, Dinosaurs Died Out, First Flowering; Plant Appeared; First Snake Appeared | Bauxite:- France, Greece<br>Coal deposits of South America, and Western Canada | Coal fields of Ghuneri,Kutch |
| | | Jurassic 200 MA | | Jura Mountains, Border between France and Switzerland | Von Humboldt (1822) | Jurassic of Kutch | Separation of Laurasia And Gondwana Land Began | | | First Primitive Mammal appeared; Primitive Reptiles Included Flying Types; Age of Dinosaurs (Herbivores As Well As Carnivores); First Bird Appeared (Archeotryx) | Coal deposits of Siberia | Iron :- Ironstone-Rajmahal Trap (Bihar)<br>Coal field of Maharashtra, Satpura region(M.P.) |
| | 260 MA | Triassic | | Three fold nature of Rocks, In Central Germany | Von Alberti (1834) | Triassic of Spiti, Upper Gondwana | Breakup of North America and Gondwana Land Started | | Warm and Arid (No Coal) | Plants Included Tree Ferns,Spores,Rushes,Conifers;<br>New Invertebrates Included Corals,Snails, Clams, Lobstars, Common Shell Fish Ammonites, Belemnites, Reptiles Included First Dinosaurs | Coal deposits of China, South America | Iron :- Haematite and Limonite, Udhampur (J&K) |
| | Palaeozoic | Permian 300 MA | | Perm Basin, Russia | Murchison (1841) | Gondwana Sequence | Gondwana Land and Ancestral North America Joined Together | Appalachian (325-260 Ma)<br>Alleghanian, Antler, Hercynian Orogeny, Uralian Orogeny (323-251 Ma) | 4th Ice Age, Karoo Ice Age (360-260 MY); Glacial Deposits Occur within 60° of South Palaeopoles | Reptiles Became to Flourish | Coal :- North Antelope (USA), Haerwusu Coal Mine (China), Heidaigou Coal Mine (China), Peak dowas (Australia), Moatize Coal Mine (Mozambique) | Coal :- Jharia, Bokaro, Raniganj, Godavari Valley<br>Iron :- Ironstone-Shale (Raniganj Coal Field) |
| | | Carboniferous 360 MA | | Coal from New Castle,Near London in England | William Conybear and William Phillips (1822) | | | | (Boulder Bed), Warm and humid at the end<br>Cooling in the Vicinity of south Palaeopoles | Non Flowering Plants, Larger Invertebrates 'Crenoids' Were Abundant; Swarms With Trees, Ferns Filled; First Reptile Appeared, Insects Were Giant | Platinum:- Ural Mountains, Dunitic Rock (New Zealand) | |
| | | Devonian 420 MA | | City in England, 'Devonshire' | William Lansdale with Sedgewick and Murchison | Muthquartzite, Lipak Series (Spiti) | Joining of Ancestral Europe And Ancestral North America | Acadian Orogeny, Canada (375-325 Ma) | Warm to Moderate; Glacial Deposits In South America, 40° of South Palaeopoles | Age of Fishes, Land Forest And Amphibians Appeared | Low grade Bauxite- Russia | Rock salt deposits, Gypsum deposits of Pakistan |
| | | Silurian 440 MA | | Name of a Tribe from England 'Sillurs' | Murchison (1879) | Zanskar Valley,Takche Formation, Spiti | Deformation Resulted In Upliftment of Basons In Appalachian, Caledonian and Uralian Regions | Caledonian Orogeny (490-390 Ma) | Warm and Arid Climate; Evidences:- Rock salt, Gypsum, Cap Rock of Niagra falls | First Land Plant And Coral Reef Appeared, Trilobites,Cephalapods, Snails Were Abundant; Land Animals Appeared First time i.e. Spider, Scorpion, Milipeds | Cu-Mo-Au Deposit :- Bainaimia (North China Craton) | |
| | | Ordovician 480 MA | | Name of a Tribe from England 'Ordivicaes' | Charles Laporworth (1879) | Thango Valley Formation,Spiti | Seas Covered More Than 50% Area of Continents | | 3rd Ice Age Andean-Saharan Ice Age (460-420 MY); Generally Warm Climate | First Fish (Vertebrates) Appeared; Graptolites , Gastropods, Cephalapods Were Abundant | | |
| 570 MA | | Cambrian | | Old Roman Name, Province in England | Adam Sedgewick (1821) | Salt Range(Pakistan), Kashmir | Ancestral Continents Separated From Each Other by Deep Ocean | | Cool; Later Warmed up | Fossils With Calcareous or Siliceous Skeleton; First Shelled Invertebrates, Paradoxides Appeared ; Trilobites Existed; Calymene Also Found | | |
| Azoic | Proterozoic | Neoproterozoic 1000 MA | | | | BIFs, Chhattisgarh Supergroup,Vindhyan, Cudappah, Delhi, Aravalli, Gwalior, Indravati Group | Five Separated Continents Existed;<br>-Long Elongated Basins (Geosynclines) Formed on the Margins of Continents<br>(Ref:- Physical Geology by Sheldon Judson) | Pan-African Orogeny (550 Ma),<br>Greenville Orogeny (1250-980 Ma) | 2nd Ice Age Cryogenian Ice Age (850-630 Ma); | Stromatolites ; Marine Organisms Like Worms Existed | Lead-Zinc :- Mississippi Valley type deposit of Carbonate hosted Rock<br>Evaporite Deposit :- Dashiqiao (Magnetite Deposit)(China) | Lead-Zinc :- Zawar(Rajasthan)<br>Evaporite Deposit:- Magampeta Barite Deposit, Saline Series (Pakistan Sindh) |
| | | Mesoproterozoic 1600 MA | | | | | | | | | Chromite :- Great Dyke (Zimbabwe), Bushveld (South Africa)<br>Nickel :- Sudbury Nickel (Canada)<br>Lead-Zinc :- Broken Hill (Australia), Mount Isa (Australia)<br>Tin-Tungsten:- Bushveld (South Africa) | Sukinda Chromite Deposit,<br>Gangpur (Orissa) (Fe-Mn Deposit),<br>Copper:- Malanjkhand, Khetri<br>Lead-Zinc:- Agucha-Rajpura-Dariba (Rajasthan), Sargipali Mines (Andhra Pradesh)<br>Tin-Tungsten:- In Pegmatites, Bastar Craton |
| | 2500 MA | Palaeoproterozoic | | | | | | | | | Iron :- Algoma Type BIF (Canada), Pilbara (Australia)<br>Gold-Tungsten :- Zimbabwe Archean Craton | Iron :- Bababudan, Sandu, Kudremukh, Dalli Rajhara, Bailadila |
| | Archeaozoic | Archean 4060 MA | | | | Bundelkhand Singhbhum, Bastar Craton, Dharwar Supergroup | | Aravalli-Delhi Orogeny, Dharwar, Eastern Ghat, Vindhyan<br>Algoman Orogeny Canada (2760-2500 Ma) | 1st Ice Age Huronian Ice Age (2400-2100 Ma); Warm Climate | Seas were Occupied By Bacterial And Algae like Organisms; Stromatolites Dates Maximum 3000 MY; Archean of Minnecota Shows Presence of Petroleum Like Substance (2700 MY) | PGE :- In Layered Intrusions, Bushveld (South Africa), Stillwater (USA)<br>Gold+Uranium:- Witswatersrand (South Africa)<br>Gold:- Barberton Greenstone Belt (South Africa) | Gold:- KGF (Karnataka)<br>Iron:- Singhbhum (Jharkhand), BMQ (South India) |
| 4600 MA | | Hadean | | | | | | | | | | |

Table. No. 1 Geological Time Scale

The Cenozoic is marked by the diversification and dominance of mammals, including the evolution of hominids and the rise of Homo sapiens.

These names not only reflect the chronological sequence of geological time but also capture the major geological and biological events that define each division in Earth's history.

## VI. Discussion And Conclusion: -

An attempt is made to combine and correlate the different events of the history of the Earth's life, paleogeographic status, evolution of life, paleoclimatic changes, Indian stratigraphic formations, important Indian and world deposits. From the Table No. 1, it is evident that the geological events in the history of the Earth are rationally interdependent. It is worthwhile to mention that many admirable attempts have been made to explain the geological history under various aspects like paleogeography, paleoclimate, evolution of life, orogenic events etc. Keeping all those great works in mind, this narration is a humble submission of putting all the eggs in one basket envisaging that all these happenings would rationally be correlated and understood by the students of Earth Sciences and knowledge seekers.

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