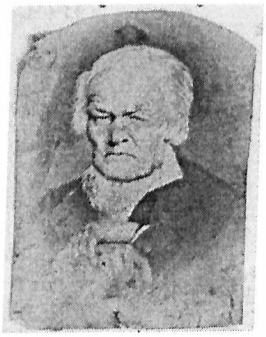
Smithsonian Institution

Spotlight on Science at the Smithsonian

Weekly Newsletter

Vol. 1, No. 6 • March 10, 2003



Sgt. Patrick Gass, the last survivor of the Lewis and Clark's 1803 expedition.

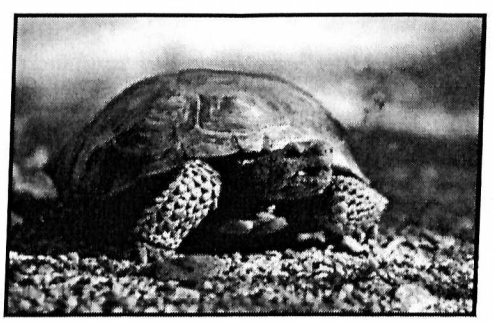
Tintype of Wild Bill Hickok in the James E. Taylor's album.

Drawing the Western Frontiers

One of the Smithsonian's National Anthropological Archives' (NAA's) most important albums, "Our Wild Indians in Peace and War," is featured in a new online exhibit, Drawing the Western Frontier (www.nmnh.si.edu/naa/taylor). The exhibit celebrates the work of James E. Taylor, a 19th-century illustrator who accompanied Gen. William T. Sherman as a Civil War artist and later produced illustrations for *Leslie's Illustrated Newspaper*.

Taylor's drawings portrayed life in the West for the curious public and fostered stereotypes of Native Americans, many of which can be examined through this online exhibit. His personal scrapbook contains images of western personalities, military activities, gold mining, and daily life in Native American, Chinese, Latino, and Mormon communities, as well as his own drawings, newspaper clippings, letters, and autographs. The exhibit includes original tintypes of Wild Bill Hickok, an early image of Buffalo Bill Cody, photographs by Adrian Ebell taken before the Sioux Revolt of 1862, Elizabeth Custer's favorite portrait of her husband, and other famous personalities.

Drawing the Western Frontier links to an online catalog of 748 digital images and a selection of original album pages that show how Taylor assembled his vast personal collection of photographs, illustrations, and western memorabilia. NAA staff produced the online exhibit: Paula Fleming wrote the text, Robert Leopold designed the Web page, and Becky Malinsky scanned the images. NAA collects and preserves historical and contemporary anthropological materials that document the world's cultures and the history of anthropology. Additional online exhibits are available on NAA's Web site: www.nmnh.si.edu/naa.



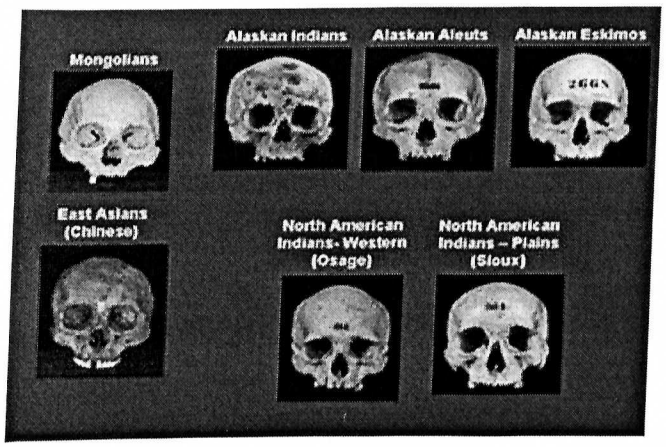
Desert tortoises range from 8" to 15" (upper shell measurement from above head to above tail).

PEP Talks for Desert Tortoises

Desert tortoises are in serious trouble in the Mojave and Colorado deserts of California and adjacent states. Smithsonian National Zoological Park scientist Olav Oftedal has demonstrated that the tortoises' need to use dietary protein to excrete potentially toxic levels of potassium that accumulate in desert plants makes them uniquely vulnerable. However, they can offset this vulnerability by consuming rare plants that contain just the right combinations of water, protein, and potassium (as indicated by the Potassium Excretion Potential, or PEP index).

In three presentations at the Desert Tortoise Council in February and the interagency Desert Managers Group in March, Oftedal argued that tortoises might face a chronic shortage of high-PEP plants due to the combined impacts of long-term grazing and exotic plant invasions. The consequent protein deficiency would explain why wild tortoises so easily succumb to infectious disease, especially in drought conditions.

The implication is that recovery of tortoise populations may only be possible if desert habitat is managed to promote an abundance of high-PEP plants. This novel approach will require a rethinking of existing desert management plans and governmental actions aimed at protecting this threatened species.

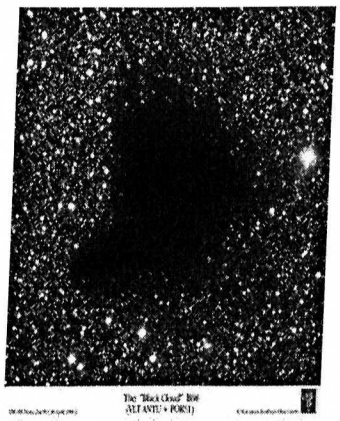


Returning Native American Bones

Establishing the cultural affiliation of human remains is a vital part of legislation that mandates the evaluation and repatriation of human remains to Native American tribes. Often the decision whether to repatriate and to whom is primarily based on biological data. This is particularly challenging when trying to distinguish between Native Americans and Asians, who have traditionally been grouped under the "Mongoloid" label because of assumed similarities in soft tissue and in the skeleton.

The National Museum of Natural History has a large collection of remains that are supposedly Chinese from Kodiak Island, Alaska, where numerous Native American remains also were excavated. Using the latest in digitizing technology, physical anthropologists Steve Ousley and Erica Jones of the Repatriation Office and Jessica Seebauer, a 2002 Research Training Program intern, gathered cranial landmarks from more than 400 Asians and 500 Native Americans in the NMNH collection.

This results of this forensic study call into question the term "Mongoloid," which is misleading both biologically, as it masks underlying variation, and taxonomically, because Mongolians were found to be the most divergent Asian group and were clearly distinct from East Asians and Native Americans. Statistical procedures using 25 measurements classified all three groups correctly 94 percent of the time. East Asians showed greater similarity to Native Americans, especially Alaskan Native Americans, than to Mongolians, but could be separated correctly from Alaskans 93 percent of the time. The remains from Kodiak Island thought to be Chinese were found to be consistent with Chinese and Japanese samples.



The molecular cloud Barnard 68 is seen as a dark patch against a background of stars because it is filled with dust particles that obscure visible light.

A Cloud with a "Heartbeat"

Molecular clouds are collections of gas (mostly molecular hydrogen) and dust found in the spaces between stars. They come in many sizes—from giant clouds stretching over hundreds of light-years and containing as much material as millions of Suns, to small ones with only a single solar mass of material.

This week, Smithsonian Astrophysical Observatory astronomers Charlie Lada, Edwin Bergin, Joao

Alves, and Tracy Huard issued a press release in advance of the publication of their discovery of "Barnard 68," a small cloud that seems to have motions reminiscent of a "heartbeat." Barnard 68 is located about 300 light-years away from Earth (one light year is approximately 6.9 trillion miles). Its molecules show evidence for global, organized motions (some inward, others outward) from the cloud's center—much like the wiggling of Jello in a bowl or the pulsing of a heart.

By measuring the various velocities, the astronomers can obtain a "snapshot" of the cloud at one moment of its complex vibration. They speculate that a wind from a nearby supernova might have slammed into the quiet cloud, setting into motion the oscillations that they now observe.

While Barnard 68 is the first (and so far only) molecular cloud known to have these kinds of internal motions, other astronomical objects—our Sun in particular—are known to pulsate. Scientists anticipate that more detailed analyses of these motions in Barnard 68 will help them better understand the nature of the interiors of molecular clouds in general, as well as the environments in which they exist.

Raccoons Escape to the Islands

A study recently published in the *Journal of Zoology* radically alters views on the protected status of raccoons. Kristofer Helgen (Harvard University) and Don E. Wilson (NMNH) report that raccoons from islands in the Bahamas, Barbados, and Guadeloupe, traditionally thought to be distinct species native to their respective islands, are actually the result of introductions from the eastern United States a few centuries earlier.

The authors contend: "... these animals should not be considered either conservation priorities or recent losses of biodiversity in the Caribbean. Instead, they may actually represent ecological threats to the insular ecosystems on their respective islands."

Many of the specimens used in the study were collected more than a century ago, highlighting the enduring importance of maintaining collections. The authors' work illustrates the usefulness of systematic and biogeographic studies and their implications for conservation.

Recent Publications

Goulet, T.L., and Coffroth, Mary A. 2003. "Genetic composition of zooxanthellae between and within colonies of the octocoral *Plexanra kuma*, based on small subunit rDNA and multilocus DNA fingerprinting." *Marine Biology,* 142(2): 233-239.

Hooper, Elain, Condit, Richard G., and Legendre, Pierre. 2002. "Responses of 20 native tree species to reforestation strategies for abandoned farmland in Panama." *Ecological Applications,* 12(6): 1626-1641.

Oftedal, O.T., Hillard, S., and Morafka, D. 2002. "Selective spring foraging by juvenile desert tortoises in the Mojave Desert: Evidence of an adaptive nutritional strategy." *Chelonian Biology and Conservations,* 4: 341-352.

Peretti, Alfredo V.2002. "Courtship and sperm transfer in the ship spider *Phrynus gervaisii* (*Amblypygi, phyrynidae*): A complement to Weygoldt's 1977 paper." *The Journal of Archnology,* 30(3): 588-600.

Spotlight on Science at the Smithsonian

Spotlight on Science at the Smithsonian is a weekly electronic newsletter about Science at the Smithsonian. It is produced for the Smithsonian community by the Office of the Under Secretary for Science. To contact the editor, e-mail mellendickt@si.edu.

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