WHERE TIME STANDS, STILL

WatchTime India takes you to some historical observatories and clock towers across the country.

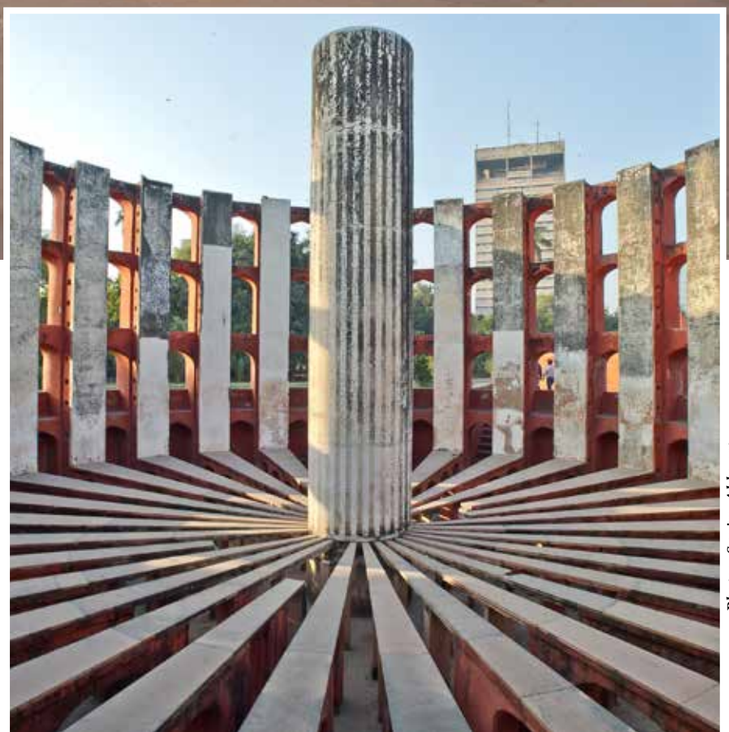
BY AISHWARYA SATI

The Rajabai Clock Tower in Mumbai illuminated at night.

Photo: Amey Mansabdar

India's Horological Heritage

Delhi's Jantar Mantar was built in 1724. Besides timekeeping, it also calculates the Sun's positions in different seasons.



Photos: Sanjay Ahlawat

ime is really the only capital that any human being has, and the only thing he can't afford to lose. Thomas Alva Edison

Time is intangible. And, like the tasteless, colourless Adam's ale, its value is immeasurable.

Man's quest to measure time can be traced back to the primitive era, when hunter-gatherers used positions of celestial bodies for timekeeping. The Sun, for instance, was used for counting the days and years, and the Moon for keeping track of months.

Since then, it has taken centuries of diligence and innovation to achieve accuracy in timekeeping. The Egyptians probably were the first to create a 24-hour day. They used a shadow clock or sundial, which worked on the principle of the shadow cast by a vertical stick thrust against sunlight on the ground.

Sundials were used as early as 3500 BC, and in 1500 BC the Egyptians invented portable sundials. They, however, were inaccurate and useless after sunset.

Furthermore, the realisation that the Sun rose and set in different locations according to seasons led to more innovations.

The Indian civilisation, too, was devising its own methods of measuring time, which led to experiments with water clocks, sundials and pendulum clocks. But the most important role was that of astronomy.

According to Amitabh Pandey, astronomer and founder of Science Popularisation Association of Communicators and Educators (SPACE), Indians relied heavily on the planetary positions to determine time. "We added an extra month to our calendar, influenced by the Sun, the Moon and planets, to accommodate festivals during different seasons. This is different from the Gregorian calendar of the Romans, who thought February was inauspicious," he says.

The need for a uniform standard time came with the advent of railways and telegraph, says Amitabh. That led to the

creation of clock towers or *ghari ghars* in most towns under the British Raj.

WatchTime India takes a look at some of these unique sundials and clock towers, which give an insight into the rich craftsmanship and timekeeping heritage.

JANTAR MANTAR

It is regarded as one of the largest observatories in the world. The name derives its roots from the Sanskrit words 'yantra' and 'mantra' meaning instruments and formula respectively and is an absolute indication of the advanced astronomical science in India.

Jantar Mantar is actually a series of five architectural wonders built in Ujjain, Varanasi, Mathura, Delhi and Jaipur. The Jaipur unit was commissioned by Maharaja Jai Singh II during the 1720s and is the largest. It houses the world's largest sundial, Samrat Yantra—90ft high and 148ft wide.

"The term yantra was later on replaced with *jantar* meaning magic, as these observatories housed fascinating astrological instruments, which delighted astronomers and historians," says Pandey. "The sundial at Jaipur gives an accuracy of about two seconds and can even tell the time at night, too."

Another notable instrument here is the Shasthansa Yantra—a dark chamber with a pinhole through which the sun-

The Jantar Mantar unit in Jaipur.

Photos: AFP

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A view of the Rajabai Clock Tower (extreme left). Close-up of the clock installed at the tower.

Photo: Janak Bhat

LONDON-BASED WATCHMAKERS LUND & BLOCKLEY DESIGNED THE ICONIC CLOCK WITH CHIMES AND CARILLONS, PROGRAMMED TO PLAY 16 TUNES.

light enters—used to calculate the declination and diameter of the Sun. Jai Prakash or Mirror of the Heavens is an observatory to study the night sky and stars.

Delhi's Jantar Mantar was built in 1724. The sundial here is about 70ft tall and 114ft wide. Besides timekeeping, it also calculates the Sun's positions in different seasons. The Misra Yantra here can tell the shortest and longest days of the year and can indicate noon time in cities across the world.

RAJABAI CLOCK TOWER

Perhaps one of the most imposing structures in Mumbai, the 280ft-tall Rajabai Clock Tower stands on the sprawling Mumbai University campus. It was designed in 1869 by George Gilbert Scott—described by *The Guardian* as "the most prolific architect of his age, and possibly of all time".

Scott, who built the famed St Pancras Renaissance London Hotel, modelled the tower on the Big Ben, and it became operational in 1878.

The tower, which has a Venetian-Gothic architecture, was built at a budget of ₹2 lakh, a huge sum back then. It was fully funded by stockbroker Premchand Roychand, who founded the Bombay Stock Exchange in 1875. He had just one condition: the tower should be named after his visually impaired mother, Rajabai.

London-based watchmakers Lund & Blockley designed the iconic clock with chimes and carillons, programmed to play 16 tunes. John Taylor & Co., Leicestershire, manufactured the 16 bells—the largest of them weighing three tonnes. The bell frame, designed by General Hyde of the railways

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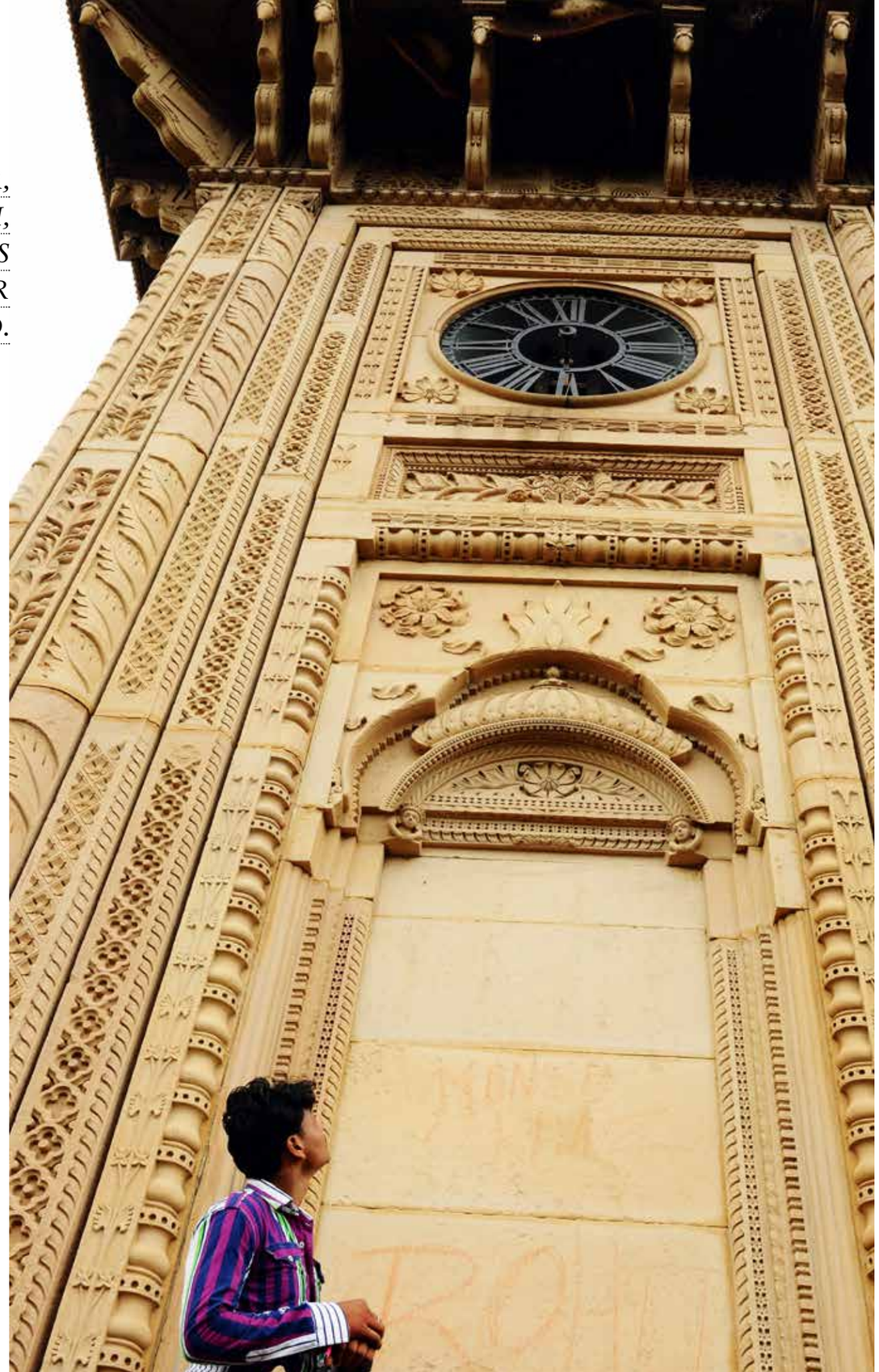
department, was made by Westwood Bailey and Co.

This clock tower is currently being restored by well-known architect Brinda Somaya, whose firm Somaya & Kalappa started work in July last year. "The Tata Consultancy Services gave the university ₹4.2 crore and this is the first time the Rajabai Clock Tower is being renovated, except for the stained glass, which was done a few years ago," says Somaya, who is hopeful of finishing the restoration before monsoon this year. "A lot of research and planning went into the process, and it has been quite challenging."

Since 1991, the clock has been maintained by Mumbai-based Venkat Rao, proprietor of Precision Watchmakers, established by his father in 1960. "We have the manpower and technology, but the only problem is that we have to wind it every night at around 8 o'clock," says Rao. "Sometimes the parts break or rust, especially the hands. So we have replaced them with brass. The university pays ₹14,000 a month for the clock's maintenance."

The clock at the Mirzapur tower stopped functioning 10 years ago.



Photos: Aayush Goel

The state government plans to collaborate with a US firm to start the renovation of the Mirzapur Clock Tower.

THE CLOCK TOWER OF MIRZAPUR

A city known for its carpet industry, Mirzapur in Uttar Pradesh houses one of the most significant clock towers in the country. The Indian Standard Time is calculated here, as it falls almost on the reference longitude of the IST, at 82.5 degrees.

The clock tower was built in the colonial era, with no stone left unturned in giving attention to detail. However, the clock installed atop the tower ceased functioning a decade ago. The glass is shattered and the hands are broken.

"It is an old heritage building and, in the days of its glory, its bells could be heard all over the town of Mirzapur," says District Information Officer Om Prakash Upadhyay. "It is a technical marvel, as it was carved out of stone and used to work with just solar energy."

The state government tried to restore the historical masterpiece, but indigenous watchmakers were unable to repair it. "Talks are on with a US firm to look into the renovation of this clock tower, which is a symbol of pride for our town," says Upadhyay.

Ghari Ghar or the Big Ben of Murshidabad lies between the Hazarduari Palace and Nizamat Imambara in West Bengal.

Photo: Salil Bera

Photos: B Jayachandran

The Methan Mani in Thiruvananthapuram depicts the face of a man in a skull cap flanked by rams on either side, which hit the cheeks as the clock strikes.

GHARI GHAR

This one is known as the Big Ben of Murshidabad, a historical city in West Bengal. It was designed by creative genius Sagore Mistri, who was an assistant of Colonel Duncan McLeod, the architect of Hazarduari Palace.

The towering structure lies on a vast stretch of land between the Hazarduari Palace and the Nizamat Imambara near the Madina mosque.

The 19th century Ghari Ghar also backed up as a lighthouse during its prime, and its heavy bell can still be heard. The impressive white dial with black Roman numerals is surrounded by a gothic black ring. A lion adorns each of the four corners of the roof, a befitting tribute to the royalty.

METHAN MANI

The clock tower opposite the Padmanabha Swamy Temple in Kerala's capital, Thiruvananthapuram, is one of the oldest structures in the city. It was installed 173 years ago during the reign of Maharaja Swathi Thirunal.

The proposal was made by the commercial agent of the erstwhile Travancore kingdom, John Caldecott, who bought two clocks from Chennai. One was installed at the Padmanabhapuram Palace near Kanyakumari in Tamil Nadu and the other in Trivandrum or Thiruvananthapuram.

"A carpenter named Kulathooran also known as Soothram Asari (trick carpenter), designed a unique innovation, with a smiling face of a bearded man wearing a skull cap flanked by two rams. When the clock strikes every hour, the rams hit the face," says historiographer Uma Maheswari.

Workers were appointed in shifts to strike a huge metal bell on the ground floor, after each chime. The quirky clock tower, which has never been restored, is still functional.

"It is an old, complex pulley mechanism with two boulders attached to needles, which are connected to a rod behind the clock," Maheswari explains. "There is a lever mechanism to make the rams strike the face every hour." ○