

**PACIFIC MYSTERY:
WHAT KILLED THE GIANT RAT OF THE GALAPAGOS?**

A growing number of Pacific island archipelagos are yielding rich terrestrial biotas, for more kinds of birds, reptiles, mammals, land snails and occasionally even land plants (Finley) than had been previously known. While the time of extinction remains indeterminate in some cases, a middle to late rather than early Holocene age is evident in most. Especially helpful is the new technique of AMS dating which is ideally suited for small samples, the bones of the smaller endemics. Radiocarbon dating on bones of flightless geese and flightless ibis from a stratified cave site on Hawaii (James et al.) indicate extinction concurrent with the initial appearance of bones of the Polynesian rat (*Rattus elegans*) dated around 1000 years ago.

Other Pacific islands to the west of Hawaii appear to have suffered extinctions somewhat earlier than Hawaii (Steadman). A wave of extinctions from west to east, beginning with the appearance of Lapita pottery from New Caledonia and Tikopea in the western Pacific some 4000 years ago, potentially track the spread of prehistoric colonists in an eastward sweep to Hawaii, the Marquesas, Easter Island and, southward, into the more temperate waters of New Zealand. Eastward of the "Polynesian Express" lie the Galapagos, the largest and apparently the only sizable warm water archipelago in the central or eastern Pacific to escape Polynesian colonization, adding interest to the discovery of extinct species of Galapagos rice rats (*Oryzomys*, *Nesoryzomys*) and a giant rat (*Megaoryzomys*), the size of a musk rat (*Ondatra*). If not at the hands of Polynesians or their accompanying commensals, who or what exterminated the giant rat?

Lava tubes on drier parts of the Galapagos have been among a variety of deposits searched for fossils (Steadman). Most bones are surficial or poorly stratified at best. Bones of *Megaoryzomys* appear reasonably fresh, yielding half the nitrogen and collagen found in modern bone. Accordingly, one might predict no appreciable age for the bones.

Nevertheless, well preserved bone of extinct birds and mammals, some with tissue or keratin (horn sheaths, hooves, epidermis or hair) attached, have been found in dry caves in Arizona and adjacent states and dated to 10,000 years or older (Martin). Dates on continental

extinct fauna typically exceed 10,000 years (Mead, Meltzer and Mead). Thus youthful appearances can be deceiving and adding to the importance of dating Galapagos specimens.

Radiocarbon dates on 100 individual bones of the giant rat and one combined sample of bones of an extinct *Oryzomys* yielded ages ranging from modern to 4000 years, eliminating the possibility of an extinction event coeval with that on the continent. The two youngest of ten giant rat dates were, at two sigma, younger than 1500 A.D., approximately the time of historic discovery of the Galapagos by the Bishop of Panama, who reported Galapagos tortoises and land lizards. Although he mentioned nothing about a giant rat, the animal almost surely was akin at the time.

In the absence of any historic account, it appears that no one ever saw a giant rat, much less caused their extinction by direct predation (overkill). Some unknown side of human colonization seems likely, such as competition from introduced European rats (*Rattus*), or introduction of new rat diseases. One may also invoke a plague of cats (*Felis domesticus*) that boomed and swiftly crashed as they overhunted in a feline paradise, a land of innocent, rats never before subjected to feline predation.

Finally, as in cases of many historic extinction, there is a speculative twilight zone, the happy hunting ground of cryptozoologists and other incurable optimists. Parts of Galapagos are rough, wild jumbles of cinder and aa lava, uninhabited even now. The circumstances of extinction are never sufficient to end speculation. Is the giant rat dead and gone, or might a few survive after all?