

## Crops take a dusting in ancient society

One of the earliest transitions to a politically stratified society in the Americas took place not among crop growers, but among villagers who hunted, fished and gathered wild plants along Mexico's southwestern coast about 3,500 years ago, according to a report in the February *CURRENT ANTHROPOLOGY*.

This finding, along with the excavation of a coastal Peruvian settlement from the same period (SN: 1/19/91, p.38), indicates that many New World coastal societies developed without relying on agricultural techniques, which anthropologists often consider essential to the growth of civilizations.

Researchers led by anthropologist Michael Blake of the University of British Columbia in Vancouver collected 1- to 2-gram bone samples from 36 human skeletons excavated from 15 archaeological sites along the west coast of southern Mexico and Guatemala. The earliest sites date to between 2700 B.C. and 1800 B.C.; the most recent date to

between A.D. 1200 and A.D. 1524.

The scientists ground up each bone sample and produced a dried gelatin for chemical analysis in a mass spectrometer. Ratios of specific carbon and nitrogen isotopes in bone signify the regular consumption of particular classes of agricultural and wild plants, as well as fish and other sea creatures.

Blake's group focused on 16 bone samples taken from "early formative" villagers, who lived in sites in southwestern Mexico from around 1550 B.C. to 850 B.C. Early formative people in Mexico transformed isolated outposts into chiefdoms, with a ruler presiding over politically united villages, the researchers contend.

Previous excavations documented the presence of large settlements, extensive public buildings, elaborate ceramics and figurines, and imported obsidian at early formative sites by approximately 1350 B.C.

Bone analyses indicate that early formative diets revolved primarily

around fishing and gathering of wild plants, the researchers note. Carbon and nitrogen values suggest the villagers consumed "very limited" amounts of maize and related agricultural crops.

Excavation of refuse pits at the Mexican sites provides a more specific inventory of the early formative diet, the investigators note. The menu included several types of freshwater fish, turtles, crocodiles, iguanas and snakes. Remains of white-tailed deer and many other land mammals and birds were also found in the ancient dumps, suggesting considerable hunting.

From 850 B.C. through the first millennium A.D., maize assumed more prominence in the diets of coastal villagers, although the basic hunting-fishing-gathering approach persisted, Blake's group asserts.

Bones from coastal Guatemalan sites reveal the greatest reliance on agricultural crops, which may help explain why those settlements grew larger than the ones 60 miles north in southwestern Mexico.

— B. Bower

## Bush's '93 budget brightens civilian R&D

The federal budget President Bush sent to Congress last week had to comply with a chilling constraint: A congressional act, aimed at cutting the deficit, freezes most domestic spending at current levels. And overall, the \$76.6 billion that Bush requested for research and development in fiscal year 1993, which begins this Oct. 1, shows no increase over fiscal 1992 spending — after accounting for a projected 3 percent inflation rate.

But that sobering statistic hides a key feature. Defense R&D spending, which makes up about 59 percent of the pot, would sustain a 2 percent decrease after inflation. By contrast, civilian R&D would enjoy a modest but significant inflation-adjusted increase of 4 percent, with several R&D agencies enjoying a real-dollar boost of 1 to 8 percent.

(Percent changes noted for all subsequent budget figures are adjusted to account for the administration's fiscal 1992 inflation estimate.)

As in the past two years, Bush's budget planners sought to make a big splash in science with a colorful booklet highlighting a big budget and "unprecedented" interagency coordination in key research areas. Global change came first, followed by science education and high-performance computing and communication in fiscal 1992. For fiscal 1993, biotechnology

and advanced materials and processing have gained high status as "new initiatives."

Although Congress will likely alter Bush's spending blueprint before appropriating funds for it later this year, lawmakers have a history of supporting increases for science. Among highlights in the President's R&D budget:

- The Strategic Defense Initiative, or "Star Wars" program, would skyrocket to \$5.4 billion, a 27 percent increase.

- At \$175 million, funding for the Human Genome Project would climb 4 percent.

- The Superconducting Super Collider would get \$650 million, a 28 percent increase.

- Throughout the federal government, grants to individual researchers would rise 6 percent — to \$8 billion.

- A grants program in agricultural R&D would jump by 50 percent, to \$150 million. The administration plans to target the funds into programs on the environment; nutrition, food quality and health; plant research (including genetics); marketing, trade and policy; animal studies; and developing new products.

- Bush proposes \$1.4 billion, a 14 percent increase, for transportation R&D. Some \$470 million would fund aviation R&D, and \$28 million (a 37 percent jump) would support high-speed rail projects, including magnetically levitated trains. Together, NASA and the Defense Department would contribute \$260 million toward development of the National

FY 1993 Federal R&D Funding Budget Authority* (in millions)				
Department or Agency	1991 Actual	1992 Actual	1993 Proposed	% Change: '92 to '93
Conduct of R&D:				
**Defense-military	35,176	40,043	40,509	+ 1.2
Health and Human Services (NIH)	9,273 (8,277)	10,216 (8,953)	10,649 (9,396)	+ 4.2 (+ 4.9)
Energy	6,149	6,514	6,578	+ 1.0
NASA	7,271	7,706	8,673	+ 12.5
National Science Foundation	1,828	1,967	2,375	+ 20.7
Agriculture	1,224	1,328	1,332	+ 0.3
Interior	584	583	552	— 5.3
Environmental Protection Agency	433	496	525	+ 5.8
Other Agencies	2,173	2,240	2,432	+ 8.6
Subtotal, Conduct of R&D	64,111	71,093	73,624	+ 3.6
R&D facilities	3,082	3,498	2,933	— 16.2
Total	67,193	74,592	76,557	+ 2.6

\*Derived from OMB data; all figures reflect rounding

\*\*Does not include Energy Department's defense programs

*Shading denotes budgets which, after accounting for inflation, would lose ground in comparison with last year's levels.*