

#TECHNOLOGY

Have Tattoo to Monitor BP

"The sensor for the tattoo is weightless and unobtrusive. You place it there. You don't even see it and it doesn't move. You need the sensor to stay in the same place because if you happen to move it around, the measurements are going to be different," Jafari says



A new electronic tattoo can be worn comfortably on the wrist for hours to deliver continuous blood pressure measurements, a new study shows.

The measurements exceed accuracy levels of nearly all available options on the market today.

Blood pressure is one of the most important indicators of heart health, but it's tough to frequently and reliably measure outside of a clinical setting. For decades, cuff-based devices that constrict around the arm to give a reading have been the gold standard.

Blood pressure is the most important vital sign you can measure, but the methods to do it outside the clinic passively, without a cuff, are very limited," says Deji Akinwande, a professor in the electrical and

LED light sources shined through the skin. However, leading smartwatches are not yet ready for blood pressure monitoring. That's because the watches slide around on the wrist and might be far from arteries, making it hard to deliver accurate readings. And the light-based measurements can falter in people with darker skin tones and/or larger wrists.

Graphene is one of the strongest and thinnest materials in existence and it is a key ingredient in the e-tattoo. It is similar to graphite found in pencils but the atoms are precisely arranged into thin layers.

E-tattoos make sense as a vehicle for mobile blood pressure monitoring because they reside in a sticky, stretchy material encasing the sensors that is comfortable to wear for long periods and does not slide around.

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The device takes its measurements by shooting an electrical current into the skin and then analysing the body's response which is known as bio-impedance. There is a correlation between Bioimpedance and changes in blood pressure that has to do with blood volume changes.

However, the correlation is not particularly obvious, so the team had to create a machine learning model to analyse the connection to get accurate blood pressure readings.

In medicine, cuff-less blood pressure monitoring is the 'holy grail', Jafari says, but there isn't a viable solution on the market yet. It is the part of a larger push in medicine to use technology to untether patients from machines while collecting more data wherever they are allowing them to go and still get personalized care.

"All this data can help create a digital twin to model the human body, to predict and show how it might react and respond to treatments over time," Akinwande says.

Additional co-authors are from Texas A&M and UT Austin. The Office of Naval Research, the National Science Foundation, and the National Institutes of Health funded the work.

computer engineering department at the University of Texas at Austin, and a co-leader of the project, reported in Nature Nanotechnology.

High blood pressure can lead to serious heart conditions if left untreated. It can be hard to capture with a traditional blood pressure check because that only measures a moment in time, a single data point.

"Taking infrequent blood pressure measurements has many limitations and it does not provide insight into exactly how our body is functioning," says Roozbeh Jafari, a professor of biomedical engineering, computer science, and electrical engineering at Texas A&M University and the other co-leader of the project.

The continuous monitoring of the e-tattoo allows for blood pressure measurements in all kinds of situations: at times of high stress, while sleeping, exercising, etc. It can deliver thousands of measurements more than any device thus far.

Mobile health monitoring has taken major leaps in recent years primarily due to technology such as smartwatches. These devices use metallic sensors that get readings based on

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Jahangir was a Man of Many Religions

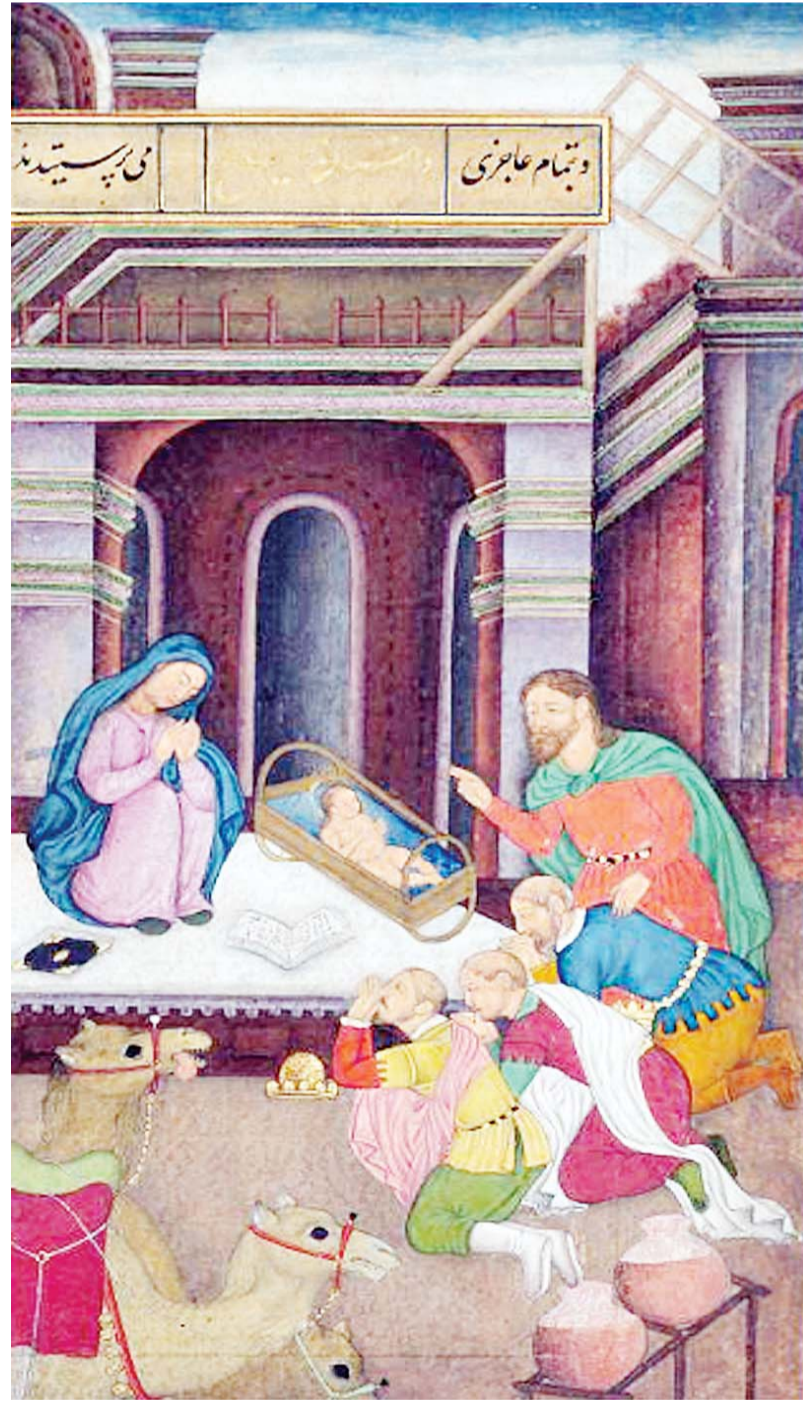
In Akbar's India, Jahangir writes: "There was room for the professors of opposite religions; and for beliefs good and bad and the road to altercation was closed. Sunnis and Shias met in one mosque, Christians and Jews in one church and observed their form of worship." Britain's first ambassador to the Mughal court memorably recorded Jahangir's own affirmation of religious tolerance voiced during what was clearly not an unusual drunken evening: "The good king fell to dispute the laws of Moses, Jesus and Muhammad. And in drink was so kind that he turned to me and said: 'Am I a king? You shall be welcomed.' Christians, Moors, Jews, he meddled not with their faith. They came all in love and he would protect them from wrong. They lived under his safety and none should oppress them. And this often repeated. But in extreme drunkenness he fell to weeping and to diverce passions, and so kept us till midnight."



Anjali Sharma Senior Journalist & wildlife enthusiast

Once Jahangir went to a temple in Agra. He took his grandsons Dara Shikoh and Aurangzeb along for the visit. While Dara had no issues visiting the temple with their grandfather, Aurangzeb, even as a young child at that time refused to enter the temple saying it will make him a Khafir 'non believer' and its blasphemy for him to enter a temple. Jahangir tried to convince his grandson Aurangzeb to come inside the temple but Aurangzeb simply refused so Jahangir left Aurangzeb outside and went inside with his other grandchild to offer prayers.

Jahangir was angry with Aurangzeb's non inclusive attitude, he came back and called Shah Jahan, his son and complained about his behaviour in the temple. But Aurangzeb never changed his attitude and disliked anything to do with Hindu or any other religion. Shah Jahan himself was an orthodox Muslim. That was to be expected since he had been adopted and brought up by Rupaiah Begum, Akbar's first wife. Akbar had handed over Prince Khurram aka Shah Jahan to Rupaiah for upbringing as a 6 days old baby. Later on in his life, he became more liberal, in his mid 40s Shah Jahan allowed Diwali and Holi celebrations in Delhi Fort. The change occurred because Dara Shikoh showed inclination towards Hinduism, Sufism and even Sikhism. As Shah Jahan's favourite son was Dara Shikoh, otherwise for most of his life Shah Jahan remained orthodox Muslim rather than a follower of many religions like his father Jahangir or grandfather Akbar.



An Atheist
Jahangir was born to a Rajput Princess Hira Kunwari. Although he practiced Islam, he called the extent Din-e-Ilahi his father Akbar's religion; he had no issues in participating in various other religious practices or going to Hindu temples. The British felt he was an atheist because he had Jesus and Mary pictures in his bedroom and also had Persian version of Bhagvad Gita in his bed room. Thomas Roe felt he was a Muslim when required and Hindu at other times. William Finch wrote that he was a Christian sometimes. Some felt he was a Jain other times because he loved to hold discussions with Jadrup Gosain the Jain muni in his ant mound (in forest). Jahangir celebrated Holi, Diwali, Raksha Bandhan and Dusshra in Agra fort. He also celebrated Christmas and Easter with Christians in court and visited churches in Delh, Lahore and Agra. He celebrated the Parsee festival of Nauroz with fervour in his palace. He was multi religious in celebrating various religious functions in his palace. Indeed, he was so taken up with Jainism as a religion that he converted to Jainism and took diksha; he called himself Jagat Guru and his chief consort Jodha Bai as Jagat Gosain.

Although converting to Jainism did not stop him from following Islam and Hindu rituals, and celebrating various religion festivities. Basically all the ambassadors of other countries and his own

#AKBARNAMA

courtiers were confused about which religion he practiced or belonged to.

Interesting Celebrations

Jahangir loved celebrating Rakhi the Hindu festival of bond between brothers and sisters. Jahangir not only had many Rakhi sisters, who were maids at palace but allowed commoners to tie him Rakhi. He even allowed the Hindu Nobels at his court to tie him Rakhi. Dussehra was another beloved festival of emperor Jahangir. He inspected horses, elephants, camels etc in his stable that day. The animals were decorated and presented in parade before the emperor.

Many temples had been destroyed in wars and raids by Mughal and other invaders in India. One such temple was the temple dedicated to Sri Krishna in Vrindavan and Mathura. When Jahangir became emperor he crowned Bir Singh Bundela, the ruler of Orchha, in 1605. Bir Singh sought Jahangir's permission to build a temple for Lord Sri Krishna in Vrindavan and Mathura. The Krishna Temple at Mathura was destroyed by Sikandar Lodhi in 16th



century Lodhi also prohibited bathing in Yamuna by Hindus and shaving their heads or doing any Hindu rituals on the banks.

Jahangir not only gave permission to build temple but apparently gave three lakhs to Bir Singh Bundela to build this temple. He also removed all restrictions that were in place before at Mathura for Hindus. Jahangir's mother Hira Kunwari, the wife of Akbar was a great devotee of Sri Krishna. Even Prince Dara Shikoh, son of Shah Jahan had presented a carved stone railing to the temple during his visit there. But it was removed on the orders of Aurangzeb in 1666. Aurangzeb demolished the entire Keshav Rai temple in 1670.

How Bir Singh Bundela became close to Jahangir is an interesting



Drunk or sober, Jahangir was a strikingly a tolerant ruler. As he travelled through his Empire, thousands would have been present to watch the Emperor's visits to holy men and to their shrines as well as to witness his public demonstration of a multi-faith society in action with awe and humility.



Jahangir celebrating the Festival of Holi with the ladies of the zenana.

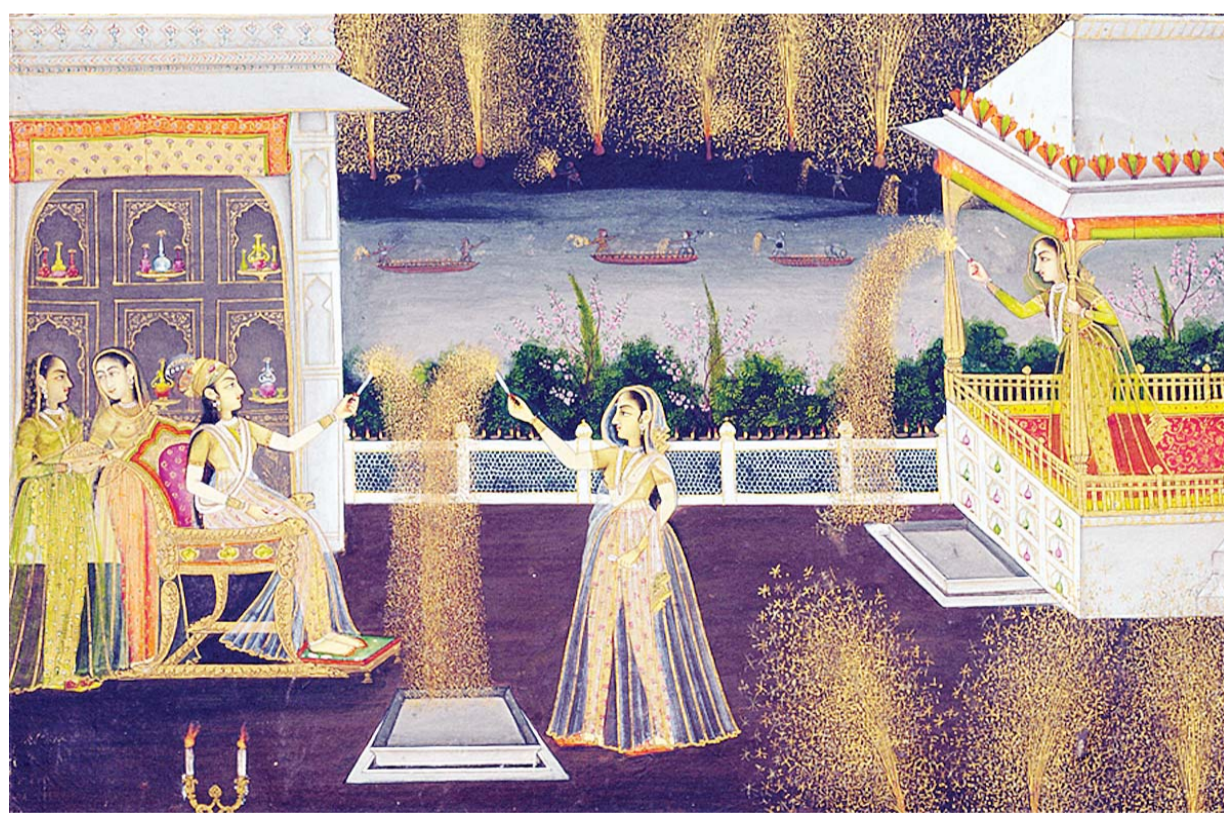
story Prince Salim had issues with Abul Fazl and hated him. Abul Fazl was the chronicler and friend of Akbar. Akbar trusted his words much more than Salim's. Once Akbar got unwell when Salim was in early 20s. Fazl suggested that Prince Salim may have poisoned him and Akbar chided his son. Prince Salim left the room in tears. Later it was found that Akbar was given stale dead animal meat that made him sick. Another time Akbar told Salim to get the women of the family to Kashmir. It was snowing heavily and landslides were taking place. So Salim left the women half way and went to inform Akbar that he will get them to Kashmir after the weather improves. Abul Fazl commented that it was Salim's duty to follow Akbar's orders and not decide what to do. Akbar was instigated to be furious with Salim and shamed him in front of all courtiers and commanders. Salim got so upset at this open humiliation that he did not come out of his tent for the whole day even for meals. There were other incidents too that made Salim hate Abul Fazl. So when he rebelled against Akbar in 1599, Abul Fazl started speaking against his rebellion in the court and that Salim was unfit to ascend Mughal throne.

That infuriated Salim, he called a chieftain of Orchha Bir Singh Bundela and told him that if he kills Fazl he will be rewarded. Bir Singh Bundela carried out his orders and

sent Fazl's head to Salim in Allahabad fort. With the result, Akbar was very angry with Salim and attacked Orchha and took it under his control in 1604. Bir Singh Bundela and his family went into hiding.

Finally in 1605, when Akbar died, Salim became emperor and made Bir Singh Bundela the King of Orchha. When Bir Singh Bundela became King of Orchha he sought the permission to build the Keshav Rai temple in Vrindavan and Mathura. Jahangir granted permission and gave a sum of thirty three lakhs for building the temple. It was one of the most magnificent temple built in Mathura. Aurangzeb had grave issues not only with Hindu religious practices but he disliked Jahangir, his grandfather because of various incidents. He ordered demolition of temple in 1670.

Jahangir observed Pitru Paksha and arranged Pind Daan; he called learned and religious man, gifted them, gave them food and sent Prince Khurram to Akbar's tomb to give away 10000 gold coins in alms to commemorate his father's death anniversary. In 1620, when Jahangir was in Kashmir he went on boat to watch the festival of 'Vetharwali' that is done to commemorate River Jehlum. In 1619, Jahangir went to Mathura and visited the temples of Vrindavan. In 1621, Jahangir visited the holy city of Haridwar and described it as 'one of the most holy



Sinkholes

It is a frightening thought to imagine the ground below your feet or house suddenly collapsing and forming a big hole in the ground. Sinkholes rarely happen, but when they strike, tragedy can occur. Sinkholes are common where the rock below the land surface can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground creating sinkholes.

cities of Hindus'. He gave money and alms to the Brahmins who worshipped at the ghats and even visited Kashi Vishwanath temple.

Jahangir followed his father's liberal religious policy. The fact that when Prince Salim rebelled against his father could have used his father's liberal policy of following various religions as a apostasy and yet did not, neither did historians in his regime use it as reason for his rebellion shows he was a liberal. When Abul fazl was killed again Salim could have conveniently blamed Akbar's renunciation of Islam as excuse for his crimes yet did not. In 1598, a Christian converted to Islam to marry his dead wife's niece and Prince Salim desired to punish him but Akbar forbade it. Jahangir like his father converted many Hindu religious texts into Persian and asserted there was not much difference between Sufism in Islam and Vedanta school of philosophy.

When Jahangir became emperor the Ulama assumed that Jahangir will be more favourable to Islam. Mullah Shah Ahmad wrote to various ministers in Mughal court to implement Sharia. Jahangir gave orders to Sheikh Farid to give names of four scholars who would oversee that nothing against Shariat is done in Empire. Mullah Ahmad wanted only one person appointed instead of four scholars and thus this matter reached stalemate. Jahangir ordered allowances to be given to Islam converts. In the sixth year of his reign he ordered a decree to the Governors of all provinces that they were not to convert anyone to Islam forcibly.

Jahangir allowed his friend Bir Singh Bundela to build a magnificent temple at Mathura. More than 70 new temples were allowed to come up in Benaras. He allowed Church to be built in Ahmedabad in 1620 and at Hugli. He allowed Christian cemeteries at Lahore and Agra. He allowed unhindered Hindu pilgrimage. Jahangir gave an allowance of Rs 7 to Christian fathers daily who were in Agra.

Religious Tolerance

In the opening section of his autobiography, Jahangir celebrates the religious tolerance observed and maintained by his father Akbar. In Akbar's India, Jahangir writes: "There was room for the professors of opposite religions; and for beliefs good and bad; and the road to altercation was closed. Sunnis and Shias met in one mosque, Christians and Jews in one church and observed their form of worship."

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Drunk or sober, Jahangir was a strikingly a tolerant ruler. As he travelled through his Empire, thousands would have been present to watch the Emperor's visits to holy men and to their shrines as well as to witness his public demonstration of a multi-faith society in action with awe and humility. But Jahangir also seems to have been driven by his own personal desire to explore the spiritual truths of other religion traditions. He had many private meetings with a renowned Hindu hermit Gosain Jadrup and he describes one of these in his autobiography:

The place he had chosen to live in was a hole on the side of a hill, which had been dug out and a door made. In this narrow and dark hole he passes his time in solitude. In the cold days of winter, though he is quite naked with the exception of a piece of rag that he has in front and



behind, he never lights a fire. I conversed with him and he spoke well, so much as to make a great impression on me."

In 1617, Jahangir had already met Jadrup Gosain, a Jain saint in Ujain. Saint Jadrup lived in an ant hill in Porthugal. Jahangir wanted to call him to Agra to meet him. But he desisted in the 11th year of his reign went to Ujain and went to the forest to meet him. Jahangir spent six garhis' with the saint in the forest. They both discussed the science of Vedanta. Jahangir was so impressed by Jadrup Gosain that he visited him again after three days and spent many hours talking to him. Jahangir and Thomas Roe both mention this visit in their books. In 1618, Jahangir halted his royal car, alcade and visited the saint again and spoke to him at length. He visited him twice during the halt. In 1620 Jadrup moved his residence from Ujain to Mathura. Jahangir visited him twice here and talked to him for hours on philosophy and religion etc.

Jadrup requested Jahangir that according to Vedas the weight of a dam was 36 seers and hence it was better to make one dam as 36 seers instead of 30 seers. Jahangir passed an order that the weight of a 'dams' be 36 seer in his empire. Mirza Aziz Koka met saint Jadrup and requested him to influence Jahangir to release Khusrau and Jahangir released Khusrau on the saint's request. Aziz Koka was Khusrau's father-in-law Hakim Beg the brother-in-law of Nur Jahan beat Jadrup with a whip on a small pretext, when Jahangir came to know he dismissed Hakim Beg from imperial service and never admitted him back.

Jahangir had great issues with Guru Arjun Singh as he sided with Prince Khusrav during the rebellion and passed capital punishment for treason. But some ministers intervened on his behalf and Jahangir decreed if Guru Arjun Dev paid 1,00,000 coins as fine he will be let off. Guru Arjun Dev refused to pay the fine. Diwan Chandu Lal of Lahore stood surety. The Diwan of



Thus like his father Akbar, Jahangir was not confined to one religion and he used to converse with various religion followers. He was one of the highest learned men of his times and knew many languages like Persian, Urdu, Hindi, Rajasthani etc. and could converse with various religious on varied religious topics.

Lahore tortured him and he asked to be allowed to bathe in river Ravi. He did not come out alive from the river. Jahangir celebrated various festivals grandly and publicly with his beloved pupils. Guerrorio has recorded festival of Muslims. Jahangir kept fasts for Ramadan and invited Shaikhs and Sayvids to break their fast on some days. On the seventh year of his ascension in 1612 Jahangir celebrated Rakhi festival publicly and allowed citizens to tie him Rakhi or sacred threads. In Bengal once on Maha Shivratri he met yogis and listened to their stories at night. Dussehra was celebrated every year by the emperor with inspection of Mughal troops, horses and elephants. On Diwali Jahangir and his ministers gambled. Christians could openly celebrate Christmas and Easter at Agra, Delhi and Lahore. Jahangir himself participated in Christmas festivities in the palace organized by British and Portuguese ambassadors. He kept Hindu astrologers at court to tell him auspicious dates and also weighed himself and his children on special days. Guerrorio records Jahangir discussing religious matters with Christian missionaries at court. Jahangir met the saint Mian Mir at Lahore and listened to his discourse.

Jahangir banned public sale of wine, opium and bang. He ordered total suppression of public gambling. Jahangir himself was a very heavy drinker in his adult years and recorded drinking 40 glasses of wine one day. But when his health deteriorated he reduced it to 10 glasses and than 6 glasses a day but added opium to get the intoxication. He banned child widows whose marriage was not consummated from burning on funeral pyre. He banned sati and it was only permitted with the consent of the woman by the governor of state himself. He banned castration of children.

Since Jahangir hunted wild boar many Muslim clerics felt he was a kafir or a non believer though none dared to say that openly. This King's disposition seems to be composed of extremes: very cruel and otherwise very mild; often overcome with wine, but severely punishing that fault in others. His subjects know not to disobey. He daily relieves many poor, and will in pitié help to carry sometimes his mother in a palanka on his shoulders. He speak respectively of our Saviour; but is offended at His cross

and poverty; thinking them incompatible to such majesty, though told that His humility was to subdue the world's pride.

A Christians Priest's account of Jahangir and the court

All religions were tolerated and their priests in good esteem. My self often received from the Mogoll him self the appellation of Father, with other many gracious words, with place amongst his best nobles. The Jesuites have not only admittance into his presence but encourage ments from him by many gifts, with libertie of converting to them; and to the subject, to be without loss of favour converted. He made tryall of one convert with many threats to deterre him from his new profession; and finding him undauntedly resolute, he assayed by flatteries and promises to re-gaine him; but therein also failing, hee bade him continue, and with a reward discharged him; having told him that if he could have frayed [i.e. frightened] or brought him from his religion, he would have made him an example for all wavurers. The chief Jesuite was Francisus Corsi, a Florentine by birth, being at the Mogols court agent for the Portugals. I would I were able to confirme the reports of their conversions. The truth is they have spilt the water of baptism upon some faces, working on the necessities of poore men, who for want of means, which they give them, are content to wear crucifixes, but for want of instruction are only in name Christians. I observed that of the poore there, five have begged in the name of Marie for one in the name of Christ.

Jahangir banned cow slaughter in his empire. He issued a decree or farman dated 14th September in 1605 prohibiting animal slaughter in Gujarat for six months a year on representation from Bhamu Chandra and Sidi Chandrar. The jizya or poll tax to visit Mount Satrunjaya was also abolished. In 1617, Jahangir invited Jain saint Vijaya Deva Suri to Mandu court and meet him. Jahangir was highly impressed with him and remained friendly with him even exchanging letters later on.

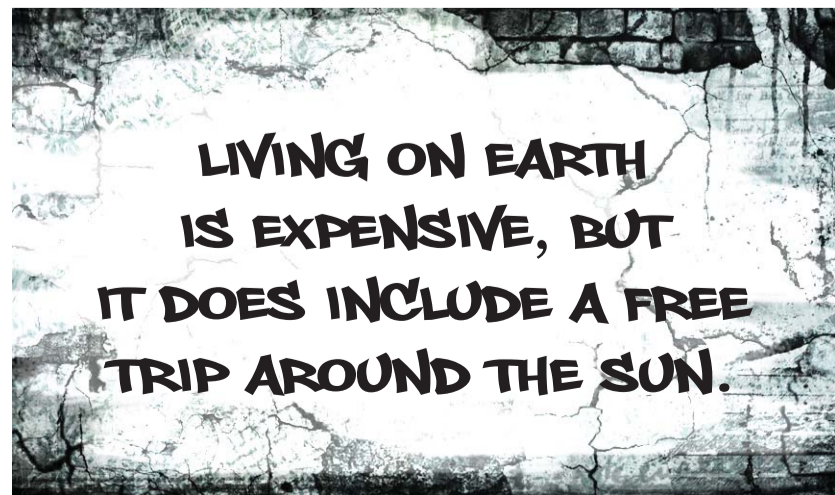
The Jogis of Jhakbar Gaddi Chandra Nath requested to grant 10 bigah land in his name in Punjab which was done through firmman by Jahangir. In 1600 Jahangir issued Firmran granting 178 bigahs of land to Ajumal Jangam of Jangambari pushkar near Benares. Jahangir visited Pushkar near Ajmer and granted many villages to firmman to Brahmins of Pushkar who worshipped the lake.

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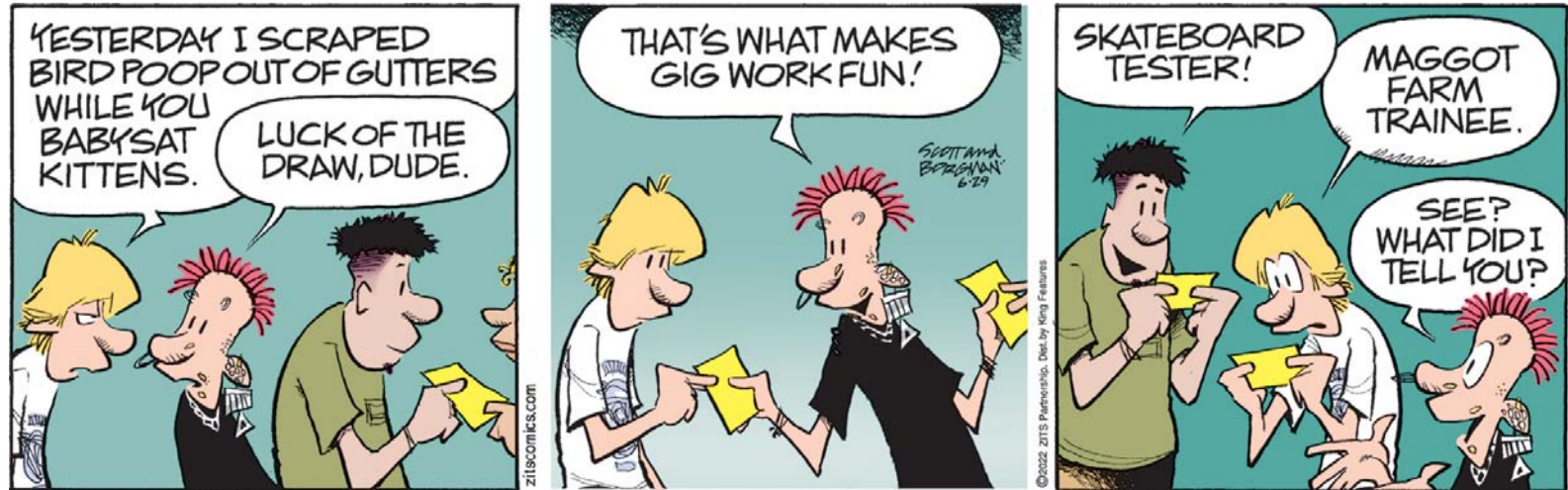
THE WALL



BABY BLUES



ZITS



By Rick Kirkman & Jerry Scott

By Jerry Scott & Jim Borgman

