



- HOME
- ANIMALS
- DAILY NEWS**
- ENVIRONMENT
- HISTORY
- KIDS
- MAPS
- MUSIC
- PEOPLE & PLACES
- PHOTOGRAPHY
- SCIENCE & SPACE
- VIDEO

- NATIONAL GEOGRAPHIC MAGAZINE
- MAGAZINES
- SHOP
- SUBSCRIPTIONS
- TV & FILM
- TRAVEL WITH US
- OUR MISSION

# NATIONAL GEOGRAPHIC NEWS

REPORTING YOUR WORLD DAILY

NEWS HOME ANIMAL NEWS ANCIENT WORLD ENVIRONMENT NEWS CULTURES NEWS SCIENCE & SPACE NEWS WEIRD NEWS

## Ancient Mexican Carvings Being Erased by Acid Rain, Experts Say



Email to a Friend

<< Back to Full Story

Children play among the archaeological ruins of El Tajin in March 2000. Experts say the elaborate carvings for which El Tajin is known are being eroded by acid rain stemming from nearby chemical plants and oil refineries.

Omar Torres/AFP/Getty Images



- Books & Atlases
- Clothing & Accessories
- DVDs
- Maps
- Catalog Quick Shop

### Sign up for free Newsletters

Once a month get new photos and expert tips.

Sign up

ADVERTISEMENT

- 15 Most Popular News Pages
- Photos in the News
- News Videos

ADVERTISEMENT

### NATIONAL GEOGRAPHIC'S PHOTO OF THE DAY



- Today's Photo
- Download as Wallpaper

### Podcasts



### National Geographic to Go

National Geographic News, Videos, and More  
Download Podcasts

### TODAY'S MOST POPULAR NEWS STORIES



Video: Warming Hurting Arctic Animals (Corrected)



Top Ten Photos of 2007 From National Geographic News



Newborn Planet Found Orbiting Young Star

15 Most Popular News Stories

### NEWS FEEDS XML RSS

Get our news delivered directly to your desktop—free.  
How to Use XML or RSS

### FREE NEWSLETTER

Sign up for our free Inside National Geographic newsletter.

Every two weeks we'll send you our top stories and photos (see sample).



- HOME
- ANIMALS
- DAILY NEWS**
- ENVIRONMENT
- HISTORY
- KIDS
- MAPS
- MUSIC
- PEOPLE & PLACES
- PHOTOGRAPHY
- SCIENCE & SPACE
- VIDEO

- NATIONAL GEOGRAPHIC MAGAZINE
- MAGAZINES
- SHOP
- SUBSCRIPTIONS
- TV & FILM
- TRAVEL WITH US
- OUR MISSION



- Books & Atlases
- Clothing & Accessories
- DVDs
- Maps
- Catalog Quick Shop

### Sign up for free Newsletters

Once a month get new photos and expert tips.

[Sign up](#)

ADVERTISEMENT

## NATIONAL GEOGRAPHIC NEWS

REPORTING YOUR WORLD DAILY

- NEWS HOME
- ANIMAL NEWS
- ANCIENT WORLD
- ENVIRONMENT NEWS
- CULTURES NEWS
- SCIENCE & SPACE NEWS
- WEIRD NEWS

### Ancient Mexican Carvings Being Erased by Acid Rain, Experts Say

Stefan Lovgren  
for National Geographic News  
January 26, 2007

Pollution is threatening to erase thousand-year-old stone carvings at one of Mexico's most important archaeological sites, a new study shows.

The pre-Aztec city of El Tajin, located on Mexico's Gulf coast, is famous for its temple pyramids and intricately carved reliefs.



[Enlarge Photo](#)

- [Printer Friendly](#)
- [Email to a Friend](#)

#### RELATED

- [Aztec Temple Found in Mexico City "Exceptional," Experts Say](#)
- [Ancient Pyramid Found at Mexico City Christian Site \(April 6, 2006\)](#)
- [Photo Gallery: Mexico's "Pyramid of Death"](#)

But acidic air pollutants pumped out by oil-drilling platforms and power stations along the coast are slowly eroding these carvings, according to Humberto Bravo, an air pollution specialist.

"The deterioration is alarming ... and could cause irreparable damage to monuments that are an important part of our cultural heritage," said Bravo, of the University of Mexico's Center for Atmospheric Sciences.

#### God of Thunder

El Tajin was built in what is now the state of Veracruz by the Totonac, a civilization that reached its peak from the early 9th to the early 13th century A.D. (See [Mexico map](#).)

Much of El Tajin—the city name refers to one of the names for the Totonac god of thunder—remains unexcavated.

The site's most famous building is an elaborate niche-studded pyramid.

The ceremonial center also has a number of other temple pyramids, palaces, and courts for playing a ritual Mesoamerican ball game sometimes compared to basketball.

No other site has as many depictions of ball players and their equipment as the sculptures and carvings at El Tajin, whose inhabitants were apparently great fans of the game.

It is unclear how exactly the game was played, but it may have served as a training exercise for young warriors. Losers of the game may have been sentenced to death.

Now the carvings depicting the game are beginning to erode at an alarming rate, according to Bravo.

[Continued on Next Page >>](#)

- [15 Most Popular News Pages](#)
- [Photos in the News](#)
- [News Videos](#)

#### ADVERTISEMENT

#### LATEST PHOTOS IN THE NEWS

- [Week in Photos: Weird White Dwarf, WWII Bomb, and More](#)
- [Python Undergoes Golf Ball-ectomy](#)
- [Fooled Ants "Adopt" Rare Butterflies](#)

[More Photos in the News](#)

#### NATIONAL GEOGRAPHIC'S PHOTO OF THE DAY

- [Today's Photo](#)
- [Download as Wallpaper](#)

#### NEWS FEEDS [XML](#) [RSS](#)

Get our news delivered directly to your desktop—free. [How to Use XML or RSS](#)

#### Podcasts

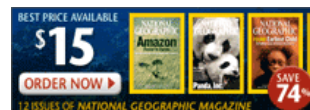


**National Geographic to Go**  
National Geographic News, Videos, and More  
[Download Podcasts](#)

#### FREE NEWSLETTER

Sign up for our free [Inside National Geographic newsletter](#).

Every two weeks we'll send you our top stories and photos ([see sample](#)).



[LATEST NEWS VIDEOS](#)

[SOURCES AND RELATED WEB SITES](#)



- HOME
- ANIMALS
- DAILY NEWS
- ENVIRONMENT
- HISTORY
- KIDS
- MAPS
- MUSIC
- PEOPLE & PLACES
- PHOTOGRAPHY
- SCIENCE & SPACE
- VIDEO

- NATIONAL GEOGRAPHIC MAGAZINE
- MAGAZINES
- SHOP
- SUBSCRIPTIONS
- TV & FILM
- TRAVEL WITH US
- OUR MISSION



- Books & Atlases
- Clothing & Accessories
- DVDs
- Maps
- Catalog Quick Shop

### Sign up for free Newsletters

Once a month get new photos and expert tips.

[Sign up](#)

ADVERTISEMENT

## NATIONAL GEOGRAPHIC NEWS

REPORTING YOUR WORLD DAILY

- NEWS HOME
- ANIMAL NEWS
- ANCIENT WORLD
- ENVIRONMENT NEWS
- CULTURES NEWS
- SCIENCE & SPACE NEWS
- WEIRD NEWS

# Ancient Mexican Carvings Being Erased by Acid Rain, Experts Say

[<< Back to Page 1](#) Page 2 of 2

"Within 10, 20, or 100 years, these hieroglyphics will disappear if we don't do anything about it," Bravo said.

### Acid Rain



[Enlarge Photo](#)

- [Printer Friendly](#)
- [Email to a Friend](#)

### RELATED

- [Aztec Temple Found in Mexico City 'Exceptional,' Experts Say](#)
- [Ancient Pyramid Found at Mexico City Christian Site \(April 6, 2006\)](#)
- [Photo Gallery: Mexico's "Pyramid of Death"](#)

Bravo and his colleagues spent several years simulating the effects of polluted air and acid rain on El Tajin's soft limestone buildings.

He blamed the erosion on contaminants like chlorine, sulfates, and nitrates in the air from power stations and oil refineries.

Acid rain causes erosion on ancient monuments because the sulfuric and nitric acid chemically reacts with the calcium carbonate in the stones to create gypsum, which then flakes off.

Acid rain forms when pollutants in the air become trapped inside water droplets in a cloud. The pollution is then carried down to earth with the rain.

"The Veracruz region has some of the highest acid levels in the air in Mexico," Bravo said.

### Widespread Problem

Other scholars expressed similar alarm at the detrimental effects of pollution on El Tajin.

"The art of El Tajin is crucial to our understanding of the ancient history of the Gulf coast," said John Machado, a pre-Columbian art historian at Chaffey College in Rancho Cucamonga, California.

"It gives evidence of a powerful and complex civilization that had broad interaction with Mesoamerican cultures in both central Mexico and Maya-controlled regions but still cultivated its own unique Veracruz style and iconography."

"The loss of these images would be devastating to the cultural heritage of the area," said Machado, who has done extensive research at El Tajin.

But the problem of pollution affects archaeological sites throughout Mexico.

The sources of degradation vary, said Maria Lourdes Gallardo, chief conservator at the main Aztec temple, Templo Mayor, in Mexico City.

"The pollutants ... in the archaeological zone of Templo Mayor ... range from the smog to water filtrations underground," Gallardo said.

"We found that there had been a significant change in the rate of pollutants derived from sulfur, which had diminished considerably, compared to an increase in the quantity of chloride and heavy metal pollutants."

(Read related story: "[Aztec Temple Found in Mexico City 'Exceptional,' Experts Say](#)" [October 5, 2006].)

David Grove, a professor emeritus of anthropology at the University of Illinois at

- [15 Most Popular News Pages](#)
- [Photos in the News](#)
- [News Videos](#)

### ADVERTISEMENT

### LATEST PHOTOS IN THE NEWS

- [Week in Photos: Weird White Dwarf, WWII Bomb, and More](#)
- [Python Undergoes Golf Ball-ectomy](#)
- [Fooled Ants "Adopt" Rare Butterflies](#)

### More Photos in the News

### NATIONAL GEOGRAPHIC'S PHOTO OF THE DAY

- [Today's Photo](#)
- [Download as Wallpaper](#)

### NEWS FEEDS [XML](#) [RSS](#)

Get our news delivered directly to your desktop—free. [How to Use XML or RSS](#)

### Podcasts

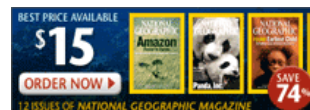


**National Geographic to Go**  
National Geographic News, Videos, and More  
[Download Podcasts](#)

### FREE NEWSLETTER

Sign up for our free [Inside National Geographic newsletter](#).

Every two weeks we'll send you our top stories and photos ([see sample](#)).



Urbana-Champaign, has worked extensively at the site of Chalcatzingo in Morelos, 60 miles (97 kilometers) south of Mexico City.

The site is noted for its Olmec-style bas-relief carvings dating back to 700 B.C. in granodiorite, a rock much harder than limestone.

"I can document with 30 years of photographs just how acid rain is destroying those magnificent works of art," he said. "The details are slowly disappearing."

**Free Email News Updates  
Best Online Newsletter, 2006 Codie Awards**

*Sign up for our Inside National Geographic newsletter. Every two weeks we'll send you our top stories and pictures (see sample).*

[<< Back to Page 1](#) Page 2 of 2

**LATEST NEWS VIDEOS**



**Video: Can Light Cure Arctic Blues?**



**Video: Python Swallows Golf Balls**



**Video: Fin Soup Drives Shark Decline**

**More Videos in the News**

**SOURCES AND RELATED WEB SITES**

[Museo del Templo Mayor \(Spanish\)](#)

[University of Mexico](#)

**Sponsored Links**

**[Could You Be a Nurse?](#)**

Take this Quiz to Find Out if Nursing is the Career For You.

**[K-12 Teacher Courses](#)**

Non-classroom, salary advancement courses for teachers. \$95/credit.

**[Come with Us. Inspirit Your Wanderlust](#)**

Specialized travel in the US & Canada by train, ship & riverboats.

**[Airline Tickets](#)**

Compare all major travel sites. Save up to 40% on airfare.

**[Pocket Stars Astronomy Star Chart](#)**

Astronomy software for Windows Mobile Pocket PC and Smartphone.

[Email the News Staff](#) [Contact Other Staff](#)

ADVERTISEMENT

[Home](#) | [Animals](#) | [Daily News](#) | [Environment](#) | [History](#) | [Kids](#) | [Maps](#) | [Music](#) | [People & Places](#) | [Photography](#) | [Science & Space](#) | [Video](#)

[Magazines](#) | [Shop](#) | [Subscriptions](#) | [TV & Film](#) | [Stock Footage Sales](#) | [Travel With Us](#) | [About the Society](#) | [Educators](#)

[Give to NGS](#) | [Contact Us](#) | [Newsletters](#) | [Jobs](#) | [Site Index](#) | [Press Room](#) | [Customer Service](#) | [Advertise With Us](#) | [Global Sites](#) | [Terms of Service](#) | [Privacy Policy](#)

© 1996-2008 National Geographic Society. All rights reserved.