Prelim Bits 07-09-2019

Avalanche on Mars

- NASA's 'Mars Reconnaissance Orbiter' (**MRO**) captured dust cloud from an avalanche of ice blocks on North Pole of Mars.
- The photo of the avalanche was captured by onboard 'High Resolution Imaging Science Experiment' (**HiRISE**) camera.
- According to NASA, every spring the sun shines on the side of North Pole of Mars known as the north polar layered deposits.
- This warmth destabilises the ice blocks, break loose which causes Avalanche.
- Avalanches can also be caused by a number of things on Mars surface.

1. In June 2018, NASA's orbiter was able to spot an avalanche, caused by a meteoroid impact on Mars.
2. The meteoroid crashed on a slope, it destabilized it and caused an avalanche of dirt and dust.

Mars Reconnaissance Orbiter (MRO)

- **MRO** is a multipurpose spacecraft of NASA designed to conduct reconnaissance and exploration of Mars from orbit.
- Launched in 2005, it carried instruments for studying the atmosphere of Mars and to search for signs of water on planet.
- The scientific goals of MRO, according to NASA, are

1. Search for evidence of past or present life in Mars.
2. Understand the climate and volatile history of Mars.
3. To Characterize the geology of Mars.

- To accomplish these goals, MRO carries multiple instruments and it has 3 cameras,

1. High Resolution Imaging Science Experiment (**HiRISE**)
2. Context Camera (**CTX**)
3. Mars Color Imager (**MARCI**)

- MRO has also has,

1. A spectrometer called 'Compact Reconnaissance Imaging Spectrometer for Mars' (**CRISM**),

2. A radiometer called the ‘Mars Climate Sounder’ (**MCS**), and
3. A radar instrument called ‘Shallow Radar’ (**SHARAD**).

Indo-European language origins

- Largest-ever study of ancient human DNA illuminates the Indo-European language origins.
- It indicated that Indo-European languages, arrived in Europe via the steppes.

1. Indo-European languages are the world’s biggest language group.
2. It includes Hindi-Urdu, Farsi, Russian, English, French, Gaelic and more than 400 other languages.

- It suggests that the mass migration of Bronze Age herders from Eurasian Steppes, starting 5,000 years ago, westward to Europe and east to Asia.
- Despite being spread over a vast area encompassing myriad cultures, these languages share uncanny similarities.

1. Similarities in syntax, numbers, basic adjectives and numerous nouns.

- The study also found that the present-day speakers of both these groups descend from a subgroup of steppe herders.
- They moved west toward Europe 5,000 years ago, then spread back east to Central and South Asia in the following 1,500 years.
- It also found that,

1. South Asians who today speak Dravidian languages (mainly in southern India and southwestern Pakistan) had very little steppe DNA.
2. While those who speak Indo-European languages like Hindi, Punjabi, Bengali have far more.

- As far as agriculture is concerned, prior work has found that farming spread to Europe via people of Anatolian ancestry.
- The study also points out that these steppe land herders have left their genetic mark on most Europeans living today.

Harappan Civilization DNA Study

- A new DNA study finds 2500 BC ‘Rakhigarhi’ skeletons have no traces of ‘Aryan gene’.
- Study examined DNA of skeletons found in Rakhigarhi, an Indus Valley Civilisation site in Haryana.
- It found that there is no traces of R1a1 or Central Asian ‘steppe’, gene.
- The population has no detectable ancestry from Steppe pastoralists or from Anatolian (modern day Turkey) and Iranian farmers.
- It suggests that farming in South Asia arose from local foragers rather than

from large-scale migration from the West,

- The Central Asian ‘steppe’ gene is found in much of the Indian population today.
- These DNA in Rakhigarhi had little of any Steppe pastoralist-derived ancestry.
- It shows that it was not ubiquitous in north-west South Asia during the IVC as it is today
- The paper indicates that there was no Aryan invasion and no Aryan migration,
    - All the developments from the hunting-gathering to modern times in South Asia were done by indigenous people.
- The paper concludes Indians came from a genetic pool predominantly belonging to an indigenous ancient civilisation.

Source: PIB, The Indian Express