Story: Gabi Mocatta **Photograph:** The Australian Museum, Sydney

Sixty-four years since the last captive of its species died a lonely death in Hobart's Beaumaris Zoo, science is hoping to work a miracle and bring the thylacine back to life. But 'should we do it?' rather than 'can it be done?' is the question that must be asked as technology attempts the seemingly impossible.

The story has a familiar ring to it. It seems caught in that twilight territory between science fiction and science fact where nothing is certain and everything is possible. It has its cast of colourful characters locked in vehement battle over scientific and ethical propriety, some vociferously in favour of the project, others adamantly against it.

Floating serenely in its jar of preserving liquid, the central character in the unfolding drama is oblivious to the furore that surrounds it. Its lifelike pose suggests a temporary suspension of animation, as if turning away momentarily one might miss the flick of an ear, a yawn or a stretch. It almost seems waiting to spring back to life, which is what some scientists are now convinced it will do. But 134 years since this tiny Tasmanian tiger pup was taken from its dead mother's pouch, undoing the mistakes that led to its species' extinction may be a taller order than many want to admit.

It all began when American professor Mike Archer, a paleontologist by training, took up a new post as director of the Australian Museum in Sydney in January 1999. Archer's interest in the thylacine led to the 'rediscovery' of the bottled tiger pup in question. In fact, such specimens are not uncommon. They are represented in museum collections around Australia and beyond, including our very own ethanol-preserved pup at the Tasmanian Museum and Art Gallery. Archer soon recognised the significance of the Sydney specimen and unleashed a worldwide flurry of interest. Unlike many specimens, it is preserved in alcohol rather than formalin, and its theoretically recoverable DNA seemed to hold the promise of Jurassic Park-style revivification.

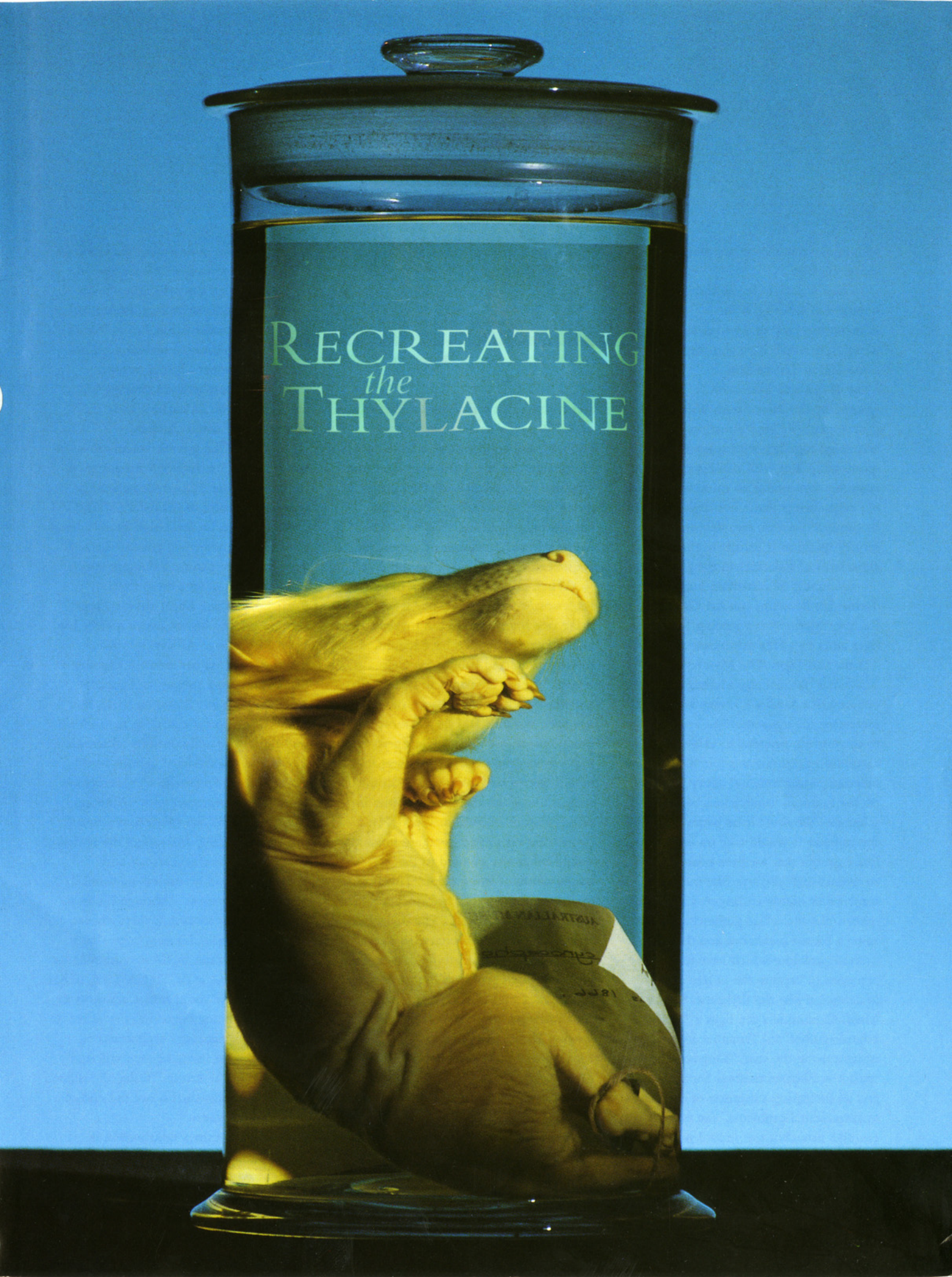
"It just might work," enthuses an ebullient Archer about the recreation project. He has a vision of producing a whole new population of Tasmanian tigers for release into a protected wild environment within the next 50 years. "With cloning, DNA sequencing and all our current genetic technology as well as future technological advances we will undoubtedly make, one would be brave indeed to claim we can't recreate the thylacine."

But Dr Jeremy Austin, a Tasmanian molecular geneticist based at the Natural History Museum in London, does just that. "Even if one found DNA in tiny fragments, to sequence it one would have to establish a genome of around 30 billion nucleotides. That's a vast amount of information." Worse, although ethanol preserves better than formalin, it works by replacing the water in tissue. The time between the death of the pup and the ethanol soaking completely through its tissues may have been many weeks, even months – ample time for DNA to degrade inextricably. "It's essentially science fiction," adds Austin. "I think it's impossible."

Some critics of the scheme are even more scathing. Veteran thylacine researcher, globally acknowledged expert and author of several books on the animal Dr Eric Guiler has little to say regarding the matter. He is a firm believer that it cannot be done. "We don't even know the thylacine's chromosome number," he reminds. "A disgraceful bit of publicity seeking" is his verdict on the project.

But talk to Dr Don Colgan, a molecular biologist at the Australian Museum and the resuscitation seems to return to the realms of scientific possibility. "This is a long-term project," he says, "and we will take it one step at a time." Colgan was able to divulge that the DNA extraction process was happening as we spoke in mid-November 1999, but even if the construction of a so-called 'genetic library' went smoothly, a full-blooded thylacine could not be expected in less that 20 years. He admits that when the resuscitation idea was first mooted about five years ago he was "very sceptical", but there have been such dramatic advances recently in genetic

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RECREATING
the
THYLACINE

Recreating the Thylacine



ROBERT FINKBEINER

technology that almost anything seems feasible.

Then we come to the thorny question of funding. If the resuscitation project does come to fruition, it will have absorbed some $60 to $70 million. Most of this will have been granted by the New South Wales state government (by kind donation of NSW taxpayers) together with some private sponsorship. But with conservative estimates forecasting no more than a five per cent chance that a live thylacine can be produced within two decades, the money question is central to the arguments of objectors to the project.

As curator of vertebrate biology at the Tasmanian Museum and Art Gallery, Kathryn Medlock is a leading Tasmanian tiger authority. Her exhibition entitled "Tasmanian Tiger: The Mystery of the Thylacine" is currently touring the country. But Medlock is sceptical about recreating the thylacine. She compares it to the current proposal to revive a mammoth from remains found in the Siberian permafrost, and above all focuses on the financial implications of such schemes. "Wouldn't it be better to spend the millions it would take on conserving those species that we have pushed close to extinction?" she says. She mentions some other highly endangered Tasmanian species like the white goshawk, the eastern barred bandicoot and the forty-spotted pardalote which have not managed to capture the public imagination like the thylacine. Kathryn Medlock considers the tiger a "mythical, ethical symbol" for Tasmania; its image is ubiquitous in the state. "Our concern with it symbolises remorse for past errors and an increasing awareness of current environmental problems," she says. "It is an emotive issue, but this should not cloud our thinking on the proposal to resuscitate the creature." Medlock sees a whole range of ethical, technical and legal problems, and worries that a recreated thylacine would be just a novelty, paraded for publicity and condemned to live a lonely life like the last live Tasmanian tiger in Beaumaris Zoo. And with the current controversy surrounding genetically engineered organisms, who would be happy with a population of genetically engineered tigers let loose in the state?

When challenged on such issues, Professor Archer is adamant. "If we can make one thylacine, we can make more, and we would by then have identified a suitable, protected habitat for their release." Archer envisages an island sanctuary with restricted access for scientific research. But he has more prosaic plans too. "Tasmanian tigers would make wonderful pets," he believes, and would like to see Australians welcome indigenous species into their homes in place of more conventional pets. He denies that his project is taking funds that would otherwise be used in the conservation of live species. "This is not a question of either/or," he says, but rather an integrated approach. "The thylacines will need a healthy habitat – so our project is promoting habitat conservation too." The high profile of the project, he claims, rubs off on work being done for the protection of other endangered species. This is, after all, solid scientific research that is sure to have tangible spin-offs, not least in our knowledge about reproduction in other marsupials.

Will this be a new trend in conservation, another weapon in the arsenal against species extinction? Or might it lead to complacency with the knowledge that we can always recreate an animal if we push it over the brink of extinction? All are agreed that this will never be an alternative to conventional conservation, but rather an additional technique, a last resort. "It's an extreme conservation strategy I'd much rather we didn't have to contemplate," admits Archer.

But so-called genetic conservation of living species has in fact been going on for years. At the Animal Gene Storage Resource Centre of Australia (AGSRCA) in Melbourne, Dr Ian Gunn heads a team of scientists conserving genetic material from our most threatened native species in an attempt to save them from extinction. "Since European settlement," says Gunn, "the loss of native species has been devastating." At least 42 species have become extinct through pressure from non-native animals and habitat loss. The thylacine is among these. But AGSRCA chooses not to be involved in one-off, high profile projects (although, interestingly, a thylacine appears in the centre's logo). Currently, 651 species are considered threatened with extinction, and it is AGSRCA's mission to prevent this happening by unravelling the secrets of their reproductive biology and embryology, and by improving assisted-breeding techniques. Although Gunn is sceptical about success in the thylacine recreation project, he does hope that it will uncover some useful new knowledge to be put to use at AGSRCA. Like Archer, he is optimistic about future advances in genetic technology, agreeing that if we do not have the necessary techniques to recreate species today, science will surely allow this in the future. "Today, the sudden death of an individual is not the end of the line," he asserts.

There are others who would, in their own way, agree with this. Since the death of what was thought to be the last thylacine in 1936, there have been

numerous sightings of the creature throughout Tasmania, on the mainland, and even as far afield as the remote valleys of Irian Jaya where it is known from pre-history. Although most reported sightings are treated with suspicion, some seem to point to the Tasmanian tigers' continued existence. But extensive expeditions and searches in Tasmania over the last 50 years have failed to prove this conclusively. Although experts are agreed that it is unlikely, the notion that our most remote and secluded areas remain home to the elusive creature is alluring. If these vast areas of untouched wilderness do offer sanctuary to those relics of the thylacine population that we didn't manage to exterminate, this is surely one of the best reasons for their continued protection. It would also be the conclusive argument against recreating the thylacine.

The story of the Tasmanian tiger (to echo Guiler's latest book) truly is a lesson to be learnt. Hunted mercilessly into the jaws of extinction, then feted internationally as Archer's "miracle waiting to happen", the thylacine and its tragic past should serve to remind, above all, that history can never be undone. Even if, with advances in genetic technology, science can one day recreate a thylacine, it will not be cheap or quick or easy. It will not be a solution to man-made extinction. And if the thylacine ever does run wild again, one indelible fact remains.

People in Tasmania co-existed sustainably with the thylacine for thousands of years until the arrival of European settlers. Then it was hounded to extinction in only a century. If science will one day revive dead creatures from beyond extinction, there is one thing it can never fully recreate: harmony and respect between man and the natural world. Having shattered that balance let's hope that science will at least help us pick up some pieces.

John Gould, *The Mammals of Australia*, London, 1845–63 © AUSTRALIAN MUSEUM RESEARCH LIBRARY

