

yet cold, leaving a few straws for optimists to clutch on to.

The question now is whether it is even worth continuing this research. Here, the message is more nuanced. The project has produced materials, tools and insights — such as calorimeters that operate reliably under extreme conditions, and techniques for producing and characterizing highly hydrided metals — that could benefit other areas of energy and fusion research. But whether the spin-off benefits alone justify continued efforts and investment in pursuit of a probable pipe dream is another matter. Opinions are split.

So what do we take home from a multi-year failed experiment? First, that the programme has been conducted with rigour and attention to detail — we can have confidence in the results. Second, although the work provides no support for fringe groups that continue to insist that cold fusion exists, it does bring this research area back into the light of harsh scientific scrutiny. And, by doing so, the project might help responsible research in this general area to become less taboo, even if the chances of achieving cold fusion still look extremely remote. ■

Beyond retraction

Retracting a manuscript can be an opportunity to revisit the topic afresh.

Readers of this week's *Nature* might well have a justified feeling of déjà vu. In 2017, we published a modelling paper by Hamish Pritchard entitled 'Asia's glaciers are a regionally important buffer against drought', and today we publish a remarkably similar-sounding manuscript by the same author (H. D. Pritchard *Nature* 569, 649–654; 2019). *Nature* is effectively republishing a retracted paper. Why?

Shortly after the original publication, sharp-eyed readers noticed a major error in the incorporation and interpretation of a previously published estimate of glacial mass imbalance. An Editorial Expression of Concern (*Nature* 550, 548; 2017) followed, but because the error affected several aspects of the work, Pritchard retracted the paper, at our suggestion. In doing so, he became free to go back to the drawing board and do his modelling afresh.

Because, editorially, we continued to be interested in the topic, we were open to resubmission of this work, with the caveat that its significance and relevance to *Nature*'s readership would be re-evaluated at that time.

The original paper found that glaciers in the high mountains of Asia provided enough water to meet the basic needs of 136 million people; the republished paper is consistent with these results, but includes a range of estimates of those affected that has an upper limit of 280 million people. After extensive review by the referees, all of whom were familiar with the earlier issues surrounding the work, the revised paper is now published.

Such a case — in which a paper's conclusions become even more compelling after retraction and revision — is rare. The process and outcome, however, highlight the range of reasons for retraction. At one extreme lies clear fraud. Somewhere along the continuum are honest mistakes. At the other extreme is the reality of modern research, in which a complex mix of inputs, models and analysis might yield errors for which a quick correction is not sufficient. Today's unprecedented (for *Nature*) case teaches us to look beyond the 'retraction' label, and to keep an open mind lest we erase significant new discoveries. ■

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