

THIS WEEK



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A priceless resource

The key to treatments for autism and schizophrenia could lie in the brains of recently deceased children. To make advances, researchers need access to an international bank of donated material.

Few subjects in modern science are as emotive as research on the brains of recently deceased children. The pay-off may seem vague — progress towards understanding, and perhaps treating, neurological conditions including autism and schizophrenia. The difficulties, however, are clearer — the brains must be donated by grieving parents who have just lost a child in sudden and sometimes violent circumstances.

So it is easy to understand the reluctance of individual scientists, institutions and funding agencies to press too vocally for access to more brains from newborns, infants and older children, as well as for fetal brains obtained after abortion. Still, as a News Feature on page 442 shows, some patient groups in the United States are raising their voices. These groups deserve support. Moreover, they need scientific organizations in the United States and abroad to endorse and work towards a more ambitious goal: an international tissue bank holding perhaps tens of thousands of brains from young children and human fetuses around the world. *Nature* today pledges its support for such a bank.

The case for such a facility comes down to the growing number of scientists who wish to study brains from these early stages of development. Biological technologies now allow the extraction of a wealth of information about neurological diseases caused by faulty brain development. Neurodevelopmental conditions such as autism, schizophrenia and bipolar disorder are a huge societal burden, yet there are few effective treatments for them. Schizophrenia alone costs the United States tens of billions of dollars each year.

Many scientists working on these diseases have no access to young brain tissue. An informal survey of existing brain banks shows that they hold tissue from barely 1,300 brains collected from fetuses, young children and teenagers.

How can the supply to science of such sensitive material — the very seat of a child's personality — be increased on an international scale? The supply shortage is partly down to logistical problems. But these have been solved by some adult brain banks and, in principle, the logistics are no different when it comes to children.

The largest obstacle — real or perceived — remains the sensitivity of the subject and the difficulty of raising it with parents. Ultimately, this must be confronted, and discussions in the United States are being led by autism advocacy groups, who are used to talking to distressed parents. They are working to convince parents of the value of donating a child's brain, should the child die in an accident. In parallel, the US National Institutes of Health (NIH) has signed up in principle to establish a nationwide network of brain collection that will actively include those of children, and serve wider biomedical communities.

Things are moving slowly, but at least they are moving. And it is not too early to think how this slow domestic progress could be geared up to an international scale. More countries means more donors, and the

high natural variability between brains means that very large numbers can be needed to give studies of brain material statistical significance.

International networking of brain banks has been done before. BrainNet Europe, for example, was established 10 years ago as a single portal for brain tissue collected in 19 different European countries, none of which holds significant amounts of children's brains. The US advocacy organization Autism Speaks has already added a UK collection point in Oxford to its own brain bank.

"It is understandable that bodies such as the NIH don't make strong public statements about extending fetal collections."

Networked collections must also extend to fetal brains, and this is another reason for an international approach. At least eight people, including four doctors, associated with abortion procedures have been murdered for their activities in the United States in the past 20 years, so

it is understandable that bodies such as the NIH don't make strong public statements about extending fetal collections.

The Lieber Institute for Brain Development in Baltimore, Maryland, dedicated to translational research in neurodevelopmental diseases, which opened formally this year, is building a collection of young brains to support its research programme. It will begin its fetal acquisitions at three locations in Europe — Scotland, Denmark and Bulgaria — where the political climate is less hostile. In fact, the Lieber institute is proving a model for how to move ahead on paediatric and fetal brain banking, with appropriate respect for personal and political sensitivities. Would it cooperate with a national or international brain bank network, if created? Yes, say its organizers. But it won't wait for it. There is too much important research that needs to be done. ■

Animal talk

Germany must do more to encourage dialogue on animal experimentation.

Sandwiched between the towering edifices of the Bundestag and the Chancellor's office, and just a short walk from other government buildings, the old family villa that is home to the Swiss embassy makes for a curious sight in the political heart of modern-day Berlin. Last week, the embassy hosted an international meeting of scientists from around the world who defend the use of animals in research. But despite being invited, nobody from the government offices bothered even to drop in. German animal-welfare groups also

declined to attend. That was unfortunate given that the gathering was intended to discuss the principles of the Basel Declaration, which promotes outreach by animal researchers to politicians and the public. And something else failed to materialize — Germany's plans to create a professional office to promote and implement the Basel Declaration principles, which some attendees had hoped would be announced at the meeting by the country's research organizations.

This lack of action reflects poorly on Germany's proclaimed interest in creating an environment within which its generously funded biomedical research can flourish. And it is disconcerting, because, like all countries in the European Union (EU), Germany must translate into national law a complex and controversial directive that regulates the use of animals in research.

The Basel Declaration was drafted at a meeting of mostly Swiss and German scientists last November. It has now been signed by nearly 900 people, some 500 of whom came from other countries. The scientists want the declaration to have the same authority over the ethics of animal experimentation as the 1964 Declaration of Helsinki has over the ethics of human experimentation. The formal infrastructure being developed around the declaration could help to realize this ambition.

The declaration was prompted by concerns over the EU animal-research directive, early drafts of which were so unfriendly to researchers that European scientists were shocked at how unprepared they were to lobby in the same arena as animal welfare and rights groups. Political battles raged for years before the directive was finally approved in 2010. Only one country abstained from what was otherwise a unanimous vote: Germany.

Why? Germany handed prime responsibility for the directive to the agricultural ministry. Others in the government, notably the research ministry, disagreed with this approach and the two ministries could

not agree on much right up to the vote. The agricultural ministry is now handling implementation without consultation with scientists.

Had representatives of the German government showed up at last week's meeting, as their Swiss counterparts did, they would have heard from researchers how the loose wording of much of the directive could create difficulties for them while it is being implemented, and how they must therefore be consulted.

“Germany must translate into national law a complex and controversial directive.”

For example, the directive requires that a ‘severity degree’ classification be introduced for all approved animal procedures. The signatories to the Basel Declaration approve of this, but some government offices in Europe have discussed whether an experiment should automatically be given a higher severity grade if it uses animals that have been genetically engineered, and whether the classifications should be made public.

German animal-welfare groups could also be part of these debates — as Swiss ones are — but they rarely communicate with the research community.

This relationship presents a challenge for German signatories to the Basel agreement and is a prime example of why Germany needs an office to coordinate the outreach the declaration calls for. The country's research funding organizations — particularly stalwarts such as the Max Planck Society, the German Research Foundation and the Helmholtz Society — need to move swiftly to create such an office.

Switzerland has dodged bullets aimed at its sturdy scientific base by animal-rights campaigners and opponents of genetic engineering in recent years, partly by maintaining excellent communication and transparency. Germany will find it even harder to bring these groups together — but even the longest journey must start with a short walk. ■

Scientific climate

Results confirming climate change are welcome, even when released before peer review.

Global warming is really happening — really. There was no conspiracy or cover-up. Peer review did not fail and the scientists who have spent decades working out the best way to handle and process data turned out to know how to handle and process data after all. Thank you Berkeley Earth Surface Temperature (BEST) study.

Four papers released by the BEST team at the University of California, Berkeley, last week are of undoubted interest to the media, given that they support what is portrayed as the mainstream scientific position on climate change. They could also find traction in politics, especially in the United States, where they could be used to combat the assertions of Republicans, who have effectively tossed climate science away. But the headline scientific conclusion, that a century and a half of instrumental measurements confirm a warming trend, is, well, all a little 1990.

Of course, reproduction of existing results is a valid contribution, and the statistical methods developed by the BEST team could be useful additions to climate science. But valid contributions and useful additions alone do not generate worldwide headlines, so the massive publicity associated with the release of the papers (which were simultaneously submitted to the *Journal of Geophysical Research*) is a curious affair.

There was predictable grumbling at the media coverage from within the scientific community, which saw it as publicity in lieu of peer review. Reporters are more than happy to cover the story now, while it's sexy, but will they cover it later, when the results are confirmed, adjusted or corrected in accordance with a thorough vetting? The

short answer is no, many of them will not. Barring an extraordinary reversal of message, the wave of press coverage is likely to be only a ripple when the papers are finally published. And this is what upsets the purists: the communication of science in this case comes before the scientific process has run its course.

Members of the Berkeley team revelled in their role as scientific renegades. Richard Muller, the physicist in charge, even told the BBC: “That is the way I practised science for decades; it was the way everyone practised it until some magazines — particularly *Science* and *Nature* — forbade it.”

This is both wrong and unhelpful. It is wrong because for years *Nature* has explicitly endorsed the use of preprint servers and conferences as important avenues for scientific discussion ahead of submission to this journal, or other *Nature* titles. For example, on page 493 this week we publish a paper that discusses the dwarf planet Eris, based on results that the lead author presented (with *Nature's* knowledge and consent) at a conference several weeks ago. Journalists are, of course, welcome to report what they come across in such venues — as several did on Eris. What *Nature* discourages is authors specifically promoting their work to the media before a peer-reviewed paper is available for others in the field to read and evaluate.

Muller's statement is unhelpful because such inflammatory claims can only fuel the heated but misguided debate on climate-sceptic blogs and elsewhere about the way science works and how it treats those who insist on viewing themselves as outsiders.

To solicit input on results before publication is not a guerrilla action against a shadowy scientific elite. Witness the posting on a preprint server last month of the paper reporting neutrinos that apparently travel faster than light: the authors made it clear that they were seeking help from the wider community to explain the findings, and the media stories (if not the headlines) mostly reflected that. To pretend otherwise can only erode public trust in science, as it is practised by all. ■

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