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Alan Pierce

Back From Extinction

The central theme of both *Jurassic Park* movies was the cloning of extinct animals from ancient DNA. These movies raised some interesting questions. Can scientists actually recover DNA from amber-trapped insects? Can this DNA be used to clone



Photos by Alan Pierce

prehistoric animals and plants? Does the technology exist today to actually clone animals back from extinction?

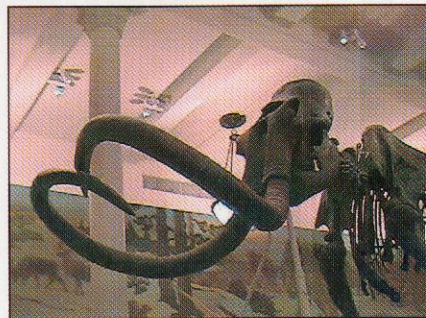
Jurassic Park, the movie, is based on a

most amazing technological achievement. At this very moment, people are recovering ancient DNA from amber in laboratories around the world. This movie switches to science fiction when the Jurassic scientists create dinosaurs by "filling in the gaps" of the incomplete dinosaur DNA by using the DNA of frogs. This part of the movie is scientifically and technologically impossible because the missing information is 99 percent of the organism. To understand just how much of the information is missing, imagine trying to solve a 100-million piece jigsaw puzzle with just a tiny segment from one piece.

At this moment, cloning dinosaurs back from extinction isn't possible because viable DNA for this creature just doesn't exist. However, viable DNA does exist for a 23,000-year-old Woolly Mammoth. This prehistoric creature was found quick frozen in Siberian ice where hair, skin, flesh, and bone are preserved as fresh as meat in your home's deep freezer.

Major advances in cloning have taken place since 1993 when the first *Jurassic Park* movie was released. At this very moment, scientists are trying to bring back from extinction one of the two prehistoric creatures shown in the photos. Since the technology has been basically proven with the cloning of sheep and other mammals, the scientific community now believes that the Woolly Mam-

electricity to reverse differentiation. The protocol to create a clone of a dead Woolly Mammoth sounds simple. Eggs are gath-



ered from a surrogate mother. The nuclei are removed from these donor eggs and replaced with undamaged nuclei from the frozen Woolly Mammoth. A spark of electricity causes the replacement nuclei to fuse with each egg. This spark also reverses differentiation so that each egg starts to function like a normal fertilized egg cell. Implementation into a suitable surrogate is the last step before scientists allow nature to take its course. It is expected that an Asian elephant will serve as the surrogate mother in the above protocol. In 23,000 years, the descendent of the Woolly Mammoth, the elephant, only has a 5 percent genetic difference from its ancestor and therefore should make an excellent surrogate mother.

The promise of this cloning is so real that you should start to see news stories on the topic in the public press and on TV. At Texas A&M a project named Noah's Ark is already underway to freeze tissue from animals on the verge of extinction so that they can be cloned back into existence at a later time. **TD**

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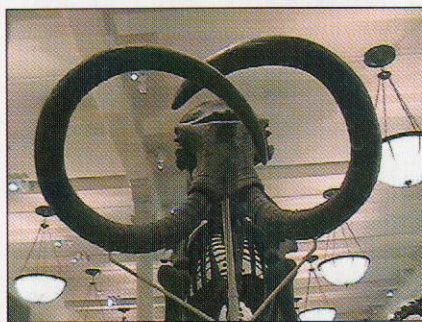


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moth, whose ancient skeleton is shown in the photos below and top right, can be cloned back from extinction.

Until very recently, cloning couldn't be done from adult cells because these cells went through a differentiation process that we didn't understand. After differentiation, the DNA in each cell of the body was only able to reproduce more cells for a particular body part. Dolly the sheep changed all of that when scientists learned how to use a small charge of

Recalling the Facts

1. Can dinosaurs be cloned back from extinction? Why and how, or why not?
2. Can the Woolly Mammoth be cloned back from extinction? Why and how, or why not?
3. Are you for or against this type of cloning? Why?
4. If you were asked to set up a committee of five to ten people (people like presidents, scientists, and priests) to work on guidelines for cloning research, who would you place on this committee?

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