News in focus

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Palaeoanthropologist Lee Berger, pictured holding the skull of a *Homo naledi* child, is causing a stir in the palaeontology community.

CRITICISM OF CONTROVERSIAL ANCIENT-HUMAN CLAIMS TESTS *ELIFE*'S PEER-REVIEW MODEL

High-profile researchers say the small-brained *Homo naledi* exhibited advanced behaviours such as burials, but peer reviewers say there's no evidence.

By Ewen Callaway

Archaeologists in South Africa wowed viewers of a Netflix documentary — released last week — with stunning scenes of a cramped cave packed with bone fossils that, they argue, are the remains of the earliest-known burial by humans or their extinct relatives.

But days earlier, four scientists who peer-reviewed the paper making those claims called the supporting evidence "inadequate", in an assessment that sits alongside the paper in the open-access journal *eLife*[1]. The studies are a high-profile test of *eLife*'s new publishing model, in which it no longer formally accepts papers, but instead publishes them alongside peer reviewers' reports.

Vetted but not endorsed, neither accepted nor rejected, the headline-grabbing research on the quarter-of-a-million-year-old human relative *Homo naledi* occupies a liminal zone created by the collision of highly publicized science with changing models of publishing and peer review.

"I want to understand how the *H. naledi* fossils got there. They are very important fossils, and critical to understanding human evolution," says Jamie Hodgkins, a palaeoarchaeologist at the University of Colorado Denver, who was one of the study's four reviewers for *eLife*. However, "there just wasn't any science in the paper ultimately".

Lee Berger, a palaeoanthropologist based at the National Geographic Society in Washington DC, who co-led the research, says that his team stands by its research claims. The authors plan to redraft the paper, taking the reviewers' comments on board.

Cave of bones

The claimed burials are in the Rising Star cave system near Johannesburg, South Africa. In 2015, a team co-led by Berger reported the discovery of some 1,500 bones and teeth

from at least 15 individuals belonging to a new hominin species that they named *Homo naledi*[2].

Later dating showed that *H. naledi* lived relatively recently — between 335,000 and 241,000 years ago. This surprised researchers, given that many of its features, including its small brain, were more typically found in much earlier hominins[3].

Berger's team had previously hinted that the Rising Star site represented a burial. They fleshed out those claims in a preprint last month[4], reporting further excavations of several individuals from two deep chambers.

The researchers say that differences between the composition of the soil surrounding the remains and that in the rest of the cave are a sign of active digging. Some of the bones, including those comprising the right foot, ankle and lower leg bones of one individual, were in the correct anatomical orientation, or articulation, suggesting that they had decomposed in place, another potential sign of intentional burial.

Being at least 240,000 years old, the *H. naledi* remains pre-date the oldest-known *Homo sapiens* burials by at least 100,000 years. Berger and his team argued that such advanced behaviour by a small-brained hominin should force a rethink about the capacities of other ancient human relatives — and of what sets *H. sapiens* apart from them. A second preprint reported scratches on the walls of Rising Star, which the researchers interpreted as intentional engravings by *H. naledi*[5]. Convincing evidence of such symbolic behaviour has previously been found only in *H. sapiens* and Neanderthals (*Homo neanderthalenis*), another big-brained hominin.

Open reviews

Berger's team initially submitted its findings to a leading journal (which he declined to name), but they were ultimately rejected after a six-month review process. "That was a little bit frustrating for us," says Berger.

The authors had had a good experience publishing the initial descriptions and dating of *H. naledi* in *eLife*. So they decided to resubmit the results there under a publishing model that the journal rolled out earlier this year.

Papers submitted to *eLife* under this model must first be posted as preprints. Editors then decide whether to send them out for peer review (a large proportion of submissions are rejected). Studies that the journal agrees to consider are published online alongside the reviews and an '*eLife* assessment' summarizing them. Authors can submit a paper for re-review to get a new assessment, or let the first — or any subsequent revision — stand as the version of record.

Berger's team announced its discoveries at a press conference, coinciding with the release of the preprints on bioRxiv in early June. The team also mentioned that the findings were being reviewed at *eLife*. "We felt and feel these papers were very, very strong," Berger says. "They meet and exceed what this community has published for burials of *Homo sapiens*."

'Inadequate' science

Many scientists were deeply sceptical of the evidence presented. The scattered bones bore little resemblance to those of more completely articulated skeletons from other archaeological sites in which intentional burial is clear, critics said. And the researchers did not make a convincing case that the wall scratchings were made by a hominin, and presented no evidence that they date to a period when *H. naledi* occupied the cave.

"I don't see an anatomical connection, I don't see a hole or a pit that has been intentionally dug," says María Martinón-Torres, a palaeoanthropologist at the Spanish National Research Center for Human Evolution in Burgos, who co-authored an essay critiquing the *H. naledi* findings the day after their announcement. "These hypotheses have been sold with a very strong media campaign before the evidence was ready to support it."

The papers' peer reviews, posted on 12 July, come to much the same conclusion about the scientific evidence. After citing a litany of missing evidence, one reviewer wrote: "The manuscript in its current condition is deemed incomplete and inadequate, and should not be viewed as finalized scholarship."

Berger says that his team is still taking in the reviews, and that the group plans to address some — but maybe not all — of the concerns in future versions. "We haven't published our final paper yet." He says that the team will stop seeking further review "when we feel that we have come as close to meeting the valid criticisms as we could".

Hodgkins says that she agreed to review the burial paper because of the site's importance. But now she's not sure if the time spent reviewing was worth it — or whether she'll volunteer to review any revisions.

Sven Ouzman, an archaeologist and rock-art specialist at the University of Western Australia in Perth, who reviewed the engravings paper for *eLife*[6], says that "the possibility has been raised but the proof really isn't there". He worries that *eLife*'s publishing model has created a loophole that allows unsupported studies to stand. "It's essentially up there and published, and they can say, 'we have reviewed the reviewer's comments, and we thank them for it. But we stand by our arguments,'" he says. "That's sort of cheeky."

An *eLife* spokesperson says that the journal is discussing lessons from the papers, but no changes to the model have been decided.

eLife senior editor George Perry, who oversaw the assessment of the *H. naledi* papers, stands by the decision to send them out for review. "We needed input from expert reviewers to be able to assess whether those interpretations are warranted," says Perry, who is a biological anthropologist at the Pennsylvania State University in University Park.

1. Berger, L. R. *et al. eLife* **12**, RP89106 (2023).
2. Berger, L. R. *et al. eLife* **4**, 09560 (2015).
3. Dirks, P. H. G. M. *et al. eLife* **6**, e24231 (2017).
4. Berger, L. R *et al*. Preprint at bioRxiv https://doi.org/10.1101/2023.06.01.543127 (2023).
5. Berger, L. R. *et al*. Preprint at bioRxiv https://doi.org/10.1101/2023.06.01.543133 (2023).
6. Berger, L. R. *et al. eLife* **12**, RP89102 (2023).

RETRACTION IMMINENT FOR CONTROVERSIAL PHYSICIST

Ranga Dias will have a second paper revoked after a journal found apparent data fabrication.

By Dan Garisto

A prominent journal has decided to retract a paper by Ranga Dias, a physicist at the University of Rochester in New York who has made controversial claims about discovering room-temperature superconductors — materials that would not require any cooling to conduct electricity with zero resistance. The forthcoming retraction, of a paper published by *Physical Review Letters* (*PRL*) in 2021 (ref. 1), is significant because the *Nature* news team has learnt that it is the result of an investigation that found apparent data fabrication.

PRL's decision follows allegations that Dias plagiarized substantial portions of his PhD thesis, and a separate retraction of one of Dias's papers on room-temperature superconductivity by *Nature* last September. (*Nature*'s news team is independent of its journals team.)

After receiving an e-mail last year expressing concern about possible data fabrication in Dias's *PRL* paper — a study not