

deaths probably would occur in smaller buildings already known to be seismically unsafe.

Highway bridges should ride out a magnitude 7 shaker without major damage, says James E. Roberts of the California Department of Transportation in Sacramento. Although several freeway bridges collapsed in January, strengthened bridges survived and should withstand stronger jolts, he says.

Officials have less optimism about the city's ability to fight quake-sparked fires, which traditionally cause much of the damage during such disasters. Robert Canfield, emergency preparedness coordinator for Los Angeles, noted that the city devoted half its fire-fighting resources to save one burning high-rise in 1987. Should several such blazes break out, the city could rescue people, but it could not save those buildings.

"We are going to have to walk away from them and devote our first efforts to saving lives," Canfield says.

He and others stressed that Northridge claimed so few lives in part because it struck at 4:30 a.m. on a holiday, a time when the garages and freeways that collapsed were nearly empty.

Although the scenario involved a hypothetical earthquake, seismologists say Los Angeles sits on several faults that could produce quakes of magnitude 7 or greater. What's more, the city has not had enough Northridge-size quakes in its history to relieve the strain building underground, says James F. Dolan from Caltech. Magnitude 7 shocks, if they occurred every few hundred years, could release this pressure. But the city has not seen such a killer in at least 2 centuries, a fact that sets seismologists on edge.

—R. Monastersky

Asian link proposed for primate evolution

Excavations in southeastern China have yielded an array of fossils suggesting that Asia played an important role in the early evolution of primates, according to a report in the April 14 NATURE.

Annual fieldwork since 1992 in caves along the face of a limestone quarry near the village of Shanghuang has unearthed about 75 primate fossils, mainly teeth and jaw fragments, and thousands of other mammal bones. Chinese investigators discovered the fossil deposits in 1987.

No volcanic rock for dating exists at the site, but comparisons to North American fossil mammals dated in this way place the Chinese finds at 45 million years old, assert paleontologists K. Christopher Beard and Mary R. Dawson of the Carnegie Museum of Natural History in Pittsburgh and Tao Qi and his coworkers of the Academia Sinica in Beijing.

"The site at Shanghuang has, at a stroke, revolutionized our appreciation of the involvement of Asia in the early evolution of primates," comments anthropologist Robert D. Martin of the University of Zurich in the same NATURE.

Other researchers view the new finds as too fragmentary to support any sweeping revisions of how primates evolved.

Beard and his colleagues identify five new fossil primate species at the Chinese site. These belong either to the lemurlike adapids, the tarsierlike omomyids, or the early simians, forerunners of monkeys, apes, and humans.

Only adapids and omomyids have turned up at North American and European sites of comparable age; several African simians dating to about 40 million years ago have been discovered since 1988.

The proposed Chinese simian, dubbed *Eosimias sinensis*, displays several jaw

and tooth features that distinguish it from adapids and omomyids, Beard argues.

"*Eosimias* shows that early relatives of monkeys lived in Asia about the same time that they lived in Africa," the Pittsburgh researcher maintains. "Whether monkeys first evolved in Africa or Asia cannot be established now."

Various investigators have promoted either omomyids or adapids living between 55 million and 36 million years ago as simian ancestors (SN: 1/12/91, p.20). Beard's group argues that, given the new Chinese evidence, the first simians had appeared by 55 million years ago and derived neither from omomyids nor from adapids.

Dawson notes that some scientists who study fossil primates doubt that the *Eosimias* specimens come from a monkeylike higher primate. In the absence of a more complete skull, the evolutionary identity of *Eosimias* remains unclear, asserts Elwyn L. Simons, an anthropologist at Duke University in Durham, N.C.

"Beard will have a difficult time gaining widespread acceptance of his argument for an important radiation of early [higher primates] in Asia based on such fragmentary evidence," contends Simons, who directs excavations at an



Preliminary reconstruction of *Eosimias*.

N.J. Perkins, M. McNaughton/Carnegie Museum

Egyptian primate site.

In another controversial assessment, Beard's group assigns several fossil teeth from Shanghuang to *Tarsius*, the genus that includes living tarsiers. No other modern primate genus is even half as old as the age proposed for *Tarsius* by the U.S.-Chinese team.

Ancient Chinese tarsiers lived in tropical forests much like those inhabited by modern tarsiers, Dawson holds. "They apparently found a habitat they liked and stuck with it," she says.

But to claim such an ancient age for *Tarsius* based only on fossil teeth "is going way out on a limb," Simons argues. Comparisons with the distinctive faces and limbs of modern tarsiers must also be made, he notes.

Beard and his coworkers assign some Shanghuang fossils to an adapid that resembled an extinct European primate and identify others as an omomyid with anatomical ties to a North American primate of comparable age. Early primates migrated between Asia and other continents 45 million years ago, they suggest.

Early simians may have originated more than 65 million years ago, Martin concludes. But Simons disagrees, noting that the oldest well-established higher primates lived about 40 million years ago.

—B. Bower

Sizing up a smoker's risk of lung cancer

Black smokers run a greater risk of developing lung cancer than white smokers. Although the mechanism underlying that racial difference remains a mystery, scientists now suggest that black smokers may have a greater metabolic predisposition to the malignancy.

The new research may also provide more ammunition for those battling the tobacco industry. Many scientists believe that cigarette manufacturers aggressively target blacks in advertising campaigns designed to draw in new smokers.

John Richie Jr., a biochemist at the American Health Foundation in Valhalla, N.Y., and his colleagues knew that tobacco contains NNK, a nicotine-derived compound that causes lung cancer in mice. The team wanted to find out whether they could detect any differences in the way smokers metabolize this chemical.

They started their investigation by recruiting 25 white and 31 black smokers. The researchers analyzed urine samples from each smoker, homing in on two breakdown products of NNK: NNAL and NNAL-Gluc. NNAL also causes lung cancer in mice. When the body detoxifies NNAL, NNAL-Gluc results.

The researchers hypothesized that smokers whose bodies transformed NNAL into NNAL-Gluc more efficiently