

begin an investigation. “There’s a delicate balance between receiving complaints and the due process people are entitled to,” says Córdova. “An actual finding of determination is something concrete we can take action on.”

Roughly 2,000 universities and other research institutions receive NSF funding. They are already legally responsible for complying with federal civil-rights laws — including the Title IX legislation that bars discrimination on the basis of sex, which has been widely used to battle sexual harassment and assault on campus. Many people do not report harassment through their home institutions, however, because they fear retaliation or assume that an investigation will not be thorough, Marín-Spiotta notes. The NSF’s new policy allows people to report harassment directly to the agency in addition to, or rather than, going through an institution.

Since it first proposed the reporting rule in February, the NSF has received “five or six” notifications from institutions of findings involving harassment by grant recipients, and “probably at least twice that” number of notifications from individuals who have encountered or witnessed harassment involving grantees, says Robert Cosgrove, a compliance programme manager at the NSF.

Reports of harassment involving NSF grantees can be filed online at <https://nsf.gov/harassment>. Rhonda Davis, head of the NSF Office of Diversity and Inclusion, says she has added several staff members who are experienced in dealing with harassment to work on the reports.

Asked explicitly about bullying, Córdova noted that it is covered under “other forms of harassment” in the NSF rule.

BROADER ACTION

The push to deal with harassment in science continues to expand. On 15 September, the governing council of the American Association for the Advancement of Science in Washington DC voted to establish procedures to revoke fellowship honours for scientists found to have committed misconduct or ethical breaches, including harassment. And Congress has asked the US Government Accountability Office to open an investigation into how the various government funding agencies deal with sexual harassment involving their grantees.

Córdova says that the NSF and other agencies are waiting for the Senate to confirm a director for the White House Office of Science and Technology Policy to help coordinate anti-harassment efforts across agencies. Kelvin Droegemeier, a meteorologist at the University of Oklahoma in Norman, has been nominated for that post, but is not yet confirmed. ■



Thousands of years ago, some young children laboured in salt mines in what is now Austria.

ARCHAEOLOGY

Prehistoric children toiled at tough tasks

Kids as young as eight worked as brickmakers and miners.

BY TRACI WATSON

A surge of interest in the archaeology of childhood is revealing details of the skilled and sometimes back-breaking work that youngsters performed hundreds to thousands of years ago.

Their tasks included mining salt and forming bricks. Some children were already learning to create clay vessels by the time they were six years old. Researchers presented several of these findings at a meeting of the European Association of Archaeologists (EAA) in Barcelona, Spain, earlier this month.

Artefacts and skeletal remains that provide details of child labour from so long ago are still relatively sparse. But scholars are showing increasing interest in the subject, says archaeologist Mélie Le Roy at the Mediterranean Laboratory of Prehistory in Europe and Africa-UMR 7269 in Aix-en-Provence, France, who was one of the session organizers.

“In the next years,” she says, “we will find more and more evidence that children were

participating early in their lives in economic society.”

WORKED TO THE BONE

Researchers paid little heed to children in the archaeological record until recently. But in the 1990s, more archaeologists began to examine the role of women in the past. That led some scientists to start studying other overlooked groups — including children.

Recent work suggests that some prehistoric youngsters toiled in harsh environments, including mines. Researchers excavating the ancient salt mines of Hallstatt, Austria, have discovered a child-sized leather cap dated to 1000–1300 BC, along with very small mining picks, says archaeologist Hans Reschreiter at the Natural History Museum of Vienna. This suggests that children were working in these mines at least two centuries earlier than scientists had thought.

To confirm this, Reschreiter and his colleagues plan to test heaps of human excrement found in the Bronze Age section of the ▶

NHM VIENNA/HANS RESCHREITER

► mine for sex hormones, which younger children would lack.

But ancient child labour wasn't always so back-breaking. When Le Roy analysed a jumble of skeletal remains from prehistoric tombs in France, she found three baby teeth with cylindrical grooves. Such abrasions form when people use their teeth for repeated, forceful stretching and softening of animal tendon or plant material, Le Roy says. The material was probably used for sewing or making baskets, she adds (*M. Le Roy Ardèche Archéol.* **35**, 12–18; 2018).

The teeth belonged to two children between the ages of one and nine. They date to 2100–3500 BC, making them some of the oldest evidence that children were engaged in skilled labour. Le Roy is about to start surveying human remains from more than 30 French burial sites from the same time period, and expects to find more evidence of young children at work.

LEAVING THEIR MARK

Other researchers are looking to artefacts rather than skeletons for information on child labour. When archaeologist Steven Dorland at the University of Toronto, Canada, examined ceramic shards from a prehistoric village in what is now southern Canada, he saw minuscule fingernail marks in the fifteenth-century debris. The size of the indentations showed that kids aged six or younger were forming clay vessels (*S. G. H. Dorland J. Archaeol. Sci. Rep.* **21**, 298–304; 2018).

In some modern communities, only pots of a certain quality make it to the kiln. But at Dorland's site, youngsters' misshapen starter pots were also fired. "It shows children in those societies had a certain level of social value," he says.

Even after the advent of written records — which can document the presence of youngsters in the workforce — archaeological evidence can provide powerful illumination of the role of children. Bricks and roof tiles excavated from a Lithuanian castle, dated to between the thirteenth and seventeenth centuries, still bear the fingerprints of their young creators.

Analysis of the prints' ridges suggests that children between the ages of 8 and 13 made more than 10% of the recovered building materials, said archaeologist Povilas Blaževičius at the National Museum of the Palace of the Grand Dukes of Lithuania in Vilnius during his EAA presentation.

Lithuania lacks written sources about children in the historical workforce, Blaževičius says. That leaves physical traces as the only evidence of their efforts there centuries ago. "When we have fingerprints of a child inside a pot, we definitely show that a child formed it," he says. "For me as an archaeologist, it's another way to find children in past societies." ■

SCHRÖDINGER'S CAT

Quantum puzzle baffles physicists

New twist on thought experiment yields conflicting results.

BY DAVIDE CASTELVECCHI

In the world's most famous thought experiment, physicist Erwin Schrödinger described how a cat in a box could be in an uncertain predicament. The peculiar rules of quantum theory meant that it could be both dead and alive, until the box was opened and the cat's state measured. Now, two physicists have devised a modern version of the paradox — with shocking implications — by replacing the cat with a physicist doing experiments.

Quantum theory has a long history of thought experiments, and most are used to point to weaknesses in various interpretations of quantum mechanics. But the latest version is unusual: it shows that if the standard interpretation of quantum mechanics is correct, then different experimenters can reach opposite

conclusions about what the physicist in the box has measured. This means that quantum theory contradicts itself.

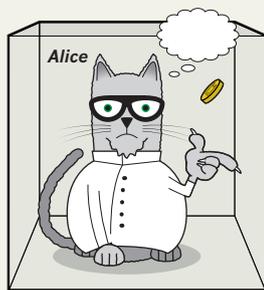
Physicists have debated this conceptual experiment with gusto for more than two years — and it has left most researchers stumped, even in a field accustomed to weird concepts. "I think this is a whole new level of weirdness," says Matthew Leifer, a theoretical physicist at Chapman University in Orange, California.

The authors, Daniela Frauchiger and Renato Renner of the Swiss Federal Institute of Technology in Zurich, first posted their argument online in April 2016, and published a paper on 18 September (D. Frauchiger and R. Renner *Nature Commun.* **9**, 3711; 2018). (Frauchiger has now left academia.)

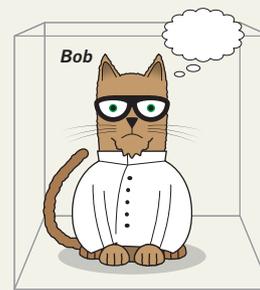
Quantum mechanics underlies nearly all of modern physics. But the answers it provides

NEW CATS IN TOWN

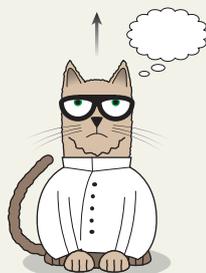
Physicists have devised a variation of the iconic Schrödinger's cat thought experiment that involves several players who understand quantum theory. But surprisingly, using the standard interpretation of quantum mechanics, the observers sometimes seem to come to different conclusions about a particular event — suggesting that the interpretation contradicts itself for complex systems.



Alice tosses a coin and, using her knowledge of quantum physics, sends a quantum message to Bob.



Using his knowledge of quantum theory, Bob can detect Alice's message and guess the result of her coin toss.



Two observers

When the two observers open their boxes, in some situations they can conclude with certainty how the coin landed — but their conclusions are different. This means that the standard interpretation of quantum theory gives an inconsistent description of reality.