

(Signed by two WWF scientists, a version of this appeared in the Washington Post Outlook section in May, 2000)

Saving Cells is No Way to Save a Species

In one of the early scenes in the movie Jurassic Park, the character played by Jeff Goldblum warns of the arrogance displayed by the fictional theme park's geneticists in the face of nature - an admonition that, of course, goes unheeded until it is too late.

Increasingly, a similar concern is being voiced in the escalating debate over cloning, as new advances in cryobiology, biogenetics and reproductive technologies like embryo transplants begin to transform yesterday's science fiction into tomorrow's reality.

In the barely four years since Scottish scientists startled the world with news that they had cloned a sheep named Dolly, genetic research has progressed almost exponentially. A small menagerie of critters has already followed in Dolly's hoof prints including, most recently, the first cloned primate, a rhesus monkey manufactured in Oregon.

With each new advance, however, come more questions about the medical, ethical and legal implications of such research. Doctors, lawyers, philosophers and animal rights activists have all joined the debate, but conservationists, for the most part, have stayed on the sidelines. This is unfortunate because one of the principal arguments for the direction in which this research is heading - that it represents conservation's most high-tech weapon of last resort in the battle to save endangered species - needs to be challenged.

On the face of it, the argument is compelling. While we have won a few battles here and there, conservationists are losing the war to save biodiversity. All around us, species are dying at an unprecedented pace. The consensus among biologists is that at least one in five species alive today will be extinct within 30 years. But what if we could take the DNA of species we really care about - pandas and tigers, for instance - and store it against the day when these animals have all but disappeared from the wild? If we could breed a test-tube tiger, wouldn't that give us another, albeit last-ditch, chance to save it from extinction?

Around the world, academic institutions and zoos are committing major resources to this Jurassic Park-style approach towards conservation. From the "frozen zoo" assembled by cryobiologists at Texas A&M to the woolly mammoth that Japanese researchers hope to resurrect from the dead by cloning DNA samples found frozen in Siberia, a growing army of 21st Century Noahs is busily constructing high-tech arks in the hopes of protecting critically endangered species from extinction.

As exciting as all this may be from a biologist's viewpoint, it is unlikely to help - and could even seriously harm -- the cause of conservation.

What good is an ark if it has no place to land? However seductive it may appear, the idea that we can save endangered species by taking them into cryo-protective custody ignores the forces that are driving them into extinction in the first place: Habitat loss, illegal wildlife trade, poaching and climate change, to name a few. If the tiger becomes extinct because human beings have converted all of its natural habitat to other uses, to precisely what "wild" are we going to reintroduce a new generation of test-tube tigers 25 or 50 years from now? And if we are not going to return them to the wild, if we are going to breed them merely to ensure a steady supply of gate attractions for our zoos, then what's the point? Certainly not one that has anything to do with conservation.

Some will argue, of course, that genetic research has been used successfully to alleviate inbreeding in species born in captivity and later returned to the wild, which clearly represents a useful application for conservation. Beyond doubt, cryobiology can be an invaluable aid in maintaining genetic diversity among *captive* populations. The problems begin, however, when it comes time to free them.

Unfortunately, successful re-introductions are very rare. Indeed, eight out of 10 attempts to reintroduce endangered species to their native habitats have failed. Even the few that are considered successful - for example, the re-introduction of the Arabian oryx in Oman or the golden lion tamarin in Brazil - have subsequently developed serious problems. The oryx is again being poached to the verge of extirpation, while the tamarin has problems with inbreeding in spite of what has been a cost-is-almost-no-object effort to reintroduce it.

Re-introductions are seldom successful because they address the *effect* of a problem, not its *cause*. The giant panda is

not endangered because its numbers are low. Its numbers are low because logging, farming and the inexorable pressure of human development have consumed most of the habitat it needs to survive.

Even assuming that such factors can be brought under control - and doing so is, after all, the goal of conservation - returning captive-bred animals to the wild is an expensive, long-term endeavor more prone to failure than to success. This is not to say that re-introductions should never be attempted - just that they are a conservation tool of last resort to be used only when more cost-effective measures have failed.

Certainly, it does not follow that the ability to clone a given species will automatically give it a new lease on life in the wild. On the contrary, it almost never will. Natural selection no longer applies to animals kept in zoos or cloned in captive settings. Protected from predators, parasites and diseases, these animals have no further part to play in the ongoing drama of evolution. As a conservation tool, cloning is the equivalent of keeping a comatose and terminally ill patient alive on life support. If we reach that stage, we will have already lost.

The bottom line is that there are no scientific silver bullets or quick technological fixes to the problem of biodiversity loss. The only way we can truly save endangered species is by focusing our efforts and our resources on protecting their habitats and preserving the intricate ecological functions upon which all species depend. Genetic research may indeed prove to be a valuable, if limited, tool for conservation, but the battle to save biodiversity will be won or lost in the field, not in the laboratory.

Towards the end of Jurassic Park, the owner of the by now ruined theme park recalls the trick attractions he created in his youth and says that, all his life, what he most wanted was to create something that was real, not illusionary. Zoos have an indispensable role to play in educating the public and hopefully making it care more about conservation. But unless we can ensure the survival of endangered species in the wild, our zoos will be no more representative of nature than movie sets are of reality, while the animals we pay to see will be but living illusions - - tragic reminders of what we could have saved but, in the end, lost.

