



## A 3600 Years Old Site

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As per the Archaeological Survey of India (ASI), a rural settlement had thrived at **Bharati Huda** in Jalalpur village in **Odisha's** Cuttack district, about **3600 years ago**.

- This is based on the ancient artefacts and grain discovered by the ASI from the mentioned site in the year 2018.
- The age of the settlement was arrived at after **radiocarbon dating of charcoal samples** found at the site by the **Inter University Accelerator Centre (IUAC)** in New Delhi using **Accelerator Mass Spectrometry (AMS)**.

### Other Findings

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- **Chalcolithic Culture:** The excavated remains indicate **existence of Chalcolithic culture** in the valley as attested by the presence of mud structural remains, large quantity of potsherds, ground and polished stone tools, bone tools, beads of semi-precious stones, terracotta objects, huge quantity of faunal remains and carbonized grains.  
The site has cultural **similarity** with Golabai Sasan, Suabarei and other excavated and explored sites in the **Mahanadi delta** and **partial similarity** with the chalcolithic sites of **middle Mahanadi valley** and sites of central and eastern India.
- **Economy:** The inhabitants **practised agriculture and animal husbandry** as attested by the findings of **domesticated varieties of rice and jute and evidence of domesticated cattle** among the faunal remains as well as **terracotta bull figurine**.

- **Worship:** A new religious belief emerged in the form of nature worship as evident from a single specimen of the **Sun motif** found arrayed in chocolate-slipped pottery.
  - **Sun worship** dated back to 1099 BCE in the Prachi valley. Devotees from different parts of Odisha as well as the neighbouring States congregated at Chandrabhaga on the shore of the Bay of Bengal on the occasion of Magha Saptami to pay homage to Sun God.
  - The world famous **Sun temple of Konark**, located some 30 kilometres from the excavation, was built in the 13<sup>th</sup> century CE. **The tradition of Sun worship seems to have evolved with human settlements in the region.**
- **Co-existence:** The excavation confirmed that a **separate ethnic group** that was using **non-black-and-red ware** might have existed during the early chalcolithic cultural horizon and a new class of ethnic group might have come into contact with the rural settlers at Bharati Huda during the mature phase of chalcolithic culture.

## Chalcolithic Culture

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- As the name indicates, during the Chalcolithic (**Chalco = Copper and Lithic = Stone**) period, both **metal and stone were utilized** for the manufacture of the equipment in day-to-day life.
- It spanned around **2500 BC to 700 BC**.
- Since this was the first metal age, copper and its alloy bronze which melt at low temperature were used for the manufacture of various objects during this period.
- By far the most important sites of this period are the **Indus Valley Sites**.

## Radiocarbon Dating

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- Radiocarbon dating (usually referred to simply as **carbon-14 dating**) is a radiometric dating method. It uses the naturally occurring radioisotope carbon-14 (<sup>14</sup>C) to estimate the age of carbon-bearing materials up to about 58,000 to 62,000 years old.
  - <sup>14</sup>C is also used in climate studies, biomedicine applications and many other fields.
- **Accelerator Mass Spectrometry (AMS)** is a highly sensitive method of **counting atoms**. The most widely used isotope studied with AMS is <sup>14</sup>C. It is used to detect very low concentrations of natural isotopic abundances (typically in the range between 10<sup>-12</sup> and 10<sup>-16</sup>) of both radionuclides and stable nuclides.

## Inter University Accelerator Centre

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- The Inter University Accelerator Centre was **the first Inter-University Centre** to be established by the **University Grants Commission (UGC)** in **1984**.
- It was formerly known as Nuclear Science Centre.
- The primary objective of the Centre is to establish within the university system a world class facilities for **accelerator based research**.

- Its aim is to formulate common research programmes of research and development in collaboration with universities, IITs and other research institutions.
- It is located in **New Delhi**.

**Source: TH**