When Maine Was California
Faults, Volcanoes and Hot Springs in the Pine Tree State

Professor Bill Menke, Columbia University
June 23, 2014
Part 1

Everything Changes
Very Old
Great Pyramid at Giza
about 4500 years old
1 pyramid

5000 years
Imagine what Maine was like 4 Pyramids Ago?

(20,000 years)
Absolutely Nothing Was Alive in the Entire State
Elevation 1300 feet
20,000 years of exposure to the elements
2 inches in 20 thousand years
Pyramid Of 200 Pyramids

One Million Years
Pyramid Of 200 Pyramids

One Million Years
Pyramid Of 200 Pyramids

One Million Years
Start of the Ice Age
Four Million Years ago
Death of the Dinosaurs
65 Million Years ago
First Dinosaurs
240 Million Years ago
Our Story
400 Million Years Ago
Why then?
Pertica quadrifaria
Maine State Fossil
Trout Brook

Baxter State Park
Pertica quadrifaria

Trout Brook Crossing, Baxter State Park
Fly in Amber
2 inches in 20,000 years

40,000 inches in 400 Million Years
2 inches in 20,000 years

40,000 inches in 400 Million Years

About a half mile!
How can you erode a half mile off the land without it being underwater?
Part 2

Maine’s “San Andreas” Fault

brought coastal Maine to us
Norumbega Fault

North American Plate

Avalon Plate
Maine Had the Fault Stopped Moving Early
push the table

- table
- pencil
- glass of water
- floor
the legs slowly bend

glass of water

pencils

floor
the legs snap back straight

- a glass of water
- pencils

snap!  floor  snap!
snap! leg sliding on the floor, the faulting

shaking of the table, the earthquake

spilling of the water, a tsunami
2 inches per year
2 inches in a year

30 miles in a million years

126000 miles in 400 Million Years
Pertica quadrifaria
Tropical Plants
Maine on the Equator
Part 3

Maine’s “Mt Shasta” Volcanoes
gave Maine great views
California’s Active Volcanoes

Lassen Peak

Mount Shasta
Major Cascade Range Volcanoes of Washington, Oregon, and Northern California

- Mount Baker
- Glacier Peak
- Mount Rainier
- Mount St. Helens
- Mount Adams
- Mount Hood
- Mount Jefferson
- Three Sisters
- Newberry Volcano
- Crater Lake (Mount Mazama)
- Mount McLoughlin
- Medicine Lake Volcano
- Mount Shasta
- Lassen Peak

Piscataquis Volcanic Arc
Salt causes winter ice to melt
Steam causes hot rock to melt
Magma that pooled and hardened underground
South Branch Falls

Old Volcanic Ash Fall
Volcanism
Cooling
Faulting
Erosion
Uplift

“iceberg effect”
Part 3

Maine’s Hot Springs

left treasures ... or maybe problems
Calistoga Geyser
Long Valley
Undersea Hot Spring
Copper & Gold Here
Copper Ore from Blue Hill, Maine
James Irving addresses Maine mining interests at UMFK forum

By Julia Bogby, BDN Staff
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FORT KENT, Maine — Mining in Aroostook County has come at the expense of the environment, presenting a dilemma for local communities, two business groups and the LePage administration, according to a report released today.

Cheryl Johnson, executive director of the Maine Association of Counties, and New England Business Group on Health, described the impacts of mining on health care costs and services.

FBI special agent in charge John Strong said mining companies operating in Aroostook County often don't pay their employees social security taxes and therefore the businesses don't contribute their share to the payroll taxes.

Johnson said she was pleased to see the state and federal governments working together on the mining project. She also praised Irving's efforts to address the issue of mining in Aroostook County.

Johnson said the mining companies have been working hard to meet environmental regulations but there are still some concerns.

Miriam Field-Mittag, an environmental consultant with Ayers, Saint & Partners, said the companies have been working closely with the state and federal governments.

Field-Mittag said the companies have been making improvements to reduce their environmental impact, including better waste disposal and water treatment.

Field-Mittag said the companies are also investing in research and development to find new ways to reduce their environmental impact.

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Closing Thoughts

Maine was shaped long ago by geologic processes similar to those now active in California.

Had things gone slightly differently, Maine would be very different place.

Change is inevitable. We hardly notice slow change, even if profound. Only rapid change is hard to accommodate.
215 Million years ago, an asteroid hit Quebec

How different would Maine be if it had hit here, instead?

Manicouagan Crater