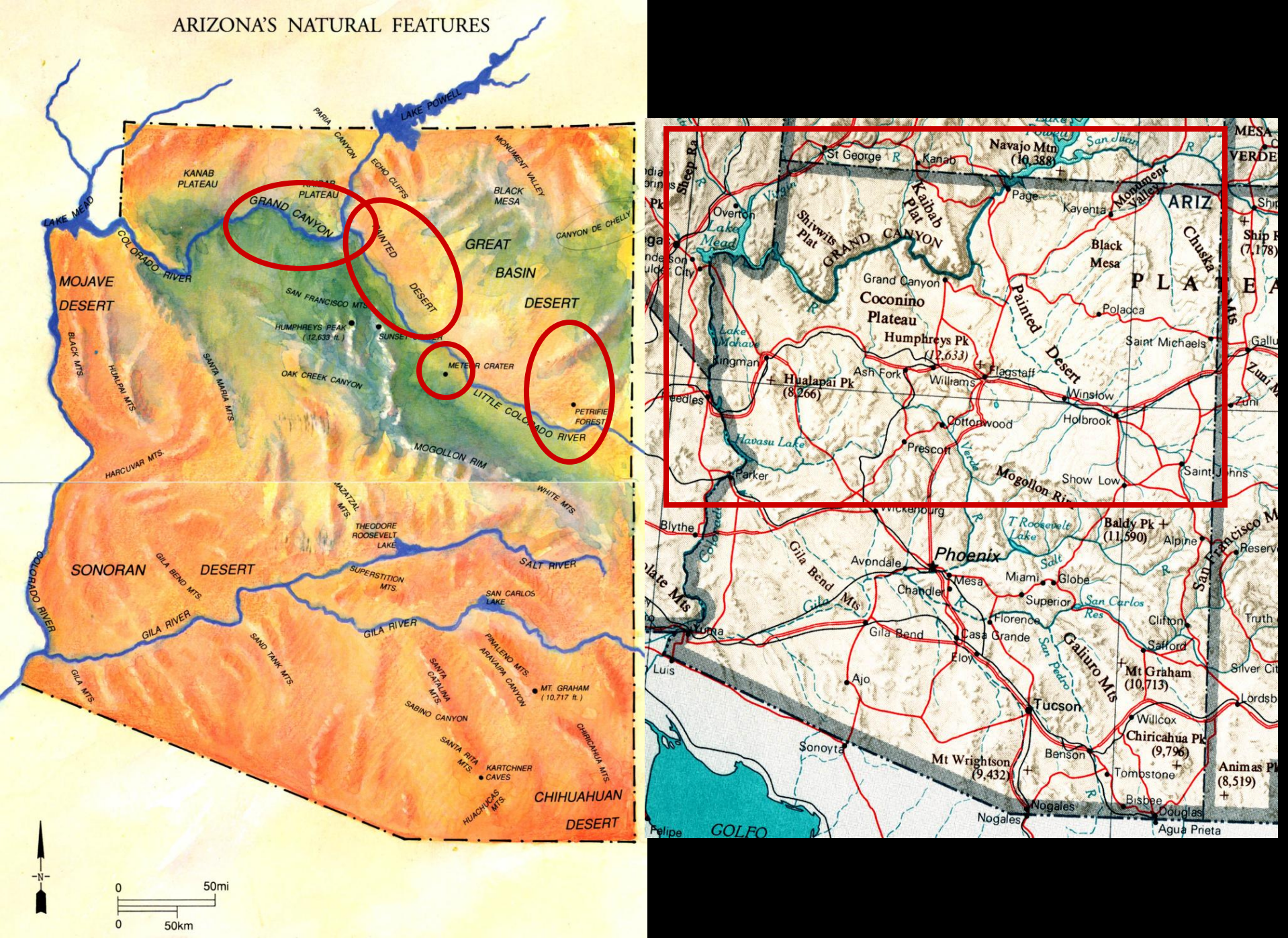
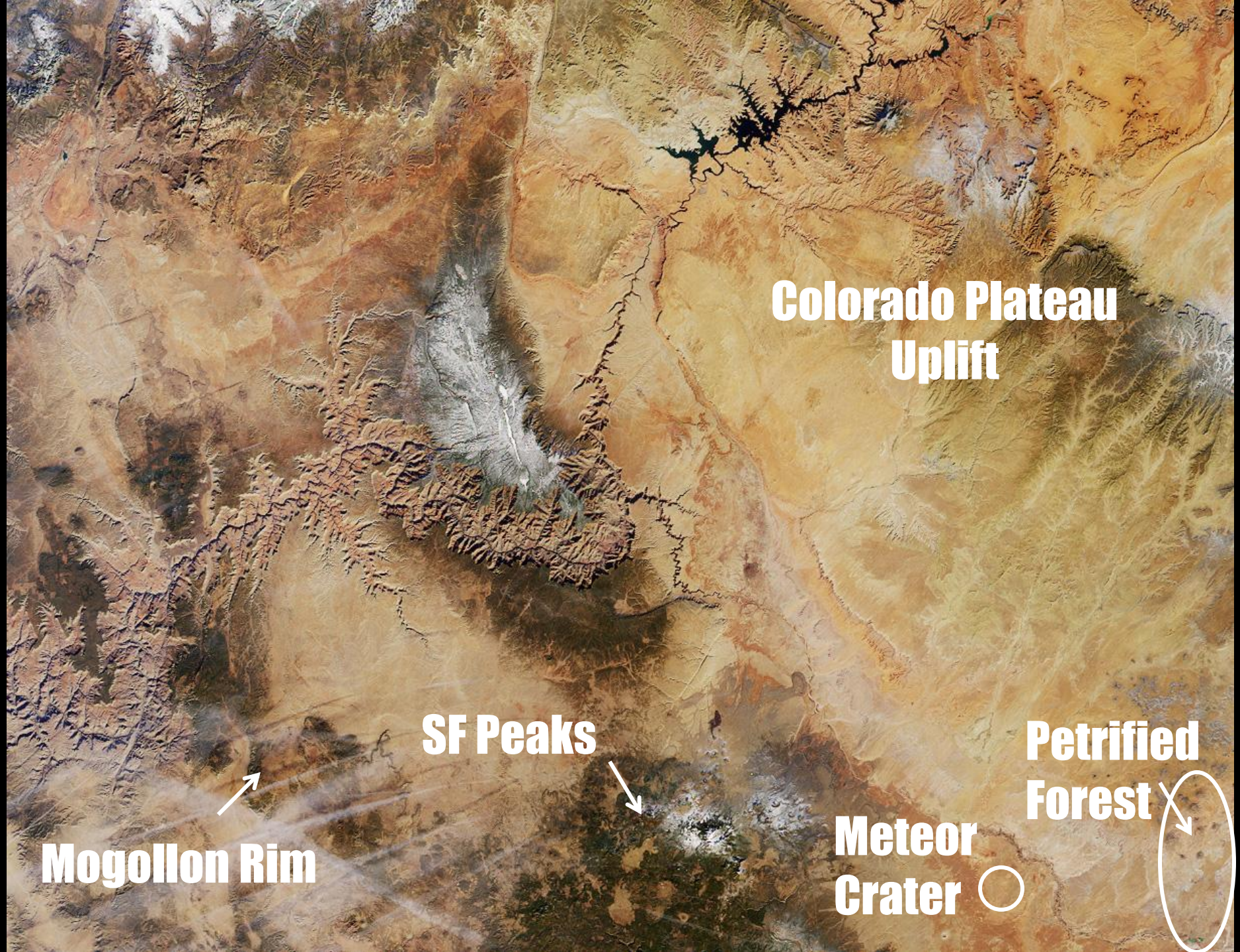
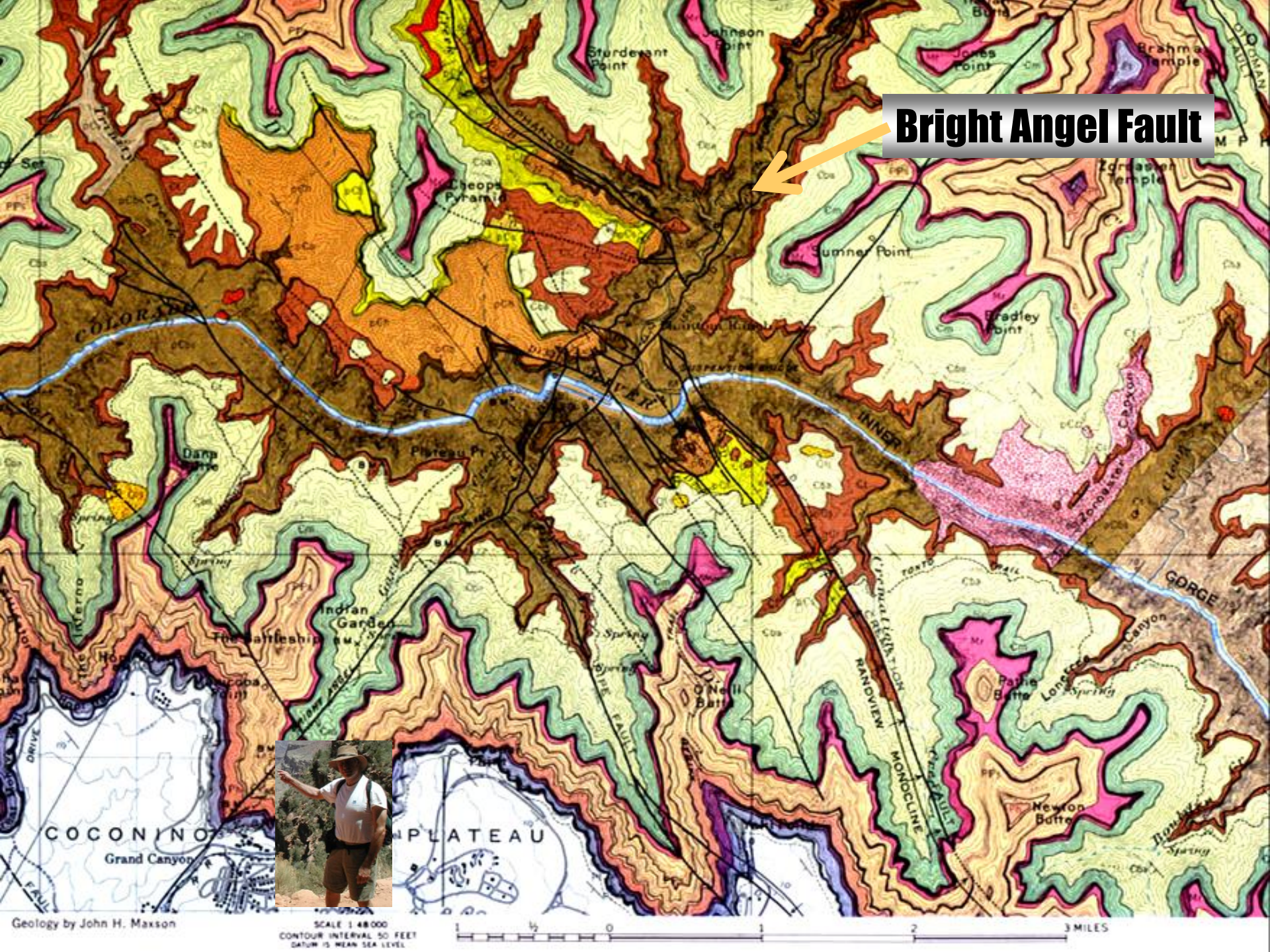

THE PAINTED DESERT and
PETRIFIED FOREST of ARIZONA
Charles Merguerian


125°W
120°W
115°W
110°W
105°W
Vancouver
Cape Flattery
Mt. Olympus 2428m
Strait of Juan de Fuca
Puget Sound
Seattle
Grand Coulee Dam
Lake Pend O'Reille
Flathead Lake
Franklin D. Roosevelt Lake
Coeur d'Alene Lake
Columbia R.
Snake R.
Missouri R.
Milk R.
WASHINGTON
Portland
Cascade Ranges
Blue Mts.
Bitterroot Range
Salmon R.
MONTANA
OREGON
Columbia Plateau
Salmon River Mts.
Yellowstone
IDAHO
American Falls Res.
Big Horn R.
Pathfinder
Wyoming Basin
Goose Lake
Shasta Lake
Pyramid Lake
Humboldt R.
Great Salt Lake
Great Salt Lake Desert
Wasatch Range
Uinta Mts.
Utah Lake
Carson Sink
Ruby Mts.
Lake Tahoe
Sacramento R.
Sacramento Valley
NEVADA
Great Basin
Sevier Lake
UTAH
Green R.
Colorado Plateau
Sierra Nevada
San Joaquin R.
San Joaquin Valley
Coast Ranges
Monterey Bay
San Francisco
Mt. Whitney 418m
Death Valley 86m
Lake Mead
Glen Canyon Dam
Lake Powell
Canyon
Hoover Dam
Little Colorado R.
Pt. Conception
Los Angeles
Mojave Desert
Channel Islands
ARIZONA
Parker Dam
Phoenix
Salt R.
Colorado R.
Gila R.
Salton Sea
Imperial Valley
San Diego
Tijuana
Elephant Butte Res.
El Paso
Pecos R.
NEW MEXICO
Colorado Plateau
Lake Mead
Lake Powell
Glen Canyon Dam
Hoover Dam
Canyon
Little Colorado R.
ARIZONA
Parker Dam
Phoenix
Salt R.
Colorado R.
Gila R.


ARIZONA'S NATURAL FEATURES
LAKE POWELL
PARIA CANYON
KANAB PLATEAU
GRAND CANYON
ECHO CLIFFS
MONUMENT VALLEY
BLACK MESA
CANYON DE CHELLY
LAKE MEAD
COLORADO RIVER
PAINTED DESERT
GREAT BASIN DESERT
MOJAVE DESERT
SAN FRANCISCO MTS.
HUMPHREYS PEAK (12,633 ft.)
SUNSET CRATER
METEOR CRATER
OAK CREEK CANYON
PETRIFIED FOREST
LITTLE COLORADO RIVER
MOGOLLON RIM
BLACK MTS.
HUALPAI MTS.
SANTA MARIA MTS.
HARCUVAR MTS.
MAZATZAL MTS.
WHITE MTS
THEODORE ROOSEVELT LAKE
SALT RIVER
SONORAN DESERT
GILA BEND MTS.
SUPERSTITION MTS.
SAN CARLOS LAKE
GILA RIVER
SAND TANK MTS.
PINALENO MTS.
ARAVAIPA CANYON
MT. GRAHAM (10,717 ft.)
SANTA CATALINA MTS.
SABINO CANYON
SANTA RITA MTS.
CHIRICAHUA MTS.
KARTCHNER CAVES
HUACHUCAS MTS.
CHIHUAHUAN DESERT
GILA MTS.
0 50mi
0 50km
St George
Kanab
Navajo Mtn (10,388)
Page
Kayenta
Overton
Lake Mead
Shivwits Plat
Kaibab Plat
GRAND CANYON
Monument Valley
ARIZ
Black Mesa
Grand Canyon
Coconino Plateau
Painted Desert
Polacca
Saint Michaels
Lake Mohave
Kingman
Humphreys Pk (12,633)
Hualapai Pk (8,266)
Ash Fork
Williams
Flagstaff
Winslow
Holbrook
Cottonwood
Prescott
Havasu Lake
Parker
Show Low
Blythe
Wickenburg
Phoenix
Baldy Pk (11,590)
Alpine
Avondale
Mesa
Chandler
Miami
Globe
Superior
Florence
Gila Bend
Casa Grande
Eloy
Ajo
Yuma
Tucson
Mt Graham (10,713)
Safford
Clifton
Willcox
Chiricahua Pk (9,796)
Benson
Tombstone
Sonoyta
Mt Wrightson (9,432)
Nogales
Bisbee
Douglas
Agua Prieta
GOLFO


Colorado Plateau
Uplift
SF Peaks
Petrified
Forest
Meteor
Crater
Mogollon Rim

Look Vern, It's the Grand Canyon


Bright Angel Fault
Sturdevant Point
Johnson Point
Jones Point
Brahma Temple
Zoroaster Temple
Cheops Pyramid
Sumner Point
Bradley Point
COLORADO
Plateau Pt
INNER
GORGE
Indian Garden
Battleship Butte
O'Neill Butte
RANDVIEW
MONOCLINE
PIPE FAULT
Newton Butte
COCONINO
PLATEAU
Grand Canyon
Geology by John H. Maxson
SCALE 1 48 000
CONTOUR INTERVAL 50 FEET
DATUM IS MEAN SEA LEVEL
1 ½ 0 1 2 3 MILES

Early Work on the Grand Canyon

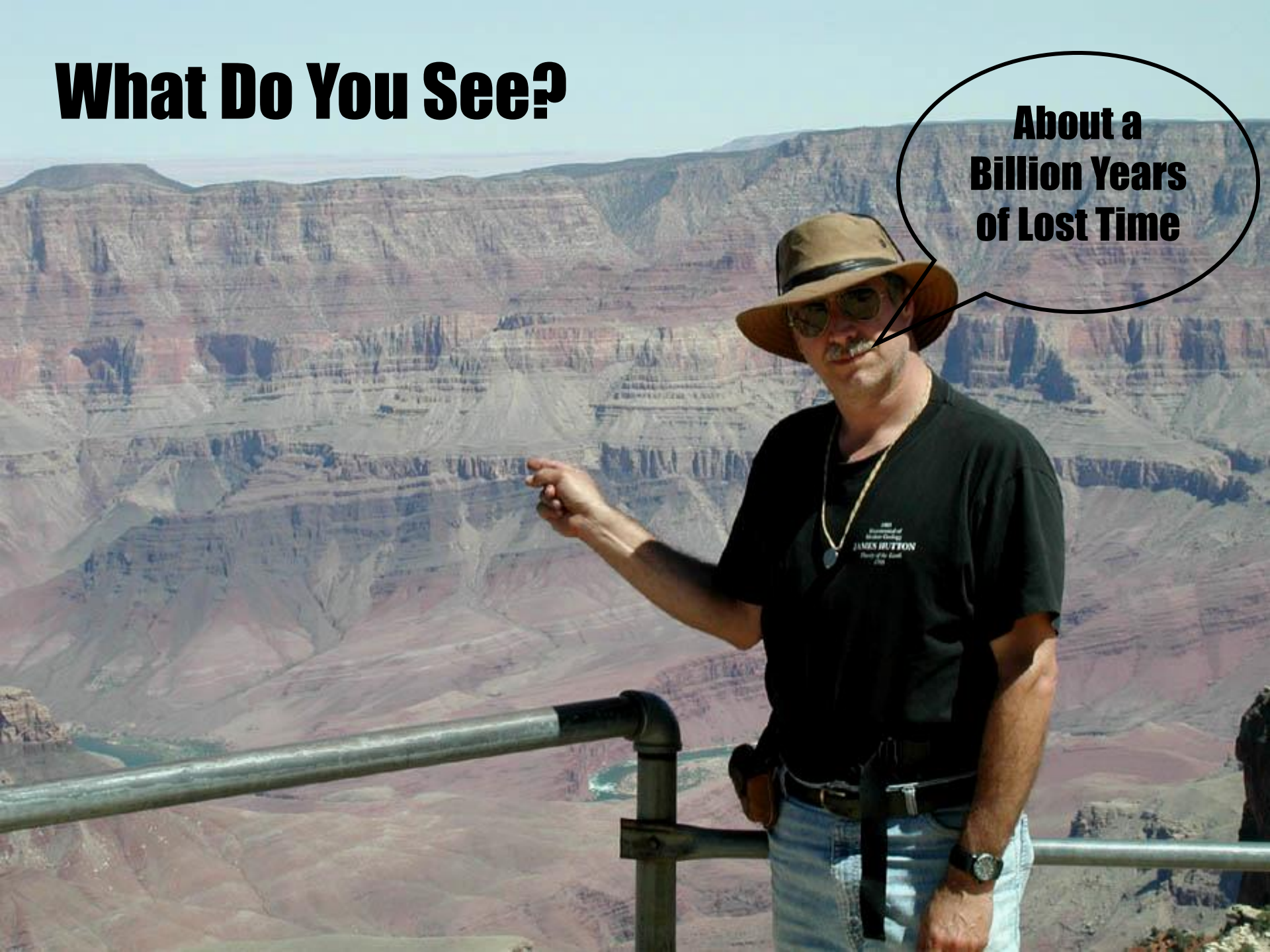

Cape Royale


Bright Angel Point


Angel's Window

What Do You See?

What Do You See?




500 Ma
1.1 – 1.25 Ga

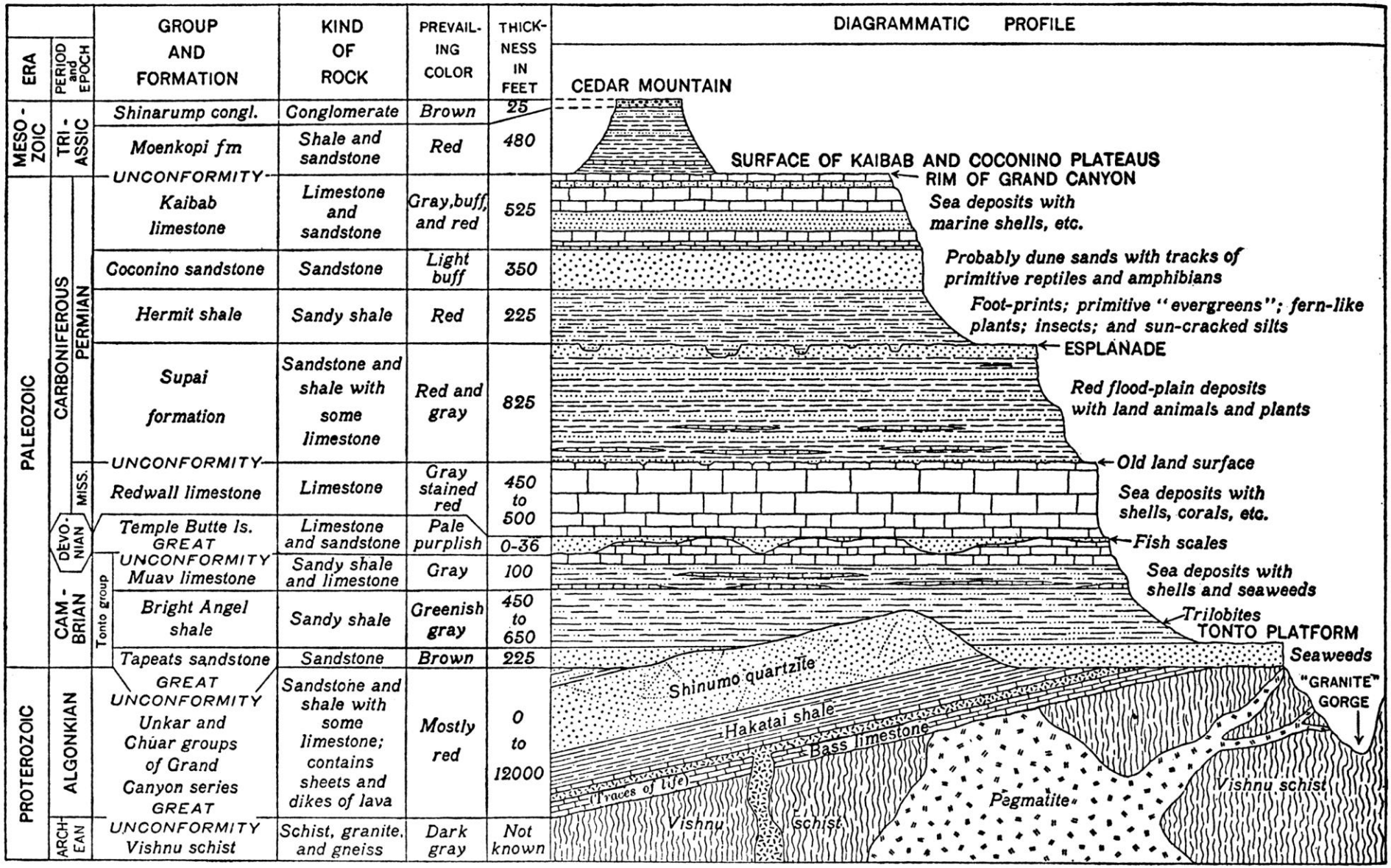
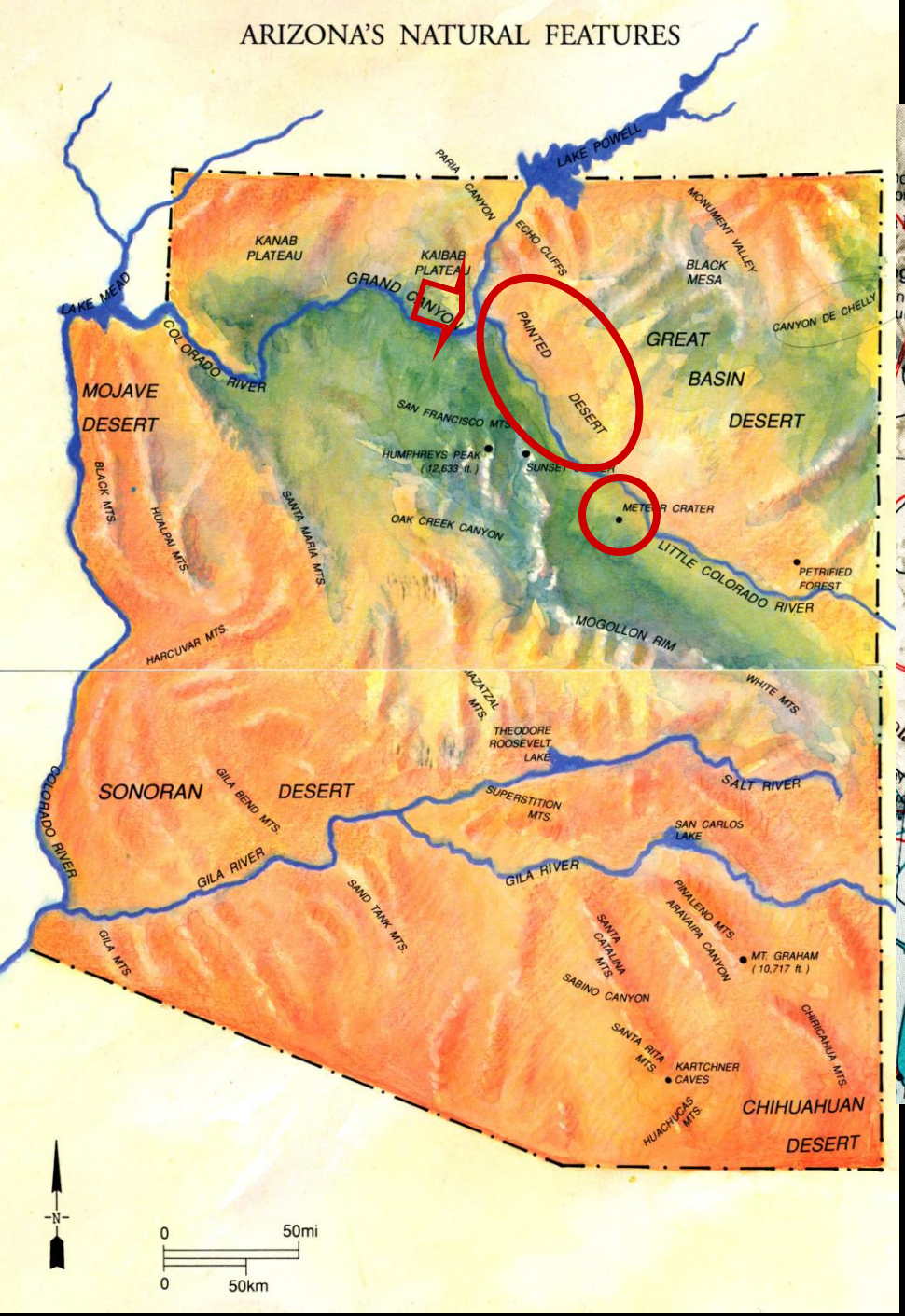


FIG. 233. Generalized columnar section of rocks forming the walls of the Grand Canyon of the Colorado. After Noble, 1924.



So, Let's Get Moving!

On The Road Through the Painted Desert to Meteor Crater

Meteor Crater News

THE SKY IS FALLING

Meteor Impact
Have Occurre
Throughout Ti

EARTH—
This news just in: meteor falls have
throughout the history of the Earth a
solar system, and they will continue t

Most meteors that make it to
face lack the mass to crea
large meteors have period
throughout our planet's
of these past craters
Earth's dynamic co
mountain building.

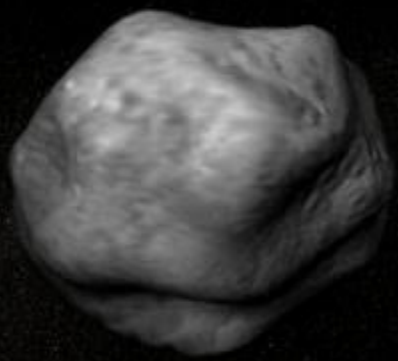
Throughout huma
falls have been common. In the 20th century alone, at least 21
have been recorded in the United States, and many more have

This drawing is based on a sketch of a 1751 meteor in Croatia. While all meteor falls provide a dramatic sight, the vast majority burn up in the atmosphere before reaching the ground. In fact, most "shooting stars" that we see are actually burning particles of dust.

Th
Ea
met
ered
Maxim


30 Ka
Meteor Crater, AZ

Fractured Kaibab Fm
Meteor Crater, AZ




Barringer QTVR
0.75 Mile Crater Created by 100’ Metallic Meteor

On The Road To the Petrified Forest

In the 1800s, U.S. Army mappers and surveyors described the "Painted Desert" and its trees turned to stone

In 1906, President Teddy Roosevelt set aside a vast region as the Petrified Forest National Monument. In 1932, 53,200 more acres were added and in 1970 50,000 acres were designated as the first wilderness in the National Park system

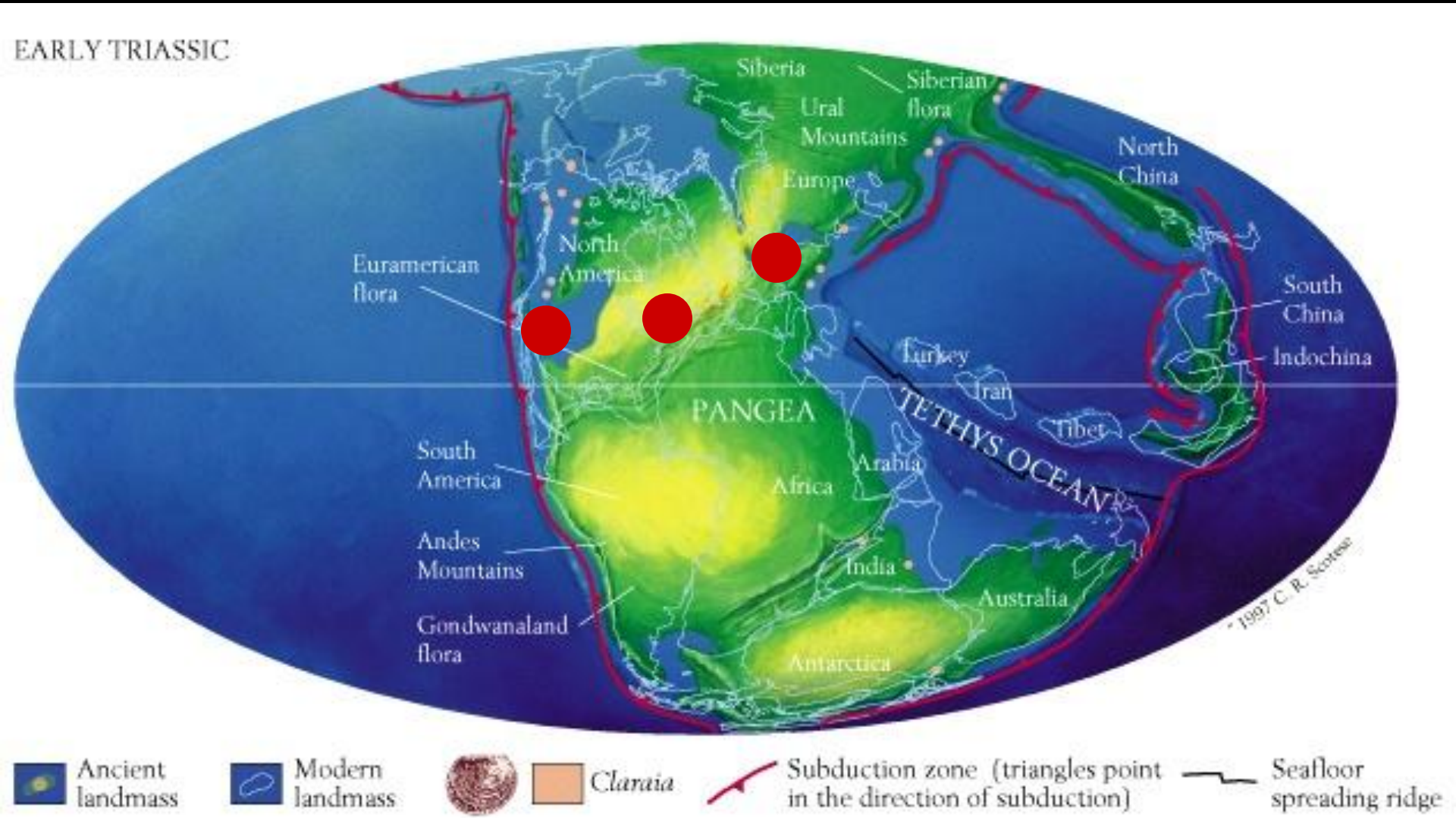

Desert conditions prevail today in stark contrast
to the former climate


Prehistoric people settled in the area about
6,000 years ago. Petrified wood provided a natural
resource that could be used or traded.


Evidence of their existence
up to A.D. 1400 remains
Petroglyphs / Tribal Comics

This high dry tableland was once a vast floodplain crossed by many streams

Muddy Strata, Rte 9N, CT



Early Triassic


Crocodile-like reptiles; giant, fish-eating
amphibians and dinosaurs coexisted

Hamminoidea hamminensis

Rare Descendant of Triassic Fresh Water Fauna

To the south, tall, stately pine-like trees grew along the headwaters

The tall trees (Araucarioxylon, Woodworthia, and Schilderia) fell and were washed by swollen streams into the floodplain.

There they were covered by silt, mud, and volcanic ash, and this blanket of deposits cut off oxygen and slowed the logs decay.

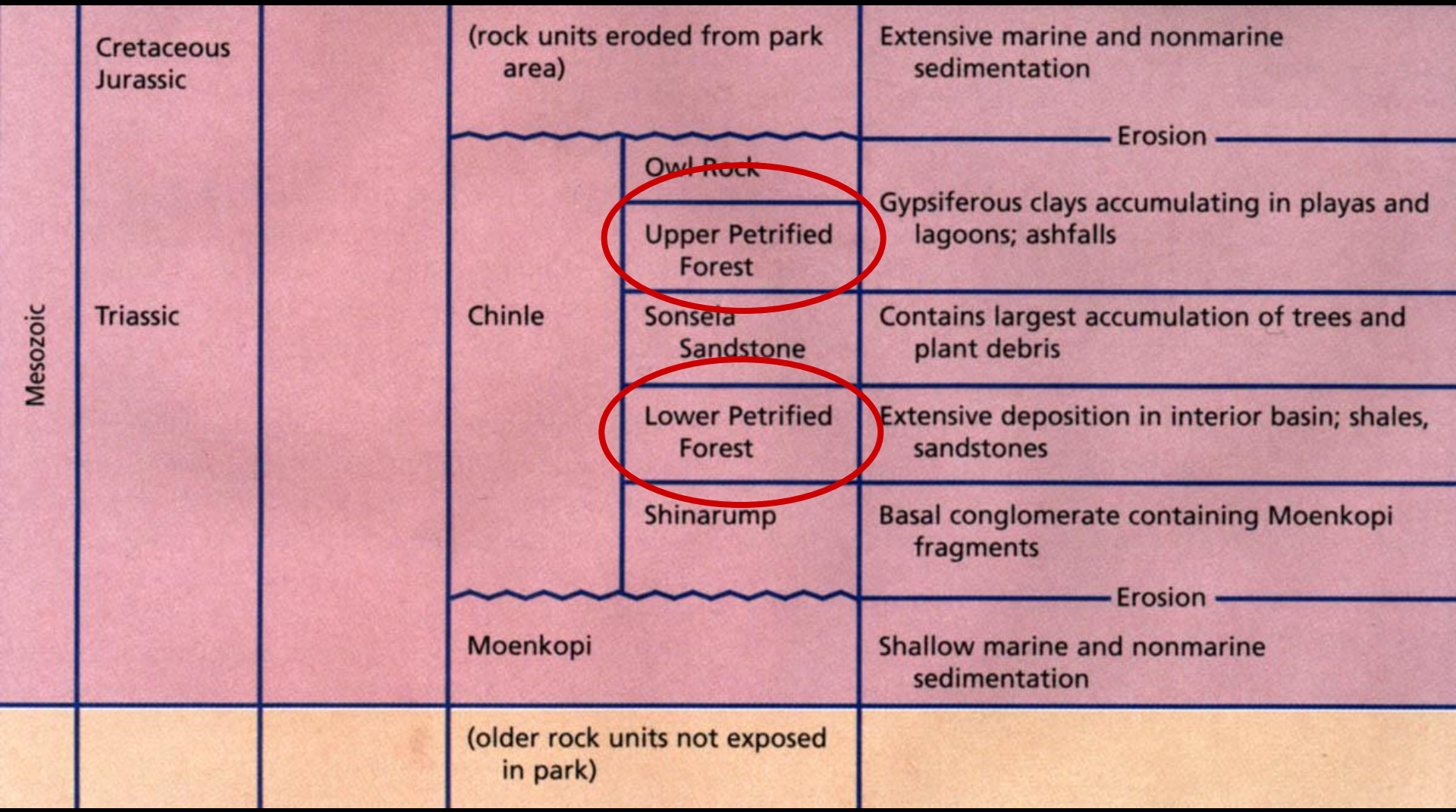

Gradually silica-bearing ground waters seeped through the logs, and bit by bit, encased the original woody tissue with silica deposits.

USGS

USGS Photo by Lyn Topinka, September 24, 1980

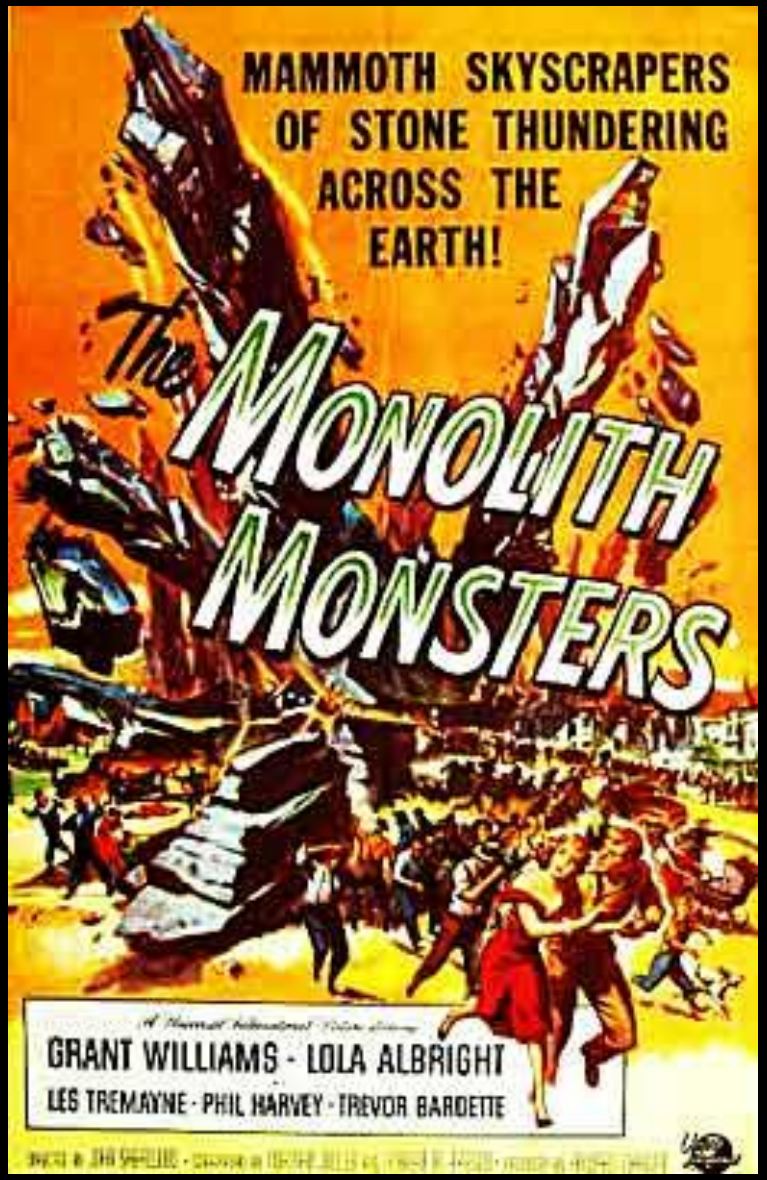
Mt. St. Helens 1980

Triassic Stratigraphy



Day by day, erosion reveals more of the petrified logs.

Well ... Are You Going to Tell Them About the Logs?


MAMMOTH SKYSCRAPERS OF STONE THUNDERING ACROSS THE EARTH!
The MONOLITH MONSTERS
GRANT WILLIAMS - LOLA ALBRIGHT
LES TREMAYNE - PHIL HARVEY - TREVOR BARDETTE


THE MOST STARTLING Science-Fiction CONCEPT

(1957)

Petrified Forest Member
Triassic Chinle Fm.

Over time the petrification process continued, silica crystallized into quartz, and the logs were preserved as dense petrified wood.

That was about 225 million years ago,
in the Late Triassic

After that time, the area sank, was flooded, and was covered with more sediment

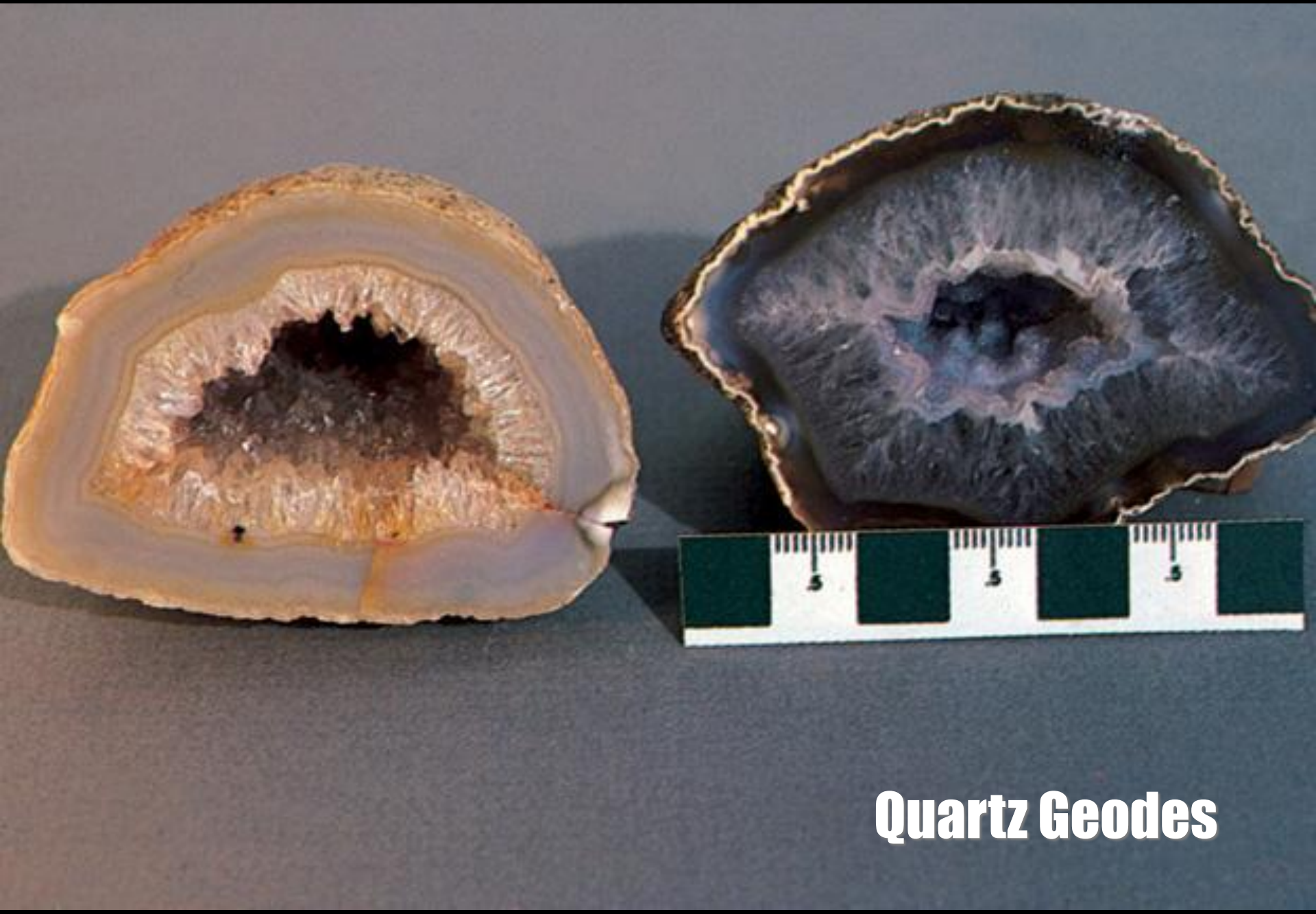

The area was then lifted far above sea level and this uplift created stresses that cracked the giant logs.

Still later, in recent geological time, wind and water wore away the gradually accumulated layers of hardened sediment

Now the petrified logs and fossilized animal and plant remains are exposed on the land surface and the Painted Desert has its present sculpted form

Silica replacement and elements such as iron, carbon, manganese, cobalt, and chromium have produced the wide range of colors

Quartz Group

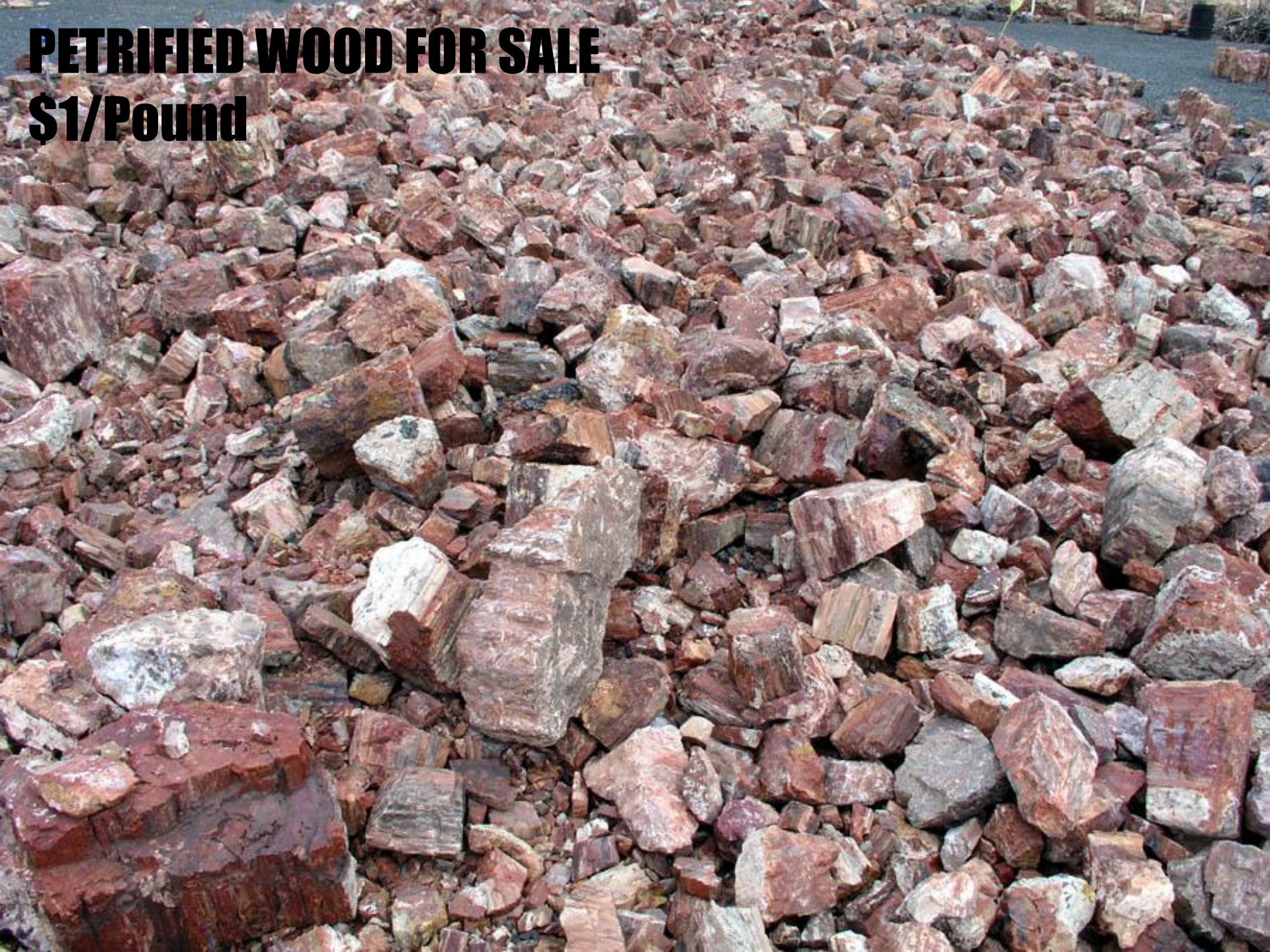

Quartz Geodes


Chalcedony

Minerals and impurities deposited while the wood was being petrified add the bright colors and preserve the interesting organic patterns

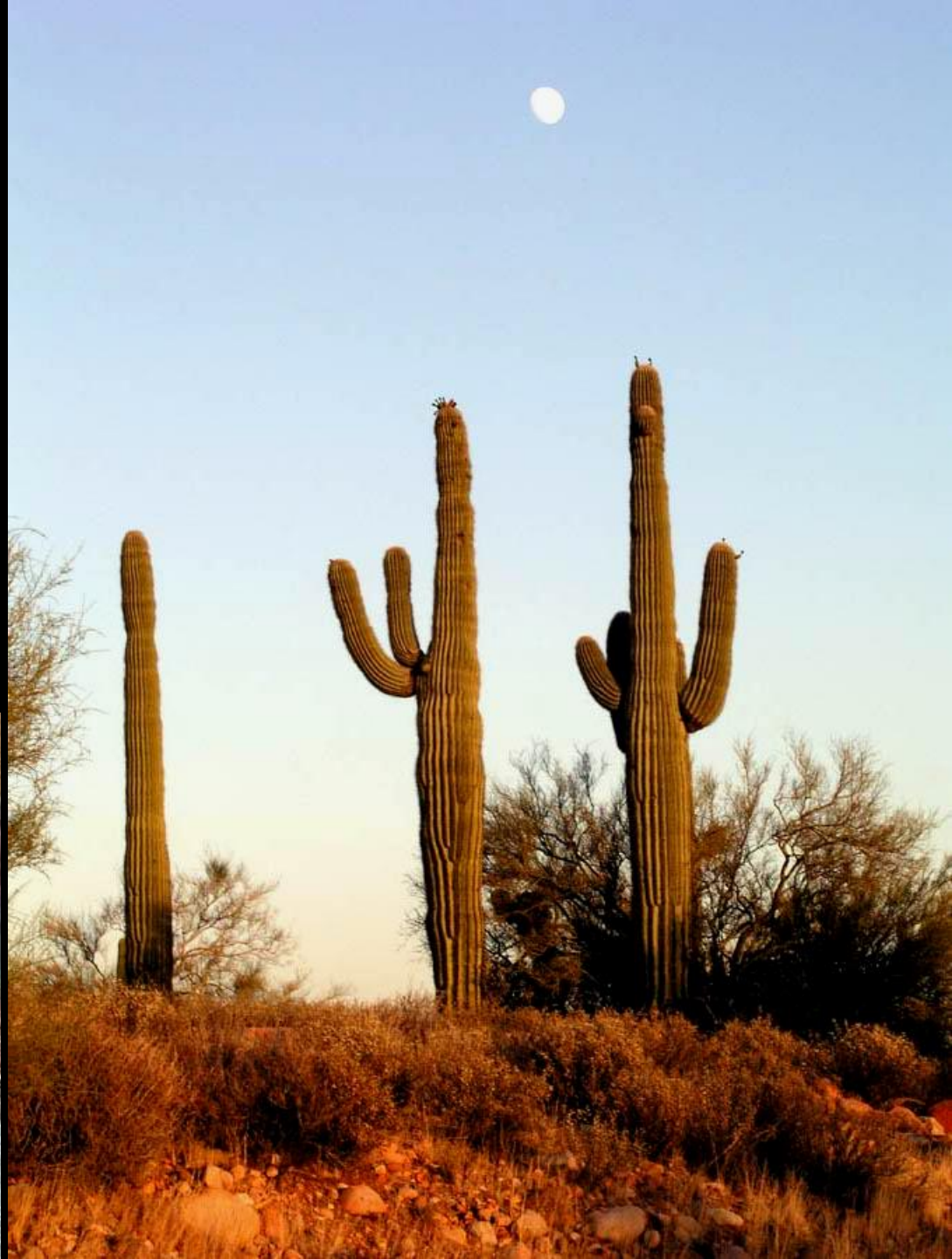
Lunch Break – While I'm Busy Show 'em Pictures of the Logs!

Upside Down, The Logs are Found to Mimic The Landscape


PETRIFIED WOOD FOR SALE
$1/Pound

Thanks For Coming to the Mineral Show!

www.dukelabs.com



The Hamfather, Part IV

Petrified Wood. The first historic record of petrified wood in this region came from a U.S. Army officer who found it near today's Canyon de Chelly National Monument, Arizona. Abundant deposits were recorded south of the present Petrified Forest National Park in the 1850's. By 1900, removal of the wood led to calls for preserving areas with large deposits of it. The park exists for this purpose and there is no collecting or giving out of samples permitted.

Petrified wood can be bought from commercial dealers who collect it from areas outside the park. The commercial wood is from the same geological deposits and of the same wood found in the park. Small pieces are sold, rough, tumbled, or polished. Artists and craftspeople work larger pieces into decorative objects. Jewelry, bookends, and clocks are popular sales items.