

Topic- aDNA Application

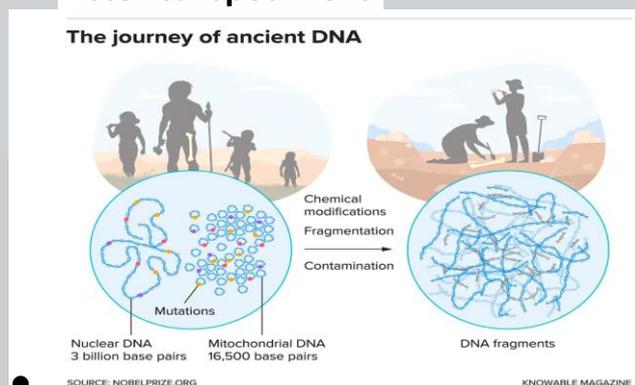
Scientists are using whole-genome sequencing data from fragmented or degraded DNA to understand chromosomal abnormalities.

These approaches are now used to study chromosomal abnormalities in aDNA as well

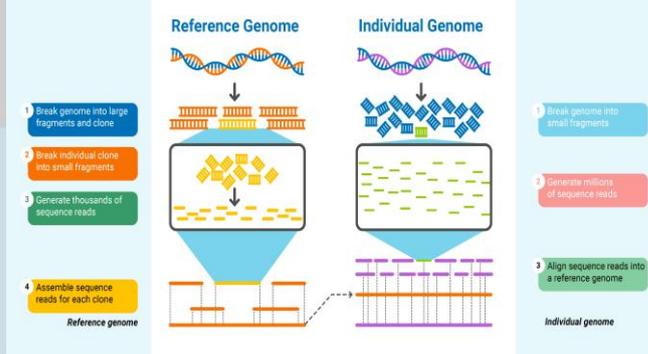
- There is some evidence that ancient humans extensively used birch pitch to repair tools.
- Microbes from the pitch sample can reveal information about the oral health of the individuals who chewed it Sequencing was used to determine the origin of tools found in the 1930s at a site where humans, neanderthals, and denisovans coexisted.
- Archaeologists re-excavated the cave recently and found bone remains.
- Genetic material unequivocally pointed to Homo sapiens and they were dated to be 45,000 years old.

What is aDNA (Ancient DNA)

- Ancient DNA (aDNA) is that recovered from any post-mortem material such as archaeological or historical specimens.



WHOLE GENOME SEQUENCING

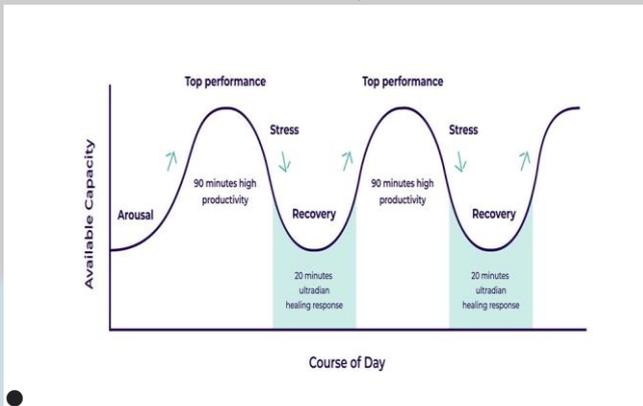


What else can ancestral DNA reveal?

- Studies of aDNA could also provide big clues about the creation and development of stone tools.
- In the 1930s, for instance, researchers dug a cave in Ranis, Germany, where they identified a number of ancient stone tools.
- The Hindu

Ultradian rhythm

- Ultradian rhythm is a recurrent period or cycle repeated throughout a 24-hour day.
- In contrast, circadian rhythms complete one cycle daily, while infradian rhythms such as the menstrual cycle have periods longer than a day.
- Ultradian rhythms include blood circulation, blinking, pulse, hormonal secretions such as growth hormone, heart rate, thermoregulation, micturition.

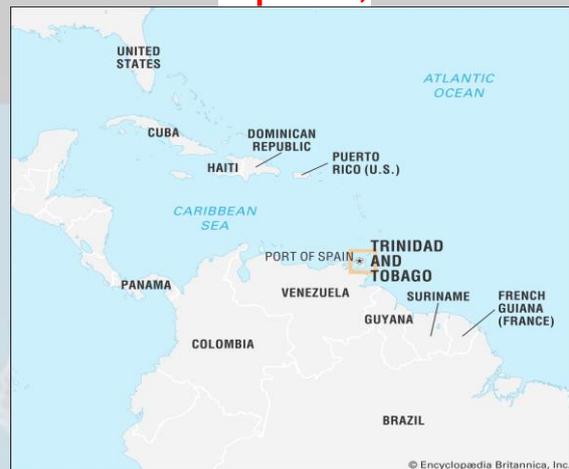


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- Through the night, individuals cycle through these stages multiple times, with each cycle typically lasting around 90 minutes.
- During REM sleep, the individual dreams, while non-REM sleep is crucial for the individual to restore themselves physically and consolidate their memories.
- Ultradian rhythms also influence patterns of hormone release, such as the pulsatile secretion of growth hormone, cortisol, and insulin.
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Tobago Island, Trinidad and Tobago

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- The country is considering declaring an international emergency to deal with the spill, which has stained kilometers of its shores and threatens to spread to its Caribbean neighbors.
- Trinidad is the largest island in the nation of Trinidad and Tobago, off Venezuela's coast in the southern Caribbean.

The capital, Port of Spain,



AI as a disruptive factor

- introducing Artificial Intelligence (AI) into this equation completely complicates the idea of reforming meritocracy.
- First, by its very nature, AI questions the basis of human merit by introducing a non-human entity capable of performing tasks, making decisions, and even 'creating' at levels that can surpass human abilities.
- Second, the advent of AI challenges the traditional notion of individual merit by prioritizing access to technology.
- Third, AI systems trained on historical data can perpetuate and even exacerbate biases present in that data, leading to discriminatory outcomes in areas such as hiring, law enforcement, and lending.
- Fourth, a recent paper published in Nature Medicine showed that an AI tool can predict pancreatic cancer in a patient three years before radiologists can make the diagnosis.

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Capabilities such as this can lead to the displacement of jobs that involve routine, predictable tasks

- Fifth, the opaque nature of many AI algorithms, coupled with the concentration of power in a few tech giants, poses significant challenges to accountability.
- Sixth, at the organizational level, the core of AI's power lies in data and algorithms that process this data. Tech giants with access to unprecedented volumes of data have a distinct advantage in training more sophisticated and accurate AI models.

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AR6 (IPCC)

- Three reports from the IPCC's sixth assessment cycle (AR6) were published in 2021-2022.
- These documents examine the consequences, adaptation, and vulnerability as well as the mitigation aspects of climate change.
- The Sixth Assessment Report (AR6) warned that the time to limit the rise of the world's average surface temperature to 1.5 degrees Celsius from the pre-industrial era as agreed in the Paris Agreement is running out and that we are close to breaching adaptation limits.
- To assess the world's progress towards the goals of the Paris Agreement, UNFCCC countries conduct a 'global stocktake' (GST) every five years

- After the AR6 synthesis report, the IPCC initiated its seventh cycle (AR7) by electing an IPCC bureau.

What is meant by 'global stocktake'?

- To assess the world's progress towards the goals of the Paris Agreement, UNFCCC countries conduct a 'global stocktake' (GST) every five years.
- The GST is a mechanism to measure collective progress, identify gaps, and chart a better course of climate action.
- The first GST started in 2022 and ended at the 28th session of the Conference of the Parties (COP28) to the UNFCCC in 2023.
- The first GST text, to which member countries agreed at the COP28 in Dubai last year, requested the IPCC to consider ways in which its work can be aligned with subsequent stocktake.
- The second GST is due in 2028, and member countries have requested the IPCC to publish its AR7 assessment reports before so that countries could measure their progress against the state of the planet.

The Hindu

Sominsai

- One of the strangest Japanese festivals
- Men cleanse their bodies in a river during the Sominsai Festival at Kokuseki-ji Temple in Oshu, with aggressive jostling ensues as participants vie for wooden charms, symbolising the fervour and

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intensity of the ancient ritual's
climax and communal spirit.
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- Attappady Thuvara has seeds with white coat.
- These are bigger and have higher seed weight than the regular variety.
- Compared to the garlic produced in other areas, the garlic from the Kanchalloor Vattavada area of Devikulam block panchayat in Idukki contains higher amount of sulphides, flavonoids, and proteins.
- Onattukara Elu and its oil are famous for its unique health benefits.
- Relatively higher antioxidant content in Onattukara Elu helps in fighting the free radicals which destroy the body cells.
- Kodungalloor Pottuvattari cultivated in Kodungalloor and parts of Ernakulam is consumed as juice and in other forms.
- This snap melon, which is harvested in summer, is excellent for quenching thirst

The Tamakoshi River

- The Tamakoshi River is part of the Koshi or Sapta Koshi river system in Nepalese Himalayas.
- It originates from the Ronggar Chu and Lapchi Gang rivers close to the Nepal-Tibet border.
- It flows in a southern direction through Bagmati Province in Nepal, namely through Dolakha District and Ramechhap District.

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