

► Germany, who won the medicine prize in 1991. “But I don’t think this discredits the Nobel prize — they are two different things.”

When Alfred Nobel died in 1896, he left the bulk of his fortune — amassed from his explosives businesses — to the Nobel prizes. His will specified which institutions would select each prize, and declared the KI in charge of medicine. The first prizes were awarded in 1901.

At first, the entire KI faculty selected the medicine winners, but by the 1970s it had grown too large for this to be practical — and a new law made all documents at state institutions accessible to the public, ruling out secret deliberations. So in 1977, the Nobel Assembly was created, comprising 50 KI professors; the Nobel Foundation pays for its operations.

The Nobel Committee has also done a good job of separating itself from the Macchiarini affair since it began, says neuroscientist Eero Castrén at the University of Helsinki. KI geneticist Urban Lendahl, who participated in the decision to hire Macchiarini, resigned his position as secretary-general of the Nobel Committee in February, notes Castrén. (Lendahl

stepped down because he anticipated that he would be involved in the investigation.)

Two other assembly members — clinical immunologist Katarina Le Blanc, who co-authored a paper with Macchiarini that is under investigation by the Central Ethical Review Board, and Hans-Gustaf Ljunggren, who was dean of research at the KI from 2013 until February — have not been asked to resign because there is still “uncertainty over their roles” in the Macchiarini affair, says Perlmann.

“To protect the brand”, he adds, none of the three, nor Wallberg-Henriksson, nor Hamsten, has participated in assembly activities since February. Perlmann says that the Nobel Committee is not taking further action, but will monitor perceptions of the prize to see whether it needs to do more.

“It is important that institutions deal in a fair way with those whose judgement or moral probity has been called into question,” says Steven Hyman, director of the Stanley Center for Psychiatric Research at the Broad Institute in Boston, Massachusetts, who has nominated prize candidates to the Nobel Committee. “The

Nobel Assembly seems to be doing this.”

He adds: “There is no benefit to the world, or to patients who have been harmed, by using a very serious incident to undercut a globally important institute.”

The assembly has survived other challenges, usually relating to complaints about its choices. In 1994, it encountered accusations — quickly discredited — that it had allowed a drug company to buy the 1986 medicine prize for Italian neuroscientist Rita Levi-Montalcini.

Just as the Swedish king never comments on politics, the Nobel Assembly never comments on such complaints. But during its 100th anniversary celebrations, it acknowledged some regrets — such as awarding a share of the 1923 prize for the discovery of insulin to John Macleod, whose role is now questioned, and the failure to recognize Oswald Avery, who identified DNA as the genetic material in the 1940s.

“The prize has survived many things,” says cell biologist Måns Ehrenberg of Uppsala University, who has served on the committee that selects the Nobel Prize in Chemistry. “The standard of evaluation no one can criticize.” ■

BIOLOGY

DNA reveals four giraffe species

Finding could guide efforts to conserve the iconic animals.

BY CHRIS WOOLSTON

One of the most iconic African animals has a secret. A genetic analysis suggests that the giraffe is not one species, but four — a finding that could alter how conservationists protect the animals.

Researchers previously split giraffes into several subspecies on the basis of their coat patterns and where they lived. Closer inspection of their genes, however, reveals that giraffes should actually be divided into four distinct lineages that don’t interbreed in the wild, scientists reported on 8 September in *Current Biology*¹. Previous genetic studies² have found discrete giraffe populations that rarely intermingled, but this is the first to detect species-level differences, says lead author Axel Janke, a geneticist at Goethe University in Frankfurt, Germany.

“It was an amazing finding,” he says. He notes that giraffes are highly mobile, wide-ranging animals that would have many

chances to interbreed in the wild, if they were so inclined. “The million-dollar question is what kept them apart in the past.” Janke speculates that rivers or other physical barriers kept populations separate long enough for new species to arise.

RUMINATING ON RUMINANTS

The study tracked the distribution of 7 specific gene sequences — chosen to measure genetic diversity — in nuclear DNA from skin biopsies of 190 giraffes. It also analysed the animals’ mitochondrial DNA. The sequences fell into four distinct patterns that strongly suggested separate species. Janke says that the four species are about as different from each other as the brown bear

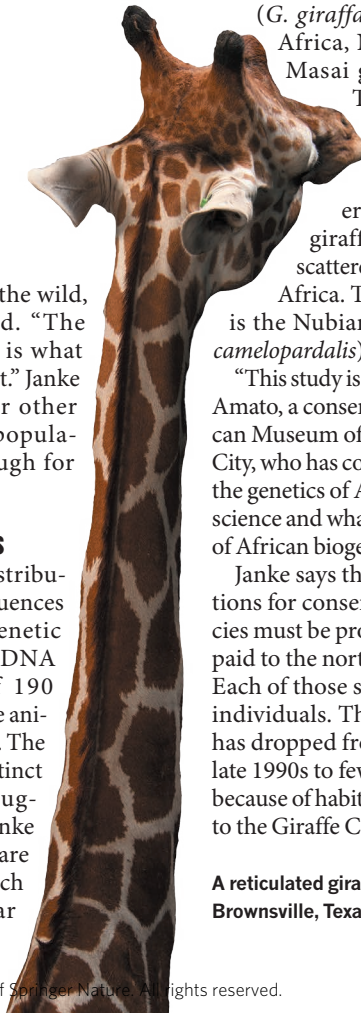
(*Ursus arctos*) is from the polar bear (*Ursus maritimus*).

The researchers suggest replacing the current species name, *Giraffa camelopardalis*, with four new ones: the southern giraffe (*G. giraffa*), found throughout South Africa, Namibia and Botswana; the Masai giraffe (*G. tippelskirchi*) of Tanzania, Kenya and Zambia; the reticulated giraffe (*G. reticulata*) found in Kenya, Somalia and southern Ethiopia; and the northern giraffe (*G. camelopardalis*), found scattered through central and eastern Africa. The one remaining subspecies is the Nubian giraffe (*G. camelopardalis camelopardalis*) of Ethiopia and South Sudan.

“This study is pretty persuasive,” says George Amato, a conservation biologist at the American Museum of Natural History in New York City, who has conducted extensive research on the genetics of African wildlife. “I applaud the science and what it adds to our understanding of African biogeography.”

Janke says that the findings have implications for conservation: all of the giraffe species must be protected, with special attention paid to the northern and reticulated giraffes. Each of those species has fewer than 10,000 individuals. The overall number of giraffes has dropped from more than 140,000 in the late 1990s to fewer than 80,000 today, largely because of habitat loss and hunting, according to the Giraffe Conservation Foundation.

A reticulated giraffe at the Gladys Porter Zoo in Brownsville, Texas.



JOEL SARTORE/NGC/GETTY

But applying the findings to conservation efforts may be difficult, because it's not always obvious how that knowledge should guide decisions about animal protection. "So far, we haven't really been able to fully appreciate the power of genomics in conservation," says Aaron Shafer, a geneticist at Trent University in Peterborough, Canada.

FINDING CLARITY

Amato notes strong parallels between giraffes and African elephants, which were classified as a single species until a 2010 study³ provided genetic evidence that there were actually two: forest elephants (*Loxodonta cyclotis*) and savannah elephants (*Loxodonta africana*). That finding increased calls for extra protection of the forest elephant, the rarer of the two.

However, assessments by the International Union for Conservation of Nature still treat the animals as one species, owing to concerns that splitting them into two would place elephant hybrids into a kind of conservation limbo.

Evidence showing that many populations of American bison (*Bison bison*) carry a little domestic-cattle DNA⁴ prompted concerns over whether it was worth saving the contaminated herds, because they weren't completely wild. Amato and other biologists have argued that the animals still deserve protection. "They are ecologically functional bison," he says.

It is unclear whether this study will have any impact on giraffe conservation, says Amato. The most immediate effects may be felt in zoos that trade the mammals for breeding purposes: now that researchers have identified several species, it should be easier for zookeepers to make appropriate matches.

The discovery of these giraffe species could have come sooner, but science has neglected the animals. "Giraffes were fairly ubiquitous in their habitat, and they weren't much of a target for poachers," Amato says. "They are an iconic animal, but they were taken for granted." ■

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2. Brown, D. M. *et al. BMC Biol.* **5**, 57 (2007).
3. Rohland, N. *et al. PLoS Biol.* **8**, e1000564 (2010).
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Studies of people who survived Ebola are altering scientists' understanding of the virus.

PUBLIC HEALTH

Ebola virus and its legacy linger on

Long-term tracking of people who beat the virus reveals its remarkable longevity in the human body.

BY ERIKA CHECK HAYDEN

Ebola survivors are teaching scientists some surprising lessons. Long-term studies have revealed that the virus lasts longer in survivors' bodies than previously suspected.

The findings, presented on 12 September at an Ebola-virus conference in Antwerp, Belgium, underscore the need for extended tracking of people who have beaten Ebola and other rare infections. Researchers have long known that the virus can persist in people who have recovered from the infection. But the size of the West African outbreak, coupled with improved monitoring technologies, is changing how scientists view life after Ebola — and how to prevent future outbreaks.

"Now that you have tens of thousands of survivors and systemic approaches to follow them, you can detect things that happen more rarely and attribute them to Ebola," says physician and epidemiologist Daniel Bausch of the World Health Organization in Geneva, Switzerland.

Researchers will soon publish the first confirmed report of a person without obvious Ebola symptoms infecting another person. A seemingly healthy mother in Guinea passed the virus to her nine-month-old daughter in breast milk, and the child died from Ebola-virus infection in August 2015, according to a European Union-funded team led by Sophie Duraffour from the Bernhard Nocht Institute for Tropical Medicine in Hamburg, Germany.

A study due to be presented at the Antwerp meeting also suggests that some people ▶



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