

#EGGSTRAORDINARY

This 1,700-Year-Old Egg Never Broke

Archaeologists still can't fully crack the mystery



About 50 miles northwest of London sits a very old wishing well. Romans used to toss objects into the water here, offering items to the gods for 'good luck.' Nearly 2,000 years later, archaeologists are still finding ancient artifacts from what is now a large, muddy pit, including coins, ceramic pots, shoes, and even bones from between 270 and 300 AD.

The site is called *Berryfields*, which has an Iron Age Roman settlement along its southern edge and medieval earthworks are visible in the northeast section. The area was charitably excavated between 2007 and 2016 by Oxford Archaeology, and results of the field work revealed nearly two millennia of fascinating 'human activity.'

A team of researchers from the United Kingdom believes that the Romans originally used to extract water for brewing ale, and later transformed the well into a place of ritual. However, in addition to the many objects uncovered from the depths, one item has baffled scientists today: a 1,700-year-old egg that is completely intact. The egg was found some years ago, but more recently, scientists made another discovery about it. A Micro-CT scan showed that this ancient egg is still full of liquid. "Organic materials and liquids do not normally survive the depths of time unless in special circumstances," said conservator Dana Goodburn-Brown.

"Anaerobic conditions at the site preserved the eggs in situ." The egg was found among three other broken shells, serving as the first evidence of Roman habitation in what is now 'Britain.' This rare artifact is the oldest example of an *unintentionally preserved avian egg* in existence. It has survived since the third century. Thanks to the environment within the pit! The clay composition of the waterlogged soil prevented oxygen from circulating around the egg, creating a protective cocoon, resistant to decomposition.

In addition to an air bubble, the insides are presumably derived from the yolk and albumen. However, it's unclear what exactly remains in the egg or if it was ever fertilized. In addition to imaging, there are a range of molecular and chemical investigative techniques, alongside comparisons with similar collections, that can help determine what's inside. But ultimately, the egg will need to be pierced to remove its contents for a full analysis.

"Researchers are planning to carefully extract the liquid to better study it," stated Edward Bidulph, Senior Project Manager, who oversaw the site excavation. "It's a controlled process similar to egg blowing, where a tiny hole is made in its shell after creating a 3D model."

Scientists are eager to use DNA testing to establish the species that laid the egg.

This information has potential to divulge important archaeological insights into the culture of ancient Romans, particularly their ritual deposition and animal introductions.

"Normally, we find eggs broken, fragments of shell, sometimes alongside the nail, itself, that ceremonially broke the egg. So, to find one whole is not just unusual in the sense of preservation, but also for having never been broken in the first place," said Steven Ellis, a Roman archaeologist.



A silver lining in the dark clouds of sports injuries



It is also worth debating that not every sportsman, (also including those who have earned a name for themselves in their chosen sports careers) could be as fortunate as Kapil or Sachin was, in case when an injury afflicts him and nips in the bud his career at threshold level.

By Gyan Bhadra

In 1961-62, during a cricket match between India and West Indies, a body-line delivery from West Indies' pacer, Charlie Griffith hit Indian batsman, Nari Contractor, on his head. He fell on the ground with blood oozing out. He remained unconscious for six consecutive days, though, he made a remarkable recovery. Later, he was never again picked to play for his country.

In 1979-80, *fast-medium bowling all-rounder*, Kapil Dev, suffered from serious knee injury. He needed money to go to England for treatment of his injured knee. It is worth remembering that at that point of time, there was not much money in the 'gentleman's game.' Kapil was also not born with a silver spoon either.



Sally Pearson, Australian hurdler, needs surgery but not amputation.

However, God was kind to him. Veteran film actor, Pran, disguised as a *good samaritan*, sponsored Kapil Dev's treatment in England. It was akin to 'Godsend help' for Kapil Dev, who was gaining rapid strides in International Cricket.

In 2004, unforgettable batting legend, Sachin Tendulkar, fell prey to the career-threatening injury 'Tennis Elbow.' In London, he went under surgeon's knives and scalpels before donning the robes of a batsman again.

It goes without saying that these are instances of 'sports-related injuries.' They do not ask, just come calling to sportsmen. They catch them, unaware, at any point of time in their careers. In this context, it is also worth debating that not every sportsman (also including those who have earned a name for themselves in their chosen sports careers) could be as fortunate as Kapil or Sachin was, in case when an injury afflicts him

#SPORT WORTS



Nari Contractor, hit by ball.

and nips in the bud his career at threshold level. And as a recent instance, Sally Pearson, an athlete from Australia, withdrew herself from 100 meters hurdles in ongoing 2018 Commonwealth Games, due to severe 'Achilles Tendon' injury. Earlier in Rio Olympic in 2016, she suffered from 'hamstring injury.' What is more, Sushil Kumar, wrestler, injured his knee, during national selection trials for Asian Championship and 2018 Commonwealth Games.

Especially for sons of lesser Gods, who are struggling at urban, district or state-level to make 'a mark' in the sports of their own choosing, the lack of 'necessary treatment facilities' for sports-related injuries, need 'specialised recovery' in order to elicit quick response for players. In this regard, *sports injury clinics* could only serve the player's purposes. On this score, the role of general

orthopaedic surgeon is limited. Similar sentiments were also echoed by eminent Hockey Olympian, Gundeeep Kumar, as he says, "Informative sports portals and sports injury clinics were few and far between, when I suffered from severe back pain, during the period of selection for Indian men's hockey team at national level in 1990."

"At that time, it seemed as if all hell broke loose for me. As I travel down the memory lanes of that period, I feel indebted to Dr. Cruz, an army doctor, whose untiring efforts to get me well and fit, paved the way for me to enter the Indian team," he recalls, misty-eyed. As he revisits emotions that churned out within him, during that period, he ruefully says that treatment facilities for sports-related injuries were meager, even in metros and big cities. And what was being added, in the form of insult to injury for players then, was that if a player got

injured during a practice session at camp, he was at once sent back home. Admittedly, things have now improved to a great extent. "Nowadays, if a player hurts himself at the camp, he is rehabilitated and not asked to return," he says, in a matter-of-factly manner.

It is noteworthy that *sports injury clinics*, in large numbers, are helping injured players with specialized treatment. However, semi-urban or rural areas still lack this much-needed facility.

"More so at school level, players are bereft of this facility. Without exaggeration, I must appreciate my friend and player, Shrikant, who is doing magnificent job relating to sports injury in Delhi. I am of the opinion that any effort, be it sports clinic or sports-related information portal, pioneered by ex-players must be appreciated and given its due," he avers.

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Pink Day

Bullying is a growing problem in the world today and, every year, people hear of more and more incidents coming up regarding bullying in schools, everywhere. Bullying is unpredictable and it doesn't tend to follow any kind of rhyme or reason. It is merely the exertion of power over those who are weaker or who stand out as unusual. *Pink Days* is a day dedicated to beating the 'bullies' and breaking the 'cycle' that creates and perpetuates this damaging behaviour, inside and outside of schools.



Sachin Tendulkar in hospital after surgery.



Jayant Lakhera.

Sushil Kumar.

#EVOLUTION

Do bat 'nightclubs' hold the secret to stopping the next Pandemic?

"You can think of swarming behaviour like a social gathering. For bats, it is like going to a club."

Some species of bats are protected against the viruses that they carry because they commonly exchange 'immune genes' during seasonal mating swarms, researchers report. Bats carry some of the deadliest 'zoonotic diseases' that can infect both humans and animals, such as Ebola and COVID-19. The finding of a new study in the journal 'Cell Genomics' could help scientists prevent future pandemics.

"Understanding how bats have evolved 'viral tolerance' may help us learn how humans can better fight emerging diseases," says Nicole Foley from the Texas A&M School of Veterinary Medicine and Biomedical Sciences (VMBS). "As genomicists, our work often lays the groundwork for research by scientists, who study 'virus transmission' directly. They may be developing vaccines for diseases or monitoring vulnerable animal populations. We all depend on each other to stay ahead of the next pandemic."

Because bats are often immune to the diseases they carry, Foley and Bill Murphy, a professor in the VMBS' Veterinary Integrative Biosciences department, believe that studying 'bats' disease immunity' could hold the key to preventing the next global pandemic.

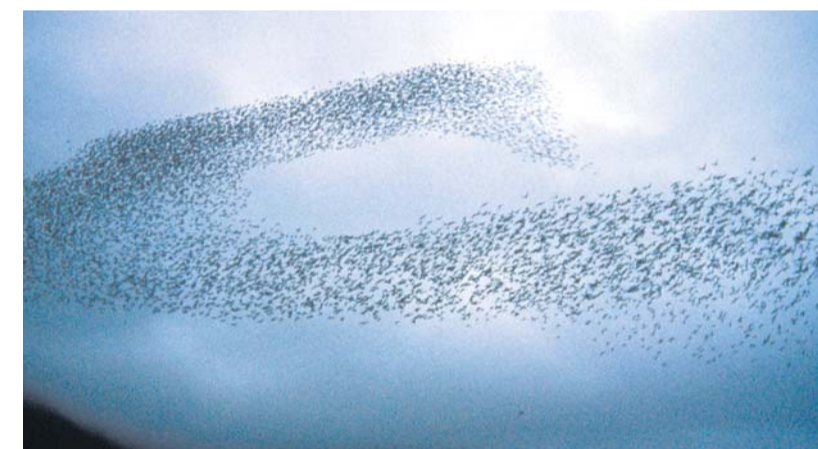
"Because of the COVID-19 pandemic, the prediction and prevention of outbreaks is front of mind for researchers and the public alike," Foley says. "Several bat species are tolerant of viruses that are detrimental to human health, which means they become reservoirs for disease. They carry the viruses, but crucially, they don't develop symptoms."

To uncover exactly 'how bats have evolved tolerance to these deadly viruses,' Foley, Murphy, and colleagues mapped the evolutionary tree of *Myotis bats*, something they knew to be crucial, in trying to identify which genes might be involved.

"Myotis bats are the second-largest genus of mammals, with over 140 species," Foley says. "They're found almost all over the world and they host a large diversity of viruses."

To add to the difficulties associated with figuring out relationships among species, *Myotis* and other bat species also engage in *swarming behaviour* during mating.

"You can think of swarming



behaviour like a social gathering, there's lots of flight activity, increased communication, and inter-species mingling, for bats. It's not unlike going to a club," Foley says.

Complicating things for the researchers, swarming creates increased numbers of *hybrids*, 'individual bats with parents from different species.'

"The problem with *Myotis bats* is that there are so many species, about 130, but they all look very similar," Foley says. "It can be very hard to distinguish them from each other, and then hybridization makes it even more difficult. If we're trying to map out how these bats evolved, so that we can understand their disease immunity, being able to tell who's who is very important."

With this in mind, to create a map of the true relationships

between *Myotis bats*, Foley and Murphy first untangled the genetic code for 'hybridization,' so that they could tell more clearly 'which species' were 'which.'

"We collaborated with researchers from Ireland, France, and Switzerland to sequence the genomes of 60 *Myotis bat* species," she says. "That allowed us to figure out which parts of the DNA represented the species' true evolutionary history and which parts arose from hybridization."

With that part of the puzzle solved, the researchers were finally able to examine the genetic code more closely to see how it might shed light on 'disease immunity.'

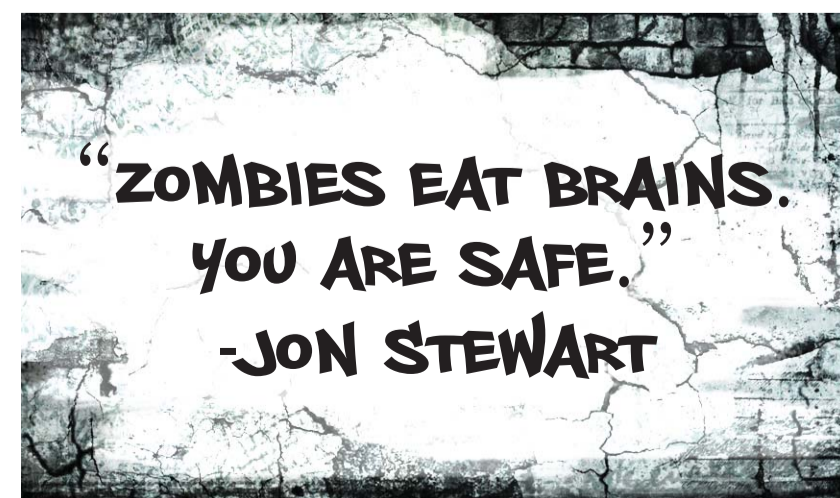
They found that *immune genes* were some of those 'most frequently exchanged' between species while swarming.

"Swarming behaviour has always been a bit of a mystery for researchers," Foley says. "Now, we have a better understanding of why this particular behaviour evolved. Perhaps, to promote hybridization, which helps spread beneficial immune gene variants more widely throughout the population."

The findings have opened the doors to new questions about the importance of 'hybridization' in evolution. "Hybridization played a much bigger role in our findings than we anticipated," Foley says. "These results have led us to wonder to what extent hybridization has obscured genomicists' knowledge of mammalian evolutionary history, so far. Now, we're hoping to identify other instances where hybridization has occurred among mammals and see what we can learn about how they are related and even, how and why genomes are organized the way that they are," she says.



THE WALL



BABY BLUES



By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman