

Physicists doubt that 'corking' could help baseball's big hitter

Geoff Brumfiel, Washington

Baseball fans are starting to question Chicago Cubs superstar Sammy Sosa's impressive hitting record, in the light of his use of an illegal 'corked' bat to boost his slugging power. But physicists say that the bat did little, if anything, to improve his hitting.

Sosa, who has hit 505 home runs, was caught in the act when his bat shattered in a game on 3 June against the Tampa Bay Devil Rays. He denies intentionally using the bat in the game — he claims he uses it to impress fans during practice — but was suspended for eight games.

Physicists say, however, that Sosa gained almost no advantage by using the bat, which was hollowed and filled with a small amount of cork. Using a lighter bat would help Sosa swing harder but would actually lessen the energy transferred to the ball, according to Alan Nathan of the University of Illinois at Urbana-Champaign, who recently studied ball-bat impacts (*Am. J. Phys.* 71, 134–144; 2003). "If there is a net advantage, it would be small enough that it wouldn't be worth writing home about," Nathan says.

Robert Adair, a professor emeritus at Yale University and former official physicist of Major League Baseball, agrees that the perceived advantage of corking a bat is largely "superstition". It is deemed illegal because traditionally bats are supposed to be solid wood. "Corked bats aren't a mortal sin," he says. "Maybe just a venial one." ■

Prairie-dog model offers hope of tackling monkeypox virus

Jonathan Knight, San Francisco

A leading poxvirus expert says he envisages a new line of attack for biologists studying the monkeypox virus in the current outbreak in the midwestern United States.

Mark Buller of Saint Louis University in Missouri says he will try to develop a laboratory model for monkeypox infection using prairie dogs, common rodents that seem to be capable of transmitting the virus.

Until this month, monkeypox — a milder cousin of smallpox — had been seen only in parts of west Africa, where it is endemic in wild rodent populations that are sometimes hunted for food. Now 33 people in Wisconsin, Illinois and Indiana have contracted the disease from pet prairie dogs. The virus is thought to have arrived in a Gambian giant rat, which was imported as part of the growing trade in exotic pets.

"We know nothing about the natural biology of monkeypox at all," Buller says. Research has been limited in part because the disease is rare in humans, but also because there is no good animal model.

Among the animals infected experimentally with monkeypox is the cotton rat, a shoe-sized rodent found in Mexico and the southern United States. These animals succumb quickly to an injection of virus and are useful for testing antiviral drugs and for studying the virus's lethal effects.

But Buller says that a natural host would be much better for studying basic questions about monkeypox, such as how it is transmitted, what cells it infects, what genes control its virulence, and how the host responds.



Prairie dogs can transmit monkeypox and are already used to study some infectious diseases.

"You could get a natural profile of the disease," he says.

Buller hasn't ruled out trying the Gambian giant rat, but many animals fare poorly in captivity, and setting up a new laboratory colony of an untried rodent species is fraught with complications. "Some animals turn out to be more trouble than they are worth," he says. Prairie dogs, on the other hand, handle captivity quite well, and are already being used in a number of laboratories studying infectious disease.

Other poxvirus researchers are eager to see Buller's efforts succeed. Donald Smee, a virologist at Utah State University in Logan, would like to test his hypothesis that drug-resistant monkeypox viruses are also less deadly, but has not yet found an animal model in which to do this. Prairie dogs may work if the virus proves lethal to them in the first place, he says. ■

Pumping row erodes hopes for underground lab

Geoff Brumfiel, Washington

Plans to build an underground physics laboratory in an abandoned gold-mine in South Dakota are close to collapse this week amidst quarrelling between its advocates, the National Science Foundation (NSF), and its owner, mining company Barrick Gold.

Barrick says it will now allow the Homestake mine near Lead to begin filling with water, claiming that it was shut out of an NSF panel charged with determining the best conditions for a deep underground laboratory (see *Nature* 423, 578; 2003). A meeting on 9 June between company officials and South Dakota's congressional delegation failed to persuade the company to reverse its decision.

Congressional sources say that Barrick was displeased with the NSF panel report,

released last month, that endorsed Homestake as the best site for the lab. The report warned that if Homestake filled with water, which flows naturally into the mine at a rate of several hundred gallons per minute, this could substantially raise the cost. The panel said it was "unanimous in the opinion that continuing to pump is the most desirable option".

A spokesman for Barrick, which has been under a court order to spend about \$250,000 a month to pump out the mine, denied that the company was angry at the recommendation. But the spokesman, Vince Borg, did say that the company was not allowed to present its case to the NSF panel. "We had up-to-date, accurate, current information we wanted to share with them," he says. "We

didn't understand the decision of the panel."

Within three days of the report's release on 30 May, Barrick announced that it would let the mine flood. This move triggered a letter from many leading physicists, including Stephen Hawking of Cambridge University, urging Barrick to keep pumping.

Some in Congress see the mine as a boon to Barrick and a blight to the federal government. Under a 2001 law, the government must assume all environmental liability for the mine if a laboratory is built there.

But Alfred Mann, a physicist emeritus at the University of Pennsylvania in Philadelphia, is still hopeful that an agreement can be worked out. "This lab would be one of the most important underground laboratories in the world," he says. ■