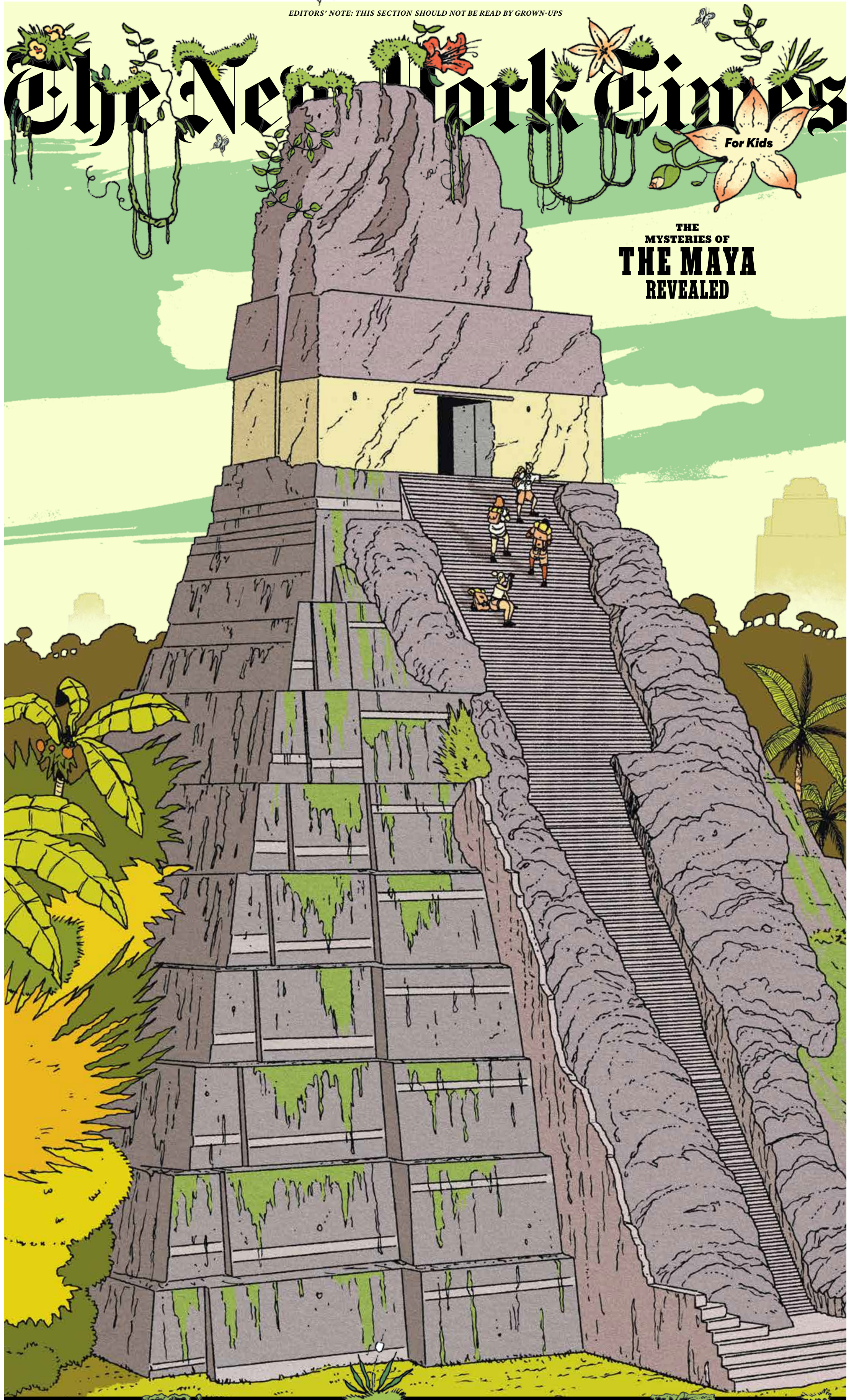


EDITORS' NOTE: THIS SECTION SHOULD NOT BE READ BY GROWN-UPS



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Science



A HUGE DISCOVERY OF ANCIENT

MAYA TREASURES

BY TOM CLYNES



Guillermo de Anda, an archaeologist, inside a Mexican cave called Balamkú, with some of the Maya artifacts he found there.

THE ARCHAEOLOGIST Guillermo de Anda had some good luck a few months ago. He was searching for a sacred well beneath the ancient Maya city of Chichén Itzá, in Mexico, when a farmer named Luis Un offered to lead him to a cave that might have some old pottery inside. Un, now 68, remembered that an archaeologist visited it in the 1960s, but he didn't excavate it. Instead, he asked Un and his neighbors to seal the entrance, and the contents remained undisturbed. De Anda, who studies the ancient Maya — indigenous Mesoamericans who lived in Mexico, Guatemala and Belize — was curious and decided to go see. But getting to the possible treasures deep inside Balamkú ("the Cave of the Jaguar God") wasn't easy. De Anda had to crawl on his stomach and squeeze through tight passageways for hours. At one point a venomous coral snake blocked his path. "It seemed like the snake

was guarding the treasure," he says. He turned back, and returned the next day, only to find the snake in the same place. "After three days a local shaman" — a traditional healer and spiritual guide — "told me that the snake was giving me permission to go inside, that I didn't need to be afraid," de Anda says. "But I was still afraid when I went back the fourth time. Luckily, the snake didn't strike; it just watched me as I passed." After about 1,500 feet the tunnel opened into the first of several spacious chambers, and de Anda's headlamp lit up something spectacular: a treasure trove of sacred artifacts! The rooms were filled with ceramic incense burners, water carriers and dozens of other items that Maya worshipers probably used as part of a religious ceremony more than 1,000 years ago. "I cried when I realized what I'd found," de Anda says. "It was like traveling back in time."

Why did the ancients leave these things deep inside Balamkú? The Maya thought of caves as openings to the underworld. De Anda, who announced the findings last month, thinks they may have come to the cave during a severe drought to leave gifts that would persuade the gods to send rain. In the past, archaeologists might have moved these artifacts to museums, but de Anda's team will leave them in the cave. Because the objects have not been touched, the researchers have a rare opportunity to study them in their original setting. More research will help them better understand the ancient rituals and culture — and may even help to solve the mystery of why the residents of Chichén Itzá abandoned their great city hundreds of years ago. *For more on the rise and fall of the Maya, turn the page!*



IT'S A BIRD! IT'S A PLANE! IT'S IMMUNITY!

BY CHELSEA LEU · ILLUSTRATION BY GIACOMO GAMBINERI



HUMANS ARE walking incubators. In our warm, nutrient-filled bodies, bad bacteria and viruses can quickly grow. And as we sneeze or cough, we can spew those germs around, infecting other people. Take the measles virus, which can stay alive on a table or other object for two hours. Earlier this year in Brooklyn, one student who had measles infected at least 21 other people. The outbreak became so bad that on April 9, New York declared a public health emergency. As you can guess from the vaccines article on the National page, those people probably hadn't received the measles shot. A shot is the best way to protect yourself from catching contagious-but-preventable diseases. And it's not just important for you: It protects your community. Doctors call that effect herd immunity, and it's especially helpful for people whose immune systems are too weak for them to be vaccinated.

That group includes babies, elderly people and those who are being treated for serious conditions like cancer.

How herd immunity works:

1. You get a shot — say, for measles or the chickenpox. Congratulations! You're much less likely to get sick from that disease. That's because the shot is filled with tiny pieces of the virus or bacteria that trigger your body to build up germ-fighting antibodies. Now you have an immunity shield if you encounter the virus or bacteria in the future.
2. If you're protected, that means the people you spend time with are also less likely to be infected, because you won't pass the disease along to them.
3. If the people you spend time with also become vaccinated against that

disease, the people they spend time with will be less likely to contract it as well. It's an awesome chain reaction. If enough people in a certain area — a school, a city or even a country — are immunized, it's much harder for diseases to make people sick, spread uncontrollably or cause deaths.

4. To keep diseases from being passed along from person to person, a certain percentage of the people in an area (the "herd") need to be vaccinated. That percentage depends on how easily the illness spreads. For a highly contagious disease like measles, for instance, 93 to 95 percent of people need to be vaccinated to prevent the disease from spreading. If fewer than 93 percent of people are vaccinated, people will continue catching measles from one another.

5. If enough people are vaccinated against a contagious disease for a certain amount of time, it can simply disappear. Several illnesses have been eliminated from the United States this way, including polio, rubella and measles. (The recent measles cases began when someone traveled abroad, caught the virus and then came back to the United States — which is why it's important to receive immunizations even for diseases people haven't had in a while. There's always a chance they could be reintroduced.)

6. If herd immunity is widespread enough, diseases can even vanish from the entire world. In 1980, health workers around the globe managed to completely get rid of the deadly disease smallpox — the first and only disease eradicated with the help of vaccines. ♦

TEXTING WITH A SCIENTIST

PENGUINS HIDING IN PLAIN SIGHT

BY MOLLY BENNET

WHAT'S BLACK and white and pink all over? Adélie penguins and their poop! We texted with Heather Lynch, an ecologist at Stony Brook University in New York, about how she tracks penguins from space using their bright pink poop. Recently, Lynch and her colleagues announced that they had discovered several gigantic groups of penguins that nobody even knew existed. That was something we had to hear more about. An edited and condensed version of our conversation follows.

Can you tell me about your work, using only emoji?

Molly



Heather

🐧 I think I'm going to need you to translate that for me!

Sure thing! In a nutshell: My students and I fly to Argentina and then take a boat to Antarctica to survey penguins. Over the course of a four-month field season, we'll count (hence the abacus) lots and lots of penguins. The rest of the year, we use satellites to track penguin populations by measuring the size of the guano (poop) stain they leave behind at the colony. Sometimes we even discover new colonies in satellite imagery!

What's the most exciting discovery you've made?

The Danger Islands, by a mile! We found several huge colonies of Adélie penguins with satellites, and we put together a field expedition shortly thereafter. All in all, the Danger Islands contain about 1.5 million penguins.

But do they really poop so much you can see it from space?

Indeed! Even just a couple of pairs of 🐧 can produce enough 💩 to be seen from space. It helps that it's bright pink and that the Antarctic is otherwise largely gray and white.

Pink? Why?



Penguins eat krill, which look a lot like shrimp. The pink shells of the krill are ground up and pooped out as a pink slime. Lucky for us, the size of the guano stain tells us how many penguins there are.

What's next for your Danger Islands research?

Now that we know what is there, we can keep a good eye on them with satellites. There are several other penguin hot spots on our wish list for the coming years, so I'm keeping my fingers crossed that we can find the 💩 and a good solid 🐧 to check them out.

O.K., last question! After spending all this time dealing with smelly pink guano, do you still ❤️ penguins?

I still ❤️ penguins, and I don't think I'll ever get tired of discovering new things — it's the best part of being a scientist. Even if I have to wade through 💩 to do it. :)