Oldest marsupial fossil found?

When one thinks of marsupials today, images of perky kangaroos and slow-moving koalas beckoning tourists to Australia come most readily to mind. But because Australia's fossil record is rather sparse, paleontologists looking for traces of ancient marsupials have had more success hunting in the Americas. Now scientists have discovered yet another such fossil in North America, which may be the oldest marsupial remain in the world.

Last August, Jeffrey Eaton, a graduate student at the University of Colorado in Boulder, found a marsupial lower jaw and three molars embedded in a southern Utah rock formation that dates from the second half of the Early Cretaceous epoch, about 100 million years (Myr) ago. Previously, the oldest undisputed marsupial fossil was a Canadian specimen that is about 20 Myr younger. The oldest reported marsupials in South America lived about 65 to 70 Myr ago, and the oldest marsupial fossils in Australia are less than 30 Myr old. One researcher has argued that Texas fossils dated several Myr older than the Utah jaw are marsupial remains, but this claim is not widely accepted, according to a number of scientists.

J.M. Natvig/Univ. of Colorado

Marsupial jaw and molars.

Richard Cifelli, a curator at the Museum of Northern Arizona in Flagstaff, who is studying the Utah jaw, thinks the recent find is particularly exciting because Early Cretaceous mammal fossils—especially pieces larger than teeth, which in such mammals can be microscopic in size—are extremely rare. Moreover, Cifelli and Eaton say the teeth in the Utah jaw are surprisingly advanced, resembling those of a family of extinct marsupials that lived 30 Myr later.

By showing that marsupials had arisen and specialized by 100 Myr ago in North America, the jaw also gives clues to the origin of these animals. According to Eaton, paleontologists have long considered South America as the place where marsupials probably originated—in part because they thrived there for so long and also because Australia was once linked to South America by Antarctica. The Utah jaw, say the researchers, does not preclude a South American origin, but it makes North America the more likely candidate.

Eaton and Cifelli are working in isolated and largely unexplored parts of Utah, which they believe are rich in mammal and dinosaur remains from the Cretaceous. Says Jason Lillegraven at the University of Wyoming in Laramie: "I rank this project as one of the five most important research efforts going on in mammalian paleontology today."

—S. Weisburd

Pig vaccine back on sale; query begins

Despite questions about its approval procedure, the U.S. Department of Agriculture has allowed sales to resume for a genetically altered vaccine intended to protect pigs from the disease pseudorabies (SN: 4/12/86, p. 228). The USDA released a 25-page report—titled "Environmental Assessment and Finding of No Significant Impact"—to document its "review and analysis of environmental concerns" regarding its licensing of the live vaccine created with recombinant DNA techniques.

But the actions of the USDA and of the scientists who developed and tested the vaccine are being investigated in all three branches of government. The controversy centers not on the efficacy or safety of the vaccine but on the procedures by which the vaccine was tested and licensed.

The National Institutes of Health (NIH) in Bethesda, Md., has appointed a committee of its scientist-administrators to determine whether an early field test of the vaccine violated NIH guidelines for research involving genetically engineered organisms. This action was in response to a petition by Jeremy Rifkin of the Washington, D.C.-based Foundation on Economic Trends. The petition charges that there was no approval by NIH, or by any Institutional Biosafety Committee (IBC) of the universities involved, for a 1984 field test in which 1,350 pigs were inoculated with the vaccine on a private Texas farm.

In addition, the chairperson of the IBC at Texas A&M University in College Station recently wrote to NIH reporting the 1984 field test as "a potential violation" of recombinant DNA guidelines. That field test involved a collaboration between scientists at Baylor College of Medicine in Houston and Texas A&M.

Rifkin also has filed a suit in federal district court seeking an injunction to stop sales of the vaccine. He charges that the USDA violated both its own regulations on dealing with genetic engineering experiments and products and also the National Environmental Policy Act, which calls for an environmental assessment of significant actions by government agencies.

"In one stroke, the Department of Agriculture has placed itself above the law," Rifkin says. "This agency has completely short-circuited national environmental laws by hurriedly shuffling together a 'paper trail' of miscellaneous documents and calling it an 'environmental assessment.'"

A congressional subcommittee held hearings last week to investigate the circumstances surrounding the field testing and the USDA licensing of the pseudorabies vaccine. "This series of events raises serious questions about USDA's ability and willingness to respond to the concerns of the public, the Congress and the scientific community regarding the release of genetically engineered organisms," said Harold L. Volkmer (D-Mo.), who chairs the Investigations and Oversight Subcommittee of the House Science and Technology Committee.

One issue raised was that the 1984 field test was performed six months before TechAmerica Group, Inc., of Omaha, Neb., applied for a product license. USDA representatives said the department has no authority over tests until it receives a license application, and it does not check on approvals of earlier experiments. Volkmer commented, "You have a loophole here through which you could drive a big truck."

The main arguments focus on two questions: whether the vaccine virus—which has had a gene deleted by recombinant DNA techniques, but which does not itself contain a molecule of DNA combined from different species—is exempt from the NIH guidelines regarding deliberate release; and whether inoculating the virus into pigs on a quarantined farm is indeed an environmental release.

The vaccine's developers point to a USDA memorandum (dated after the field test) advising license applicants, "In normal husbandry and laboratory practices, veterinary biological products are not considered to be released into the environment." But the Texas A&M IBC argues that this should not preempt the NIH guidelines. The newly formed NIH committee is expected to take a few months to propose answers to these questions.

An earlier chapter in the genetic engineering debate came to a close last week. NIH and Rifkin settled a 1983 lawsuit, and the court lifted its injunction against NIH's approval of experiments involving environmental release of genetically engineered organisms. However, it is "becoming increasingly remote" that NIH will be asked to approve future environmental release experiments, says William Gartland of the NIH Office of Recombinant DNA Activities. "The major responsibility has shifted to the regulatory agencies, such as the Environmental Protection Agency and USDA."

—J.A. Miller