

Archaeologist finds Mesolithic-era rock painting in Guntur

Ramesh Susarla
ANANTAPUR/GUNTUR

A Mesolithic period rock painting depicting a person tilling a piece of land has been found by D. Kanna Babu, former Superintending Archaeologist of the Temple Survey Project (Southern Region) of the Archaeological Survey of India, Chennai, in Orvakallu village in Guntur district, Andhra Pradesh.

Mr. Kanna Babu told *The Hindu* that while surveying the lower River Krishna Valley to ascertain the architectural features of shrines, he identified a new prehistoric rock painting



Historic find: The painting of a man tilling land found in a cave shelter at Orvakallu village in Guntur district. SPECIAL ARRANGEMENT

ing on the walls and ceiling a hillock at Orvakallu. "After an intensive ex-

ploration, it was noticed that these were shelters for prehistoric humans who lived at this place. Among these five naturally formed caves, two are embellished with distinguished depictions of rock paintings on the back walls and ceilings executed by people of Mesolithic Age, roughly [from] 5000 BC," he said.

Mr. Babu added that the paintings were made with "natural white kaolin and red ochre pigments", as well as that most of them had been "badly damaged" due to exposure to "air and wind". "However, some of the sketches and outlines are still intact for

the visitors," he said.

Ochre is a pigment composed of clay, sand, and ferric oxide. Kaolinite is a soft, earthy, and usually white mineral produced by the chemical weathering of aluminium silicate minerals like feldspar.

Culture of people

According to Mr. Babu, the find throws light on aspects of the social life and culture of the people who lived in the area.

One of the paintings depicted a man catching wild goat with his left hand while wielding a hook-like implement to control it. Another showed two cou-

ple standing with their hands raised while a child stood behind them.

Mr. Babu also singled out a painted figure of a man holding a plough and appearing to be tilling land – an indication, in his telling, "of a semi-settled life pattern" in which members of this community domesticated animals and cultivated and harvested crops.

Earlier, in 2018, archaeologists had uncovered prehistoric rock art estimated to be from the Neolithic era, circa 1500-2000 BC, on natural limestone formations near Dachepalli in Guntur district.

Uniform Civil Code part of Directive Principles of State Policy, says Rajnath Singh

The Hindu Bureau
NEW DELHI

Union Defence Minister Rajnath Singh on Monday questioned the controversy being created over Uniform Civil Code, saying it was part of the Directive Principles of State Policy laid down in the Constitution.

"Is Uniform Civil Code not in the Directive Principles of the Constitution of India? Why is then controversy being created over this?" Mr. Singh said.

"If the government does something by deviating



Rajnath Singh

from the Constitution, going beyond its limits, then it should be considered wrong. But here, it is not the BJP which made the Constitution, it was Babasaheb Bhimrao Ambedkar who made the Constitution

and Jawaharlal Nehru was also part of the team."

Mr. Singh was speaking at an event in Uttarakhand to mark the completion of nine years of the Narendra Modi government at the Centre.

The Minister said the Law Commission was collecting opinion about the UCC from across the country.

"Is there no UCC in Goa? Why are there objections? Is there no UCC in M.P.?" Mr. Singh said.

He added that all objections against the UCC was part of vote-bank politics.

Senior IPS officer Ravi Sinha appointed next chief of RAW

The Hindu Bureau
NEW DELHI

The Appointments Committee of the Cabinet (ACC) on Monday appointed senior Indian Police Service (IPS) officer Ravi Sinha as Secretary, Research and Analysis Wing (RAW), the country's external intelligence agency.

Mr. Sinha succeeds Samant Kumar Goel, who will complete his four-year tenure on June 30, an official order said.

A 1988-batch IPS officer of the Chhattisgarh cadre, Mr. Sinha is currently Special Secretary in the Cabinet Secretariat.

The ACC has approved Mr. Sinha's appointment as Secretary, RAW, for a tenure of two years, the order issued by the Ministry of Personnel said. Mr. Sinha has been posted with RAW for the past 20 years and was heading the counter-terrorism wing.



Ravi Sinha

His predecessor, Mr. Goel, was appointed RAW chief for two years in June 2019. He was later given two extensions.

The 59-year-old Mr. Sinha has been credited with making a significant progress in employing modern technology in the process of intelligence gathering.

In his new role, Mr. Sinha is expected to integrate technological and human intelligence dimensions to address the challenges of today's times.

(With inputs from PTI)

Gandhi Prize is a great honour, says Gita Press, declines cash award

The Hindu Bureau
NEW DELHI

Gita Press on Monday said it was a "matter of great honour" to be conferred the Gandhi Peace Prize but added that it would not accept the cash component of the award keeping with its tradition of not receiving any kind of donation.

The publisher thanked Prime Minister Narendra Modi and the Union Culture Ministry for conferring the prestigious award on it. The recipients get ₹1 crore, a citation, a plaque, and an exquisite traditional handicraft or handloom item.

"It is a matter of great honour for us. It is our principle not to accept any kind of donations, so the trustee board has decided not to take the award in any monetary form. However, we will certainly accept the award for the honour of it," Gita Press manager Lalmani Tripathi said. Established in 1923, Gita Press is one of the world's largest publishers of Hindu religious texts.

BJP hails decision

A day after the Congress called the decision to award the prize to the publisher a "travesty", saying that it was akin to "award-

ing Savarkar and Godse", the BJP on Monday hailed the move.

BJP president J.P. Nadda said, "Your contribution for the last 100 years in the preservation and flourishing of India's glorious Sanatan culture is commendable. The selfless service that you have done by taking our holy books across the globe is an inspiration for all of us."

Union Home Minister Amit Shah said, "If India's glorious ancient Sanatan culture and scriptures can be read easily today, it is due to Gita Press's unmatched contribution. Conferring Gandhi Peace Prize 2021 on Gita Press is an honour of the work being done by it."

Union Minister Jitendra Singh said "Gita Press is associated with the culture of India, associated with Hindu beliefs... and those levelling allegations against Gita Press were those who say that Muslim League was secular".

Meanwhile, Communist Party of India (CPI) MP P. Sandosh Kumar wrote to Mr. Modi opposing the decision, saying, "Since its inception, Gita Press has been instrumental in spreading the ideology of militant Hindu nationalism."

Bhavani makes history, becomes first Indian to win Asian c'ship medal



Trend-setter: Bhavani's bronze is India's first in the continental event. FILE PHOTO: VV. KRISHNAN

FENCING

Sports Bureau
CHENNAI

Olympian C.A. Bhavani Devi created history by securing India's first-ever medal - a bronze - at the Asian fencing championships in Wuxi, China, on Monday.

Bhavani lost to Uzbekistan's Zaynab Dayibekova in a hard-fought semifinal 14-15 of the women's sabre event, but ensured India its maiden medal in the event.

Earlier, she shocked reigning world champion Misaki Emura of Japan 15-10 in the quarterfinals, her first win against the Japanese fencer.

Bhavani said her dream to beat a few top-ranked players in the world had



BHAVANI. TWITTER/AMBIHAWANDEVI

been realised and she was particularly happy to get the better of Misaki.

"It feels great to become the first Indian to win a bronze for the country at

the Asian meet. Beating Misaki was huge because she is a good and consistent fencer. I had lost in the round of 16 to Misaki in the previous Asians, but I had a plan this time and it worked," Bhavani told *The Hindu* over phone from Wuxi.

The Indian gave it her all before losing the last-four clash. At 14-14, the referee flashed the red card against Bhavani for 'early start'. She wanted a video referral, but the referee rejected it on the grounds that it is available only for 'blade contact'. Both fencers had received a yellow card earlier in the match.

The 29-year-old Bhavani's next assignment will be the World championships in Milan from July 22 to 30.

Phonons on the chopping block: Are 'sound particles' quantum too?

Quantum computers use qubits as their basic units of information. Physicists have found that packets of vibrational energy (phonons) behave like packets of light energy using a new kind of beam-splitter. This could technically qualify them to act as qubits as well

Yasudevan Mukunth

H. Qiao, E. Dumur et al, 'Splitting phonons: Building a platform for linear mechanical quantum computing', *Science*, June 8, 2023

Quantum computers and artificial intelligence are two of the emerging areas of interest in the realm of computing. Recently, IBM published a paper in which it claimed to have demonstrated that a quantum computer could solve a useful problem that today's conventional computers can't, a result merited by concerns that their computations might become too unreliable when they also become complicated.

What are qubits?

Quantum computers use qubits as their basic units of information. A qubit can be a particle – like an electron; a collection of particles; or a quantum system engineered to behave like a particle. Particles can do funky things that large objects, like the semiconductors of classical computers, can't because they are guided by the rules of quantum physics. For example, these rules allow each qubit to have the values 'on' and 'off' at the same time. The premise of quantum computing is that information can be 'encoded' in some property of the particle, like an electron's spin, and then processed using these peculiar abilities. As a result, quantum computers are expected to perform complicated calculations that are out of reach of the

best supercomputers of today.

Other forms of quantum computing use other units of information. For example, linear optical quantum computing (LOQC) uses photons, the particles of light, as qubits. Just like different pieces of information can be combined and processed by encoding them on electrons and then having electrons interact in different ways, LOQC offers to use optical equipment – like mirrors, lenses, splitters, waveplates – with photons to process information.

In fact, any particle that can be controlled and manipulated using quantum-mechanical phenomena should, on paper, be usable as an information unit in a quantum computer.

Understanding phonons

Physicists thus wondered whether they can use phonons as qubits. Photons are packets of light energy; similarly, phonons are packets of vibrational energy. Therefore, the question is – can we build a quantum computer whose information unit is, colloquially speaking, sound? According to a paper published in *Science* this month, it should be possible.

While researchers can manipulate electrons using electric currents, magnetic fields, etc. and photons with mirrors, lenses, etc. they needed new tools to manipulate phonons. To this end, in the new study, researchers from the University of Chicago have reported developing an acoustic beam-splitter.

Beam splitters are used widely in optics research. Imagine a torchlight shining light along a straight line. This is

basically a stream of photons. When a beam-splitter is placed in the light's path, it will split the beam into two, that is, it will reflect 50% of the photons to one side and let the other 50% pass straight through.

While it seems simple, the working of a beam-splitter actually draws on quantum physics. If you shine a million photons at it, it will create two beams, each of 5,00,000 photons. We can then reflect these two beams to intersect each other, creating an interference pattern.

However, researchers have found that an interference pattern appears even when they shine photons at the beam-splitter one by one.

They are two reasons behind this. First, particles can also behave like waves, and second, until an observation is made, a quantum system exists in a superposition of all its possible states (like a qubit being partly 'on' and partly 'off' at the same time). So, when the single wave interacts with the beam-splitter, it enters a superposition of the two possible outcomes – reflected and transmitted. When these states recombine, an interference pattern shows up.

The findings of the study

In the new study, the researchers developed an acoustic beam-splitter – a tiny device resembling a comb, with 16 metal bars jutting out of it. It was placed in the middle of a two-mm-long channel of lithium niobate. Each end of the channel had a superconducting qubit – a qubit whose circuit components were superconducting – that could both emit

and detect individual phonons. The whole setup was maintained at an ultra-low temperature. If these phonons were converted to sound, their frequency would be too high for humans to hear. Each phonon in the study represented, according to the paper, the "collective" vibration of around one quadrillion atoms.

The team found that these phonons interacted with the comb just like photons interact with an optical beam-splitter. When a phonon was emitted from the left side of the channel, it was reflected half of the time and transmitted to the right side the other half.

When phonons were emitted simultaneously from the left and the right sides, they both ended up on one side (as expected).

A phonon-based computer... ?

"The basic science question is whether phonons ... actually behave the way quantum mechanics says they should," Andrew Cleland, a physicist at the Pritzker School of Molecular Engineering and a member of the study team, told *Physics* magazine. His team's tests proved that they do.

But it's still a long way from here to a functional quantum computer that uses phonons as units of information. As University of Nottingham physicist Andrew Armour put it more broadly in *Science News*: "What you're doing is extending the [quantum] toolbox... People will build on it, and it will keep going, and there's no sign of it stopping any time soon."

India gifts *INS Kirpan* to Vietnam, focuses on enhancing defence relations, security

The Hindu Bureau
NEW DELHI

India gifted the indigenously-built in-service missile corvette *INS Kirpan* to Vietnam to enhance its naval capabilities. Defence Minister Rajnath Singh announced this on Monday after bilateral talks with his visiting Vietnamese counterpart General Phan Van Gang.

"Progress on various bilateral defence cooperation initiatives was reviewed during the meeting, with both sides expressing satisfaction at the ongoing engagements," a Defence Ministry statement said on the talks while stating that the two Ministers focused on enhancing cooperation between defence industries of both countries and maritime security.



Fresh ties: Rajnath Singh and Vietnam Defence Minister General Phan Van Gang in New Delhi on Monday. SPECIAL ARRANGEMENT

Both Ministers identified means to enhance existing areas of collaboration, especially in the field of defence industry cooperation, maritime security and multinational cooperation, the Ministry said. Gen. Phan also visited headquarters of the Defence Research and Development Organisation (DRDO) and discussed ways to enhance "defence industrial capabilities by

cooperation in defence research and joint production".

Earlier in the day, Gen. Phan laid a wreath at the National War Memorial and was later given a triservice guard of honour. He arrived in India on Sunday on a two-day visit.

INS Kirpan is a Khukri class missile corvette displacing 1,350 tonnes and was commissioned into the Navy on January 12, 1991. It

has a displacement of close to 1,400 tonnes, a length of 91 metres, a beam of 11 metres and is capable of speed in excess of 25 knots. The ship is fitted with a medium range gun, 30 mm close range guns, chaff launchers and surface-to-surface missiles, according to the Navy.

In June 2022, India and Vietnam signed an MoU on mutual logistics support in presence of the two Defence Ministers during Mr. Singh's visit to the South East Asian nation. The two Defence Ministers also signed the "Joint Vision Statement on India-Vietnam defence partnership towards 2030".

Hanoi has procured 12 high speed patrol boats for the Vietnamese border guard force under a \$100mn Line of Credit (LoC) extended in 2014.

'Modi, Biden to discuss every issue relevant to India, U.S.'

Foreign Secretary says that India and U.S. are focused on how defence industrial companies can form a supply line ecosystem; the PM will also interact with the Indian diaspora in two phases

Kallol Bhattacharjee
NEW DELHI

Every global and regional issue that is relevant to India and the U.S. is expected to feature in the bilateral dialogue that Prime Minister Narendra Modi will hold with President Joe Biden during his upcoming official state visit to the U.S., Foreign Secretary Vinay Mohan Kwatra said on Monday.

Apart from official engagements, Mr. Modi's visit will include meetings with the Indian diaspora and CEOs from the corporate world.

"Every regional and global issue that are important in the context of India-U.S. relationship will be discussed [by Mr. Modi and Mr. Biden] as per availability of time," Foreign Secretary Vinay Mohan Kwatra said in a special briefing on the visit, explaining that "larger issues" that are of strategic importance to both sides would be taken up during the meeting.

Talks between leaders

The discussion between the two leaders will also include India's presidency of the G-20, which will meet here in India at the level of the leaders in September. Mr. Modi's visit comes at crucial time for South Asia,



Foreign Secretary Vinay Mohan Kwatra, MEA spokesperson Arindam Bagchi and Ausaf Sayeed during a press conference. PTI

which is witnessing political instability and conflicts in Pakistan, Afghanistan and Myanmar.

That apart, the U.S. in recent months has taken several steps, including the imposition of a ban on visa to disruptors of democracy in election-bound Bangladesh. As a result of these factors that are unfolding in India's vicinity, there are expectations that the Modi-Biden talks may also take up regionally significant developments.

"The focus is on what India is trying to do in its G-20 presidency, especially regarding priorities, interests and concerns of the Global South. The large chunk of the Global South remains unrepresented in the G-20. The idea is to put that on the table in terms of it being included into the G-20. These will feature in the discussion that

the honourable Prime Minister and the President will hold," Mr. Kwatra said, indicating that Africa will feature in the bilateral discussion between the two sides, especially in the context of the G-20.

Ceremonial welcome

Mr. Modi will receive a ceremonial welcome at the White House on June 22 morning, which is expected to be attended by a large number of invitees. The bilateral official discussion that will follow, Mr. Kwatra said, is likely to include a "strong tech component" covering telecom, space, manufacturing, and possibly semiconductors.

The Prime Minister's first event upon landing in the U.S. will take place in the premises of the United Nations, where he will lead a large number of yoga enthusiasts on International

Day of Yoga. Diplomats from many UN member countries are expected to participate.

Yoga event

The annual event under the UN began after the UN General Assembly passed a resolution in 2014 to adopt the International Day of Yoga.

Mr. Kwatra said India and the U.S. are focused on the relatively new component of the relationship of "defence industrial companies". "We are working on how Indian and American defence industrial companies can form a supply line ecosystem," Mr. Kwatra said.

The Foreign Secretary said Mr. Modi's interactions with business leaders and the Indian diaspora would be held in two phases, with one event taking place at the Kennedy Center, which will include captains of industry and young achievers from the Indian American community.

Another diaspora event is being planned by the Indian community at the Ronald Reagan Building and International Trade Centre on the evening of June 23. This will be the last event that Mr. Modi will attend before flying to Egypt, where he will pay a state visit from June 24 to 25.