Dinosaurs and UNESCO Global Geoparks Tag

For Prelims: Geological Survey of India, UNESCO Global Geoparks, Cretaceous period, Mongolian Gobi Desert, Geo Heritage Sites, Landforms, Mountain Ranges, Glacial Features, Mesozoic Era, Pangaea, Yucatan Peninsula.

For Mains: India's geo heritage sites and UNESCO Global Geoparks tag.

Source: IE

Why in News?

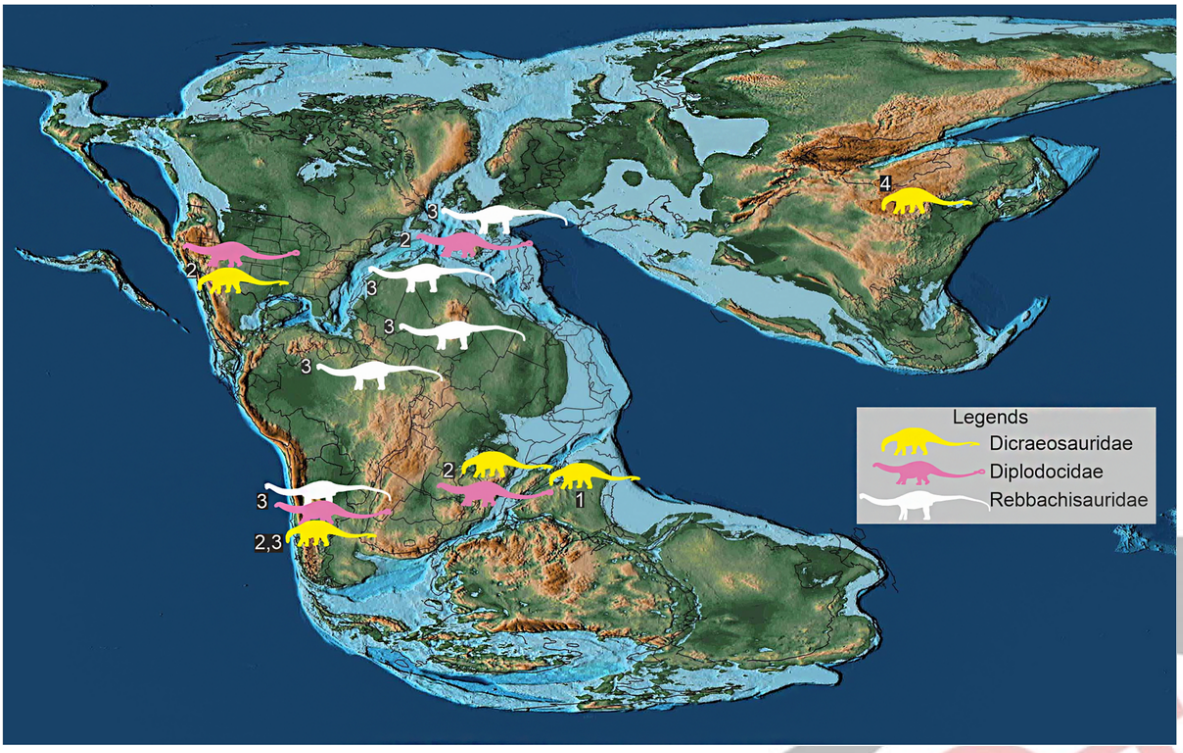
The **Geological Survey of India** wants **Dinosaur Fossil Park and Museum** in Raiyoli village in Gujarat to get a **UNESCO Global Geoparks tag.**

What are the Key Points About Gujarat's Dinosaur Fossil Park and Museum?

- **Geological Importance:** In the **early 1980s,** geologists discovered large **dinosaur bones and fossilised eggs.**
  - The bones belong to the ***Rajasaurus Narmadensis*** and ***Rahiolisaurus Gujaratensis***, **carnivorous** dinosaurs from the **Late Cretaceous period (~67 million years ago).**
- **Global Position:** It is one of the largest **dinosaur egg hatcheries** in the world, ranking third globally after **Aix-en-Provence (France)** and the **Mongolian Gobi Desert.**
- **International Interest:** The site gained international attention in the **1990s** when a team of **50 palaeontologists**, visited to study the dinosaur eggs.

What is the History of Dinosaurs in India?

- **Early Dinosaur Discoveries: Asia's first** dinosaur bones were discovered in India in **1828 in Jabalpur, Madhya Pradesh**, by Captain **William Henry Sleeman** which were later named ***Titanosaurus indicus* in 1877**.
  - ***Titanosaurus***, a large **herbivorous** dinosaur that lived during the **Late Cretaceous period.**
- **Dinosaur Fossils: Madhya Pradesh, Maharashtra, and Gujarat**, are key fossil-rich regions that have yielded many dinosaur skeletons and eggs.
  - Several important species have been discovered in this region are ***Barapasaurus*** (herbivorous), ***Isisaurus*** (herbivorous), ***Indosuchus*** (carnivorous), and ***Rajasaurus Narmadensis*** (carnivorous).
- **Dinosaur Hatcheries:** India is believed to be one of the largest **dinosaur hatcheries** in the world, with major nesting sites discovered in regions like **Jabalpur (MP)**, **Balasinor (GJ)**, and **Dhar District (MP)**.



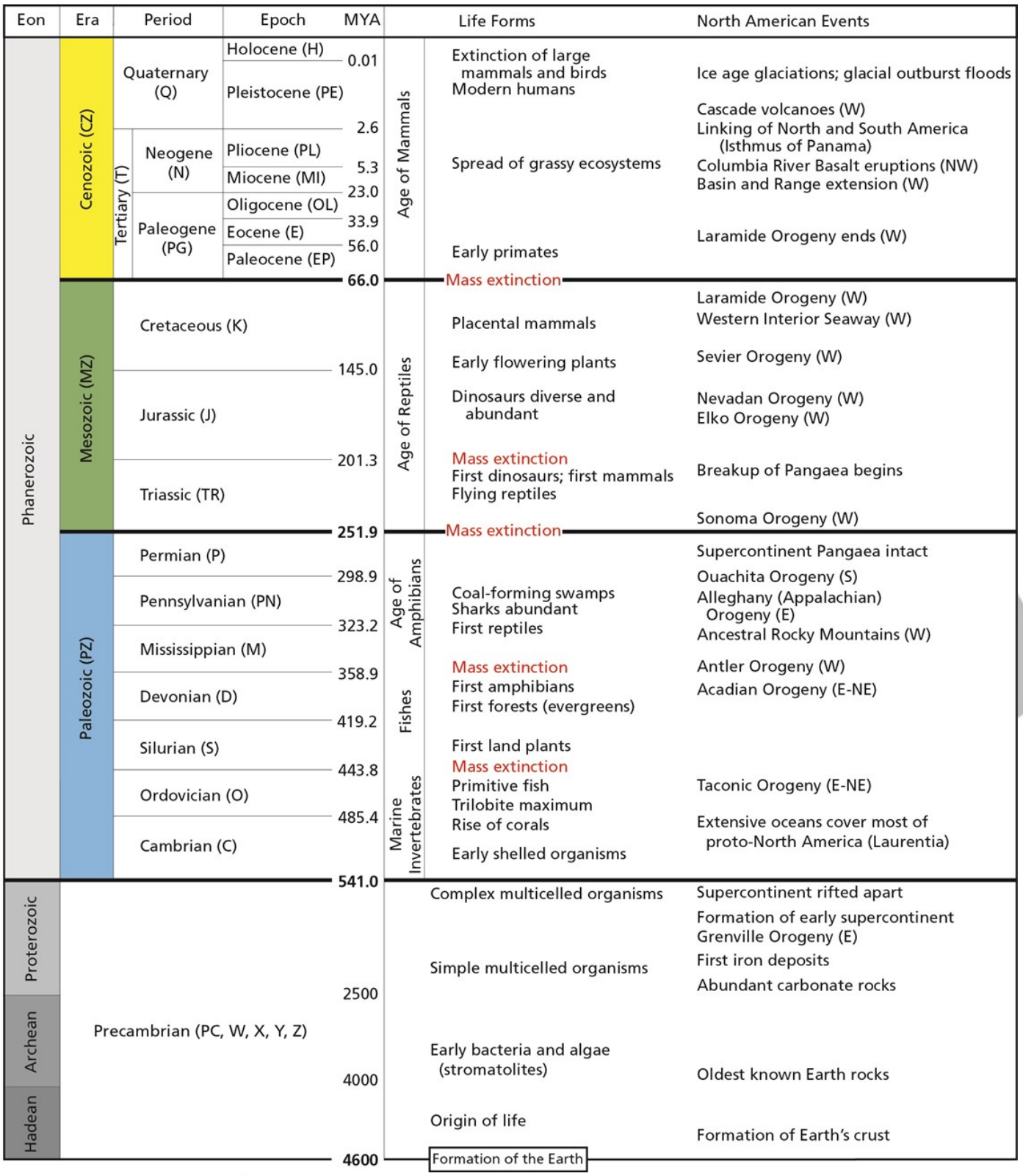
What are UNESCO Global Geoparks (Geo Heritage Sites)?

- **About:** UNESCO Global Geoparks are **unified geographical areas** with internationally significant **geological sites**, managed with a holistic approach to protection, education, and sustainable development.
    - **Geo Heritage Sites** are locations that have geological significance due to their **unique rock formations, fossils, mineral deposits, or landforms**.
- **Designation Process**: UNESCO Global Geoparks are designated for **four years**, after which they undergo **revalidation**.
    - **Green Card**: Awarded if the area **continues to meet** the criteria.
    - **Yellow Card**: Issued if the area **no longer meets the criteria**, allowing two years for improvement.
    - **Red Card**: Issued if the area **fails to meet** the criteria within two years after a yellow card, leading to loss of status.
- **Global Presence**: As of now, there are a total of **213 UNESCO Global Geoparks across 48 countries** but **India has no** Global Geoparks. E.g., **Dali-Cangshan UNESCO Global Geopark in China.**
- **Diversity:** Geo heritage sites can include **volcanic formations, fossil-rich areas, caves, mountain ranges, glacial features**, and mineral-rich regions.

What are Key Facts About Dinosaurs?

- **About:** Dinosaurs are prehistoric reptiles that have lived on Earth from **about 245 million years ago** to the present.
    - **Modern birds** are considered a type of **dinosaur** due to sharing a common ancestor with **non-avian dinosaurs**.
- **Size:** Some dinosaurs were **massive**, such as ***Argentinosaurus***, weighing up to **110 tons.**
    - The **smallest** were tiny species, such as the **bee hummingbird**, which is still a **bird descendant** of dinosaurs.
- **Classification:** Dinosaurs are classified into **three major groups.**
    - **Ornithischia**: Beaked **plant-eaters**, including Stegosaurus and Triceratops.
    - **Sauropodomorpha**: Long-necked, **large-bodied herbivores** like Diplodocus.
    - **Theropoda**: **Carnivorous dinosaurs** like *Tyrannosaurus rex* and *Velociraptor*, including the ancestors of modern birds.
- **Period:** Most dinosaurs lived during the **Mesozoic Era (245 to 66 million years ago)**, which is

divided into **three periods.**
    - **Triassic (252-201 million years ago)**: Reptiles evolved into dinosaurs on the supercontinent **Pangaea**.
    - **Jurassic (201-145 million years ago)**: Earth cooled, leading to **more plants and dinosaurs,** including *Brachiosaurus*.
    - **Cretaceous (145-66 million years ago)**: More continents formed, and **dinosaur diversity increased,** including the ***Tyrannosaurus Rex* and *Velociraptor***.
- **Diet and Movement**: **Meat-eaters** walked on **two legs** and hunted alone or in groups whereas **plant-eaters** walked on **two or four legs** and grazed on plants.
- **Distinctive Feature**: The key feature that distinguishes dinosaurs from other reptiles is a **hole in the hip socket**, allowing them to **walk upright**.
    - ***Pterosaurs*** (flying reptiles) and ***plesiosaurs*** (ocean-dwelling reptiles) do not have the hip socket feature and are **not classified as dinosaurs.**
- **Extinction**: Dinosaurs went extinct **around 66 million years ago** after a massive asteroid impact during the ***Cretaceous period* (145 million to 66 million years ago)**.
    - The asteroid collision with Earth created an **impact crater over 110 miles (180 km)** wide in the **Yucatan Peninsula**, now located in **Mexico.**



Conclusion

Gujarat's Dinosaur Fossil Park, a globally significant site, showcases crucial **dinosaur fossils and eggs,** highlighting India's rich **paleontological heritage**. With international interest, it holds potential for **UNESCO Global Geopark designation**, contributing to geo-tourism and local development, while preserving Earth's geological and cultural history.

Drishti Mains Question:

Evaluate the geological and paleontological importance of the dinosaur fossil found in India and its

potential impact on geo-tourism.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. The term “sixth mass extinction/sixth extinction” is often mentioned in the news in the context of the discussion of (2018)

(a) Widespread monoculture practices in agriculture and large-scale commercial farming with indiscriminate use of chemicals in many parts of the world that may result in the loss of good native ecosystems.

(b) Fears of a possible collision of a meteorite with the Earth in the near future in the manner it

happened 65 million years ago that caused the mass extinction of many species including those of dinosaurs.

(c) Large scale cultivation of genetically modified crops in many parts of the world and promoting their cultivation in other parts of the world which may cause the disappearance of good native crop plants and the loss of food biodiversity.

(d) Mankind’s over-exploitation/misuse of natural resources, fragmentation/loss of natural habitats, destruction of ecosystems, pollution and global climate change.

Ans: (d)

Q. From the point of view of the evolution of living organisms, which one of the following is the correct sequence of evolution? (2010)

(a) Otter – Tortoise – Shark

(b) Shark – Tortoise – Otter

(c) Tortoise – Shark – Otter

(d) Shark – Otter – Tortoise

Ans: (b)