

Imagine the way the world used to be viewed! Math, as known to be important but not thought to be something you could make a living at. Math 2.0 Day reminds us that technology is here to stay! For a lot of us, math wasn't a favourite subject, we'd spend the entire period staring at the equations and wondering what sort of livid madman designed these torture chambers on paper. Ultimately, we realized that math is utterly indispensable in our modern world.



#COVID-19

Tylenol In Wastewater

One interesting discovery in the new study involves acetaminophen, a pain reliever and fever reducer that serves as an active ingredient in over-the-counter medicines.



In a pilot project exploring ways to monitor COVID-19, scientists hunted for pharmaceuticals, such as Tylenol, and viral RNA at the same time in wastewater in Western New York.

The results of their study, published in the journal Environmental Science & Technology Letters, suggest that measuring the concentrations of medicines in wastewater could add another layer to disease-monitoring efforts.

"Wastewater based disease surveillance is being done worldwide through monitoring of viral RNA," says lead scientist Diana Aga, professor of chemistry and director of the University at Buffalo's RE-NEW Institute. "The potential of complementing existing efforts with detection of pharmaceuticals is exciting. There are a lot of opportunities here, though more research is needed."

Acetaminophen Spike

One interesting discovery in the new study involves acetaminophen, a pain reliever and fever reducer that serves as an active ingredient in over-the-counter medicines such as



Tylenol, Theraflu and other brands.

At all four wastewater treatment plants included in the project, the researchers found that acetaminophen concentrations in wastewater spiked before other measures of COVID-19 in the community in early 2021, including concentrations of COVID-19 viral RNA in wastewater, and the estimated number of confirmed COVID-19 cases.

For example, at the Bird Island Wastewater Treatment Plant, which serves Buffalo and some surrounding suburbs, acetaminophen levels in wastewater spiked about two weeks earlier than levels of SARS-CoV-2 RNA in wastewater. The spike in viral RNA, in turn, preceded the spike in the estimated number of confirmed cases of COVID-19 by about a week, scientists say.

"Our biggest finding is that there's a huge increase in the concentration of acetaminophen, which is used in over-the-counter drugs, that predates the peak of viral RNA in wastewater and the peak in clinical detections in our area during the study period," Aga says.

"This was very interesting, as it suggests that detection of pharmaceuticals could act as an early warning of a potential disease outbreak in a community," Aga says. "Our group is one of the first to complement detection of SARS-CoV-2

RNA in wastewater with the levels of pharmaceuticals."

Wastewater Data
Wastewater data is becoming a crucial part of monitoring COVID-19 as home testing has become more popular, leading to many positive cases going unreported.

During the pandemic, engineering researchers Ian M. Bradley and Yinyin Ye have been working with partners including Erie County to monitor COVID-19 viral RNA in wastewater.

The new study is exciting because it suggests that detection of pharmaceuticals could add another layer to such efforts, Bradley and Ye say. Their labs contributed data to the research, and they are co-authors of the paper.

Acetaminophen is not a perfect proxy for COVID-19. People take the drug to treat many types of pain, aches and fevers, and some fluctuations of the medicine in wastewater over the study period did not correlate with viral RNA data. However, the spike in acetaminophen that did seem to match up with the local COVID-19 wave was large and this finding points to use of over-the-counter medications as a potential early signal of a looming outbreak, the researchers say.

"What's really exciting is that there's so much information in wastewater. How can we use this to track diseases for public health? All of these data are complementary," says Bradley, assistant professor of civil, structural, and environmental engineering in the UB School of Engineering and Applied Sciences and a core faculty member in the UB RE-NEW Institute.

"We're focusing on wastewater public health studies, and we want to see if we can integrate more data to get an idea of what's going on in the community," says Ye, assistant professor of civil, structural, and environmental engineering, and RENEW faculty affiliate. "We can pull out information from wastewater but there are still a lot of unknown about how to interpret the data for public health. We want to test not just biological markers but also chemical markers and all sorts of different layers of information."

In addition to identifying the spikes in acetaminophen, the study found residues of prescription medications associated with the pandemic in wastewater, including drugs whose emergency use authorization for treating COVID-19 has been revoked by the US Food and Drug Administration.

Conspiracies A galore At Mughal Court

Salim got the third message and was not sure how to comply and go and meet Akbar. Agra fort was filled with enemies lurking around every corner. His own son Khusrav, his cousin Man Singh, his uncle Aziz Koka were all baying for his blood. Salim's wives did not want him to go to meet Akbar as they were not sure if he would be safe. So Jodha Bai aka Jagat Gosain decided to go to meet Akbar. Jodha Bai was third wife of Salim and his senior most wife after Man Bai's death, and his second wife. Jodha Bai was also Khurram aka Shah Jahan's mother. Khurram was given to Ruqaiyah Begam to be brought up by her, by Akbar when he was just a six day old baby.



Salim and Man Bai.

because Khusrav, who was being brought up by Akbar started calling Salim 'Shah Bhai' instead of respecting his father, and threw away his contention to the throne. When Man Bai told him to be loyal and respectful to Salim in a letter, he had refused to do so. Man Bai felt so dishonoured at his refusal that she drank wine mixed with opium and killed herself when Salim had gone hunting. Many powerful nobles sided with Khusrav but it was Aziz Koka, Abdul Rahim Khan-i-Khanan, Man Singh, Ali Quli etc. The mughal court was split wide open with all courtiers siding with one or the other camp.

Arbitrating

By now Akbar was getting impatient. He had called Salim to meet him on two consecutive days and seemingly Salim had ignored his summons. Akbar was anyway angry with Salim because of his revolt and killing of Abul Fazl etc. He had accepted Salim back at Agra fort only because of his mothers Salima and Ruqaiya etc had abjectly requested him. Further his own mother Hamida Bano had just died, her demise had left Akbar broken hearted. But the deep divide between father and son remained. Salim's enemies would lose no time to fuel hatred again in Akbar's heart saying that 'Salim had defied Akbar's orders on purpose and Salim thinks too much of himself' etc. By third day Akbar was furious with Salim for not visiting him although he had sent messages. By now entire Agra knew emperor was unwell, so Salim must have also known it, yet he did not go to meet Akbar. Akbar sent one last message

to Salim to meet him in his palace. Salim got the third message and was not sure how to comply and go and meet Akbar. Agra fort was filled with enemies lurking around every corner. His own son Khusrav, his cousin Man Singh, his uncle Aziz Koka were all baying for his blood. Salim's wives did not want him to go to meet Akbar as they were not sure if he would be safe. So Jodha Bai aka Jagat Gosain decided to go to meet Akbar. Jodha Bai was third wife of Salim and his senior most wife after Man Bai's death, and his second wife. Jodha Bai was also Khurram aka Shah Jahan's mother. Khurram was given to Ruqaiyah Begam to be brought up by her, by Akbar when he was just a six day old baby.



Ruqaiya Sultan Begum.



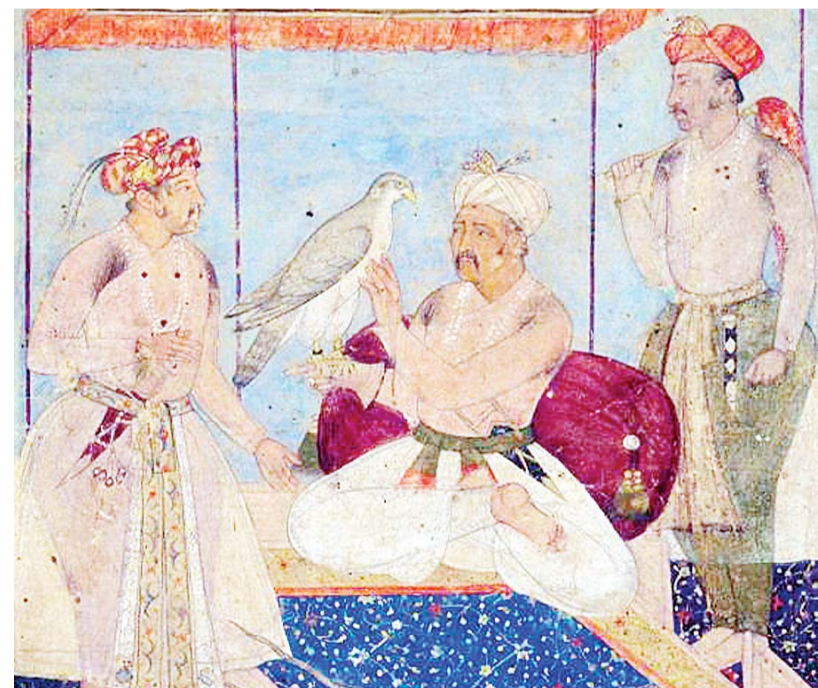
Raja Man Singh.

her maternal uncle by marriage to her aunt Ruknavathi. So there was no threat to her life from anyone as all those opposing Salim were her close relatives and would never harm her. Jodha Bai went to Akbar's palace and met Akbar and told him of Salim's predicament about meeting his father.

Elucidating

Salim also had enemies in his own house hold. His two servants had tried to assassinate him a few days back. Then they had tried running to south India to join Daniyal's camp but was caught. When Akbar heard from Jodha Bai the threat Salim faced, he understood the true reason for Salim's non compliance to his farmans. Jodha took a few of Salim's children with her and left for Salim's palace after visiting Akbar. But Khurram refused to leave Akbar and go with her to Salim's palace. Khusrav anyway

was shocked that his father had come to his palace to meet him at night. Akbar and Salim had talked to each other after many years, and sorted out their differences and misunderstandings. Akbar left in the morning back to his palace. Akbar called Man Singh, Abul Rahim and Aziz Koka, and ordered them to allow Salim into Agra Fort.



Akbar and Jehangir with falcon.



Man Bai's tomb.

#AKBARNAMA



Anjali Sharma Senior journalist & wildlife enthusiast

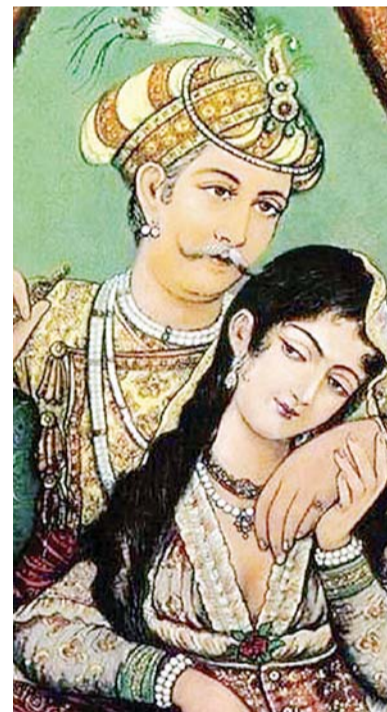
The Year was 1604, Akbar was now old and had started falling frequently unwell. Salim was back at Agra fort for good after his revolt against Akbar since 1599. Man Bai's suicide on 16th May 1604 had shaken Salim to the core. Man Bai was his first wife and cousin. She played an important role in handling Salim's household in his absence during wars and this finding points to use of over-the-counter medications as a potential early signal of a looming outbreak, the researchers say.

The Conspiracy

One day Akbar fell more than unusually unwell and wanted to speak to Salim urgently. He sent a message to Salim to meet him. Salim was in his palace with his wives and set out to meet Akbar in a boat on Yamuna. As he was approaching shore a rain of arrows descended on his boat. His boatman died and Salim had to row back his boat himself to his palace and thus could not meet Akbar. This was the second attack on his life after returning to Agra fort.

Next day Akbar again send him a message to come and meet him. This time Salim set out with body guards. Salim reached the shore and was about to walk towards Agra fort gate which was leading to Akbar's palace when an old courtier came running and told him to go back. He had an urgent message, that if he were to enter Agra fort he will not go back alive. A trap had been set to kill Salim as soon as he enters the fort. Salim again went back to his palace without meeting Akbar.

Salim was now worried, not only about his own safety but his children and mother's safety too. Some of his children like Khurram (Shah



Akbar and Ruqaiya.

Jahan) and Bahar, who were still in Agra fort harem with their grandparents as Salim was always out heading his army at war or squashing one or the other revolt since a very young age. He hardly stayed a few years with his family. He was mostly out of station from the young age of 9 years. So his children were more close to grandparents than to their parents. Most of his children considered Akbar as their father rather than Salim as he was the non absentee father in their life. Same way Ruqaiya and Mariam uz Zamani were more like mothers to Salim's kids than his own wives Jodha or Kamrasi etc. Since children were brought up in Akbar's household, it was not quite surprising.

The mughal court was split into three camps, one was Salim's camp, second was Daniyal's camp and third camp was Khusrav's camp. Man Bai had committed suicide

#MANKIND

A Prophet That Wasn't

At that moment, God was relaxing blissfully on Cloud Nine.



N.N. Sachitanand Senior Journalist

Once upon a time, not long ago, there lived a young man, who - if he had followed a linear life process - would have ultimately been trading in commodities from a comfortable chamber next to that of his merchant father. But like many potential prophets, the young man chose to think out of the box. And what he perceived of the state of human existence around him - the moralrot, the senseless violence, the pursuit of aggrandisement, the selfishness, the sorrows, the ghastly cruelty, the hypocrisy, the alienation, the fragmentation profoundly distressed him. He concluded that mankind was the path of self-destruction. Was there a way to

This one is for real. And he has come up with something. "Hummm! It seems I will have to go down and have a chat with him," decided the Supreme One and reluctantly clambered out of the wispy couch. The enlightened young man perceived Him as a vaporous mass of incandescence. "Lord, is that you?" he queried with rapturous incredulity. "Yes, son," boomed a voice from the radiance, or so it seemed, for he also heard an echo within his own mind. "I have found it, Lord," babbled the young man excitedly. "I have found the path to mankind's salvation. And it is so simple and straight forward that the most unlettered and poor person can easily follow it. "I know son, I have sensed it in your mind." "Please bless me then, O Glorious One, so that I can proceed to reveal the path to mankind and save it from perdition."

"Son, you have rightly concluded through your long period of cogitation that organized religion has alienated man from me and man from man, which in turn has led to the evils afflicting



stop this suicidal rush, he wondered. Like other seekers of yore, this youngster opted out of conventional life and left hearts and home for the wilderness so as to meditate without being disturbed and focus on coming up with asolution for mankind 'sills. Typically, his concentration was sought to be diluted by the celestials, first by arguments and threats, and then by blandishments and enticements. But our hero remained steadfast and unmoved. Years passed and then one day the knowledge that he sought dawned on him. An effulgence glowed around his emaciated face and he opened his eyes and smiled. At that moment, God was relaxing blissfully on Cloud Nine. His personal secretary materialized near him and broke his reverie by coughing. "What is it, Angel One?" asked the Lord. "It's another one of them, Lord," replied the Archangel. "Oh dear!" sighed the Supreme Being. "Have you tried the usual tricks with Mara and Maya?" "No dice, Lord,

humankind. You are proposing a new system in which this distancing is abolished and each individual enshrines me with in himself or herself as is his or her own priest and temple. This democratisation and decentralization of worship sans middlemen or ecclesiastical structures or rigid ritualism or hierarchy will you feel neutralize much of the dissatisfaction that debilitates humans and lead to a leap in goodwill among fellowmen." "Exactly, O Lord!" "It is an estimable idea but before you sailly forth on your mission, let me show you what will happen down the years and then you can decide what you want to do. "With that a video presentation flashed on in the young man's mind. He saw himself returning to the town, gathering together some of his friends, family and acquaintances and telling them about the new Truth. At first only a handful were willing to accept this logic and these few became dedicated to his cause

and teamed up with him as he went from village to village and town to town, propagating his message. He viewed them only as colleagues but soon they began to be characterized by others as his disciples and later the Inner Circle. He saw the popularity of his faith growing rapidly and the local ruler capitalizing on this to make it the new state religion, leading to conflicts with the followers of the established order. He saw the ruler waging wars to enforce the new faith in other regions and causing tremendous grief and anguish in the process. He saw his disciples make much of his death contrary to what he had propagated. He saw a huge edifice come up over his interred remains and his likeness in stone installed and worshipped as a deity.

He saw his disciples cloak his simple principles of self-worship with ritualism, complex prayers and theological mish-mash to make it dense to the common man. He saw them establish priestly orders, with rigid hierarchies to interpret what had by then become a complex religion. He saw the interpreters of his faith establish rigid codes of social conduct that divided man from man and left virtually no rights for women and the economically wretched. He saw the setting up of congregation centres for the faithful which soon turned to centres of power and corruption for the priesthood. The unfolding scenario scrolled through the centuries and he saw the controllers of the new faith gathering immense power, enough to even challenge the might of state power and interfere constantly inlay governance.

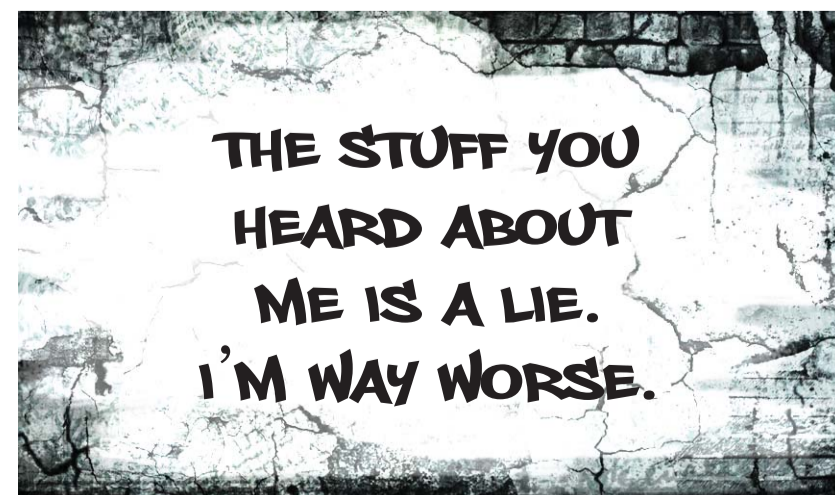
He saw the lure of this power split the faith into different factions which fought each other ferociously. He saw the followers of his faith commit unheard of atrocities on the followers of other faiths in myriad and constant struggles for so called supremacy down the ages. He saw that the faith that he started to rescue mankind from the sorrows and evils perpetrated by established religions has itself become a member of the wolf

pack. "Stop! Stop!" screamed the young man in high agitation. "This is not what I wished to cause when I came up with my solution to the world's ills. "I am afraid son, that is precisely what the slave, the prince, the carpenter's son, the camel herder and others before you envisaged when they came up with their solutions. But look what mankind has gone through and is enduring because of their good intentions." The young man thought for a long time, then gathered his tattered clothes around him, walked slowly out of the forest and back to his ancestral house in the town. There he announced to his relieved father, "I think I will take you up on the job offer. But first, I need a bath." Back in Heaven, the Lord settled back on to his cloud couch with a sigh and remarked to Angel One, "Saving humanity from its evils is becoming an increasingly tough task."



By Jerry Scott & Jim Borgman

THE WALL



BABY BLUES



By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman