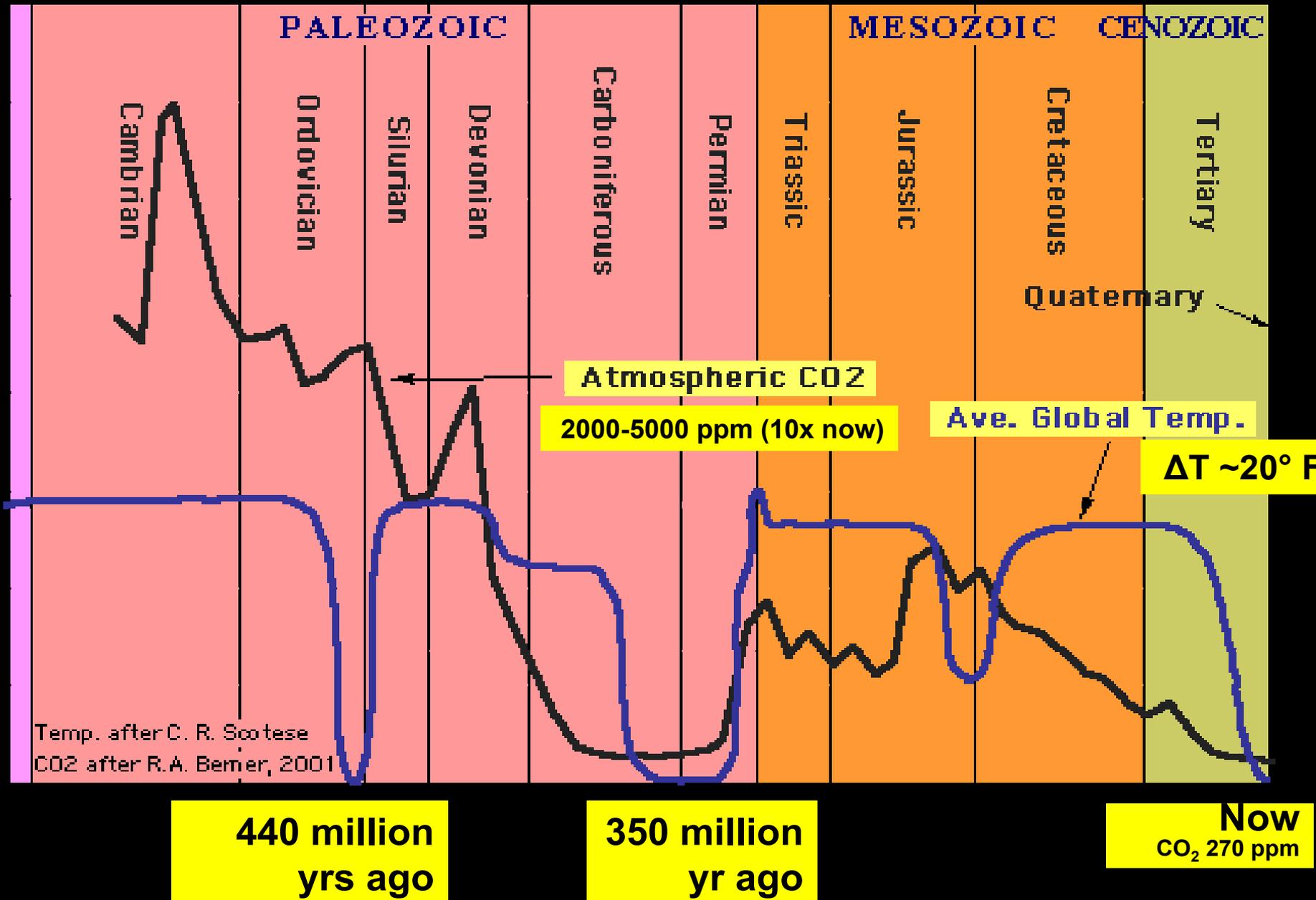


***Trouble started 70 million years ago***

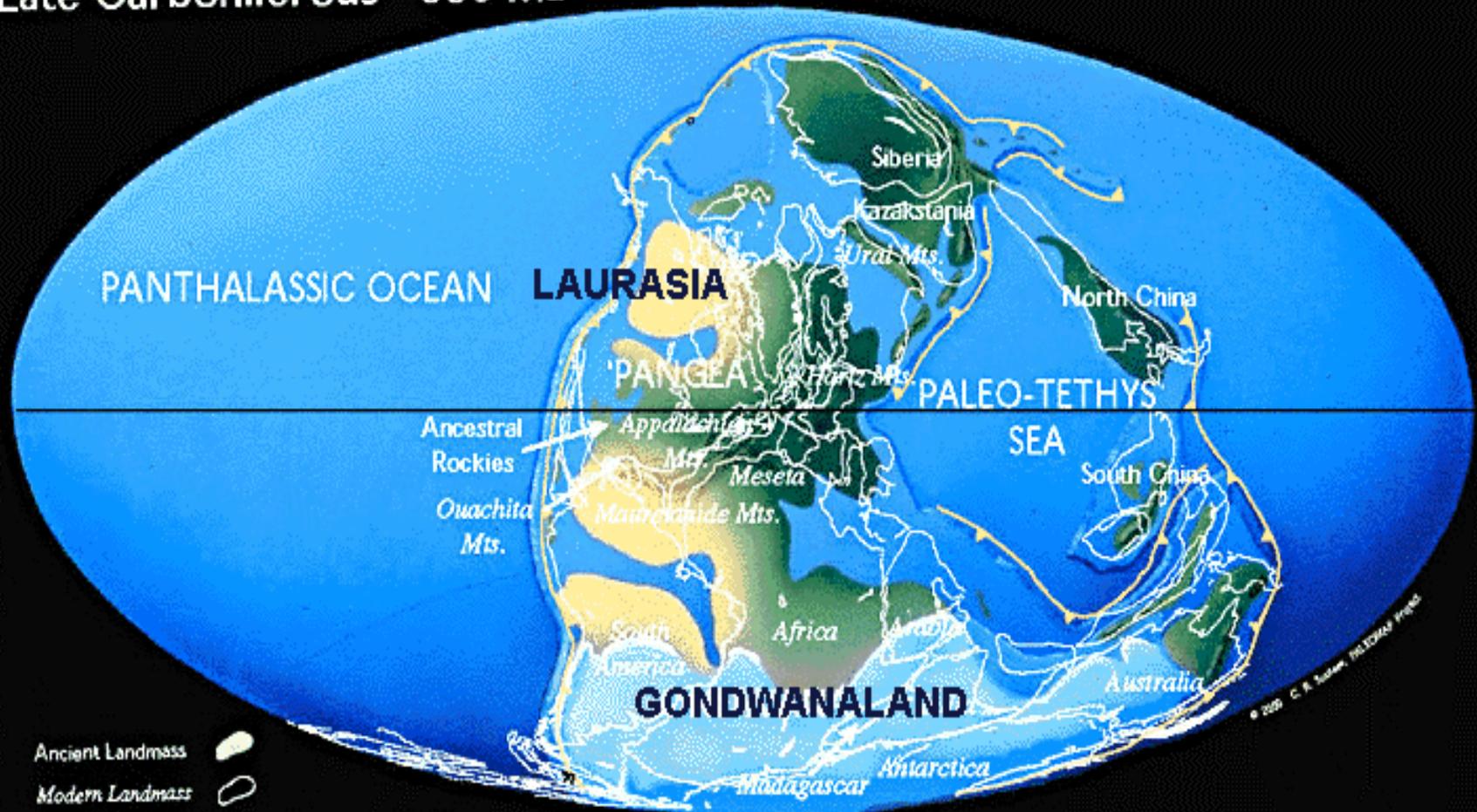


# Ice ages: Plate tectonics, volcanism, mountain building



# The Permian ice age

Late Carboniferous 306 Ma



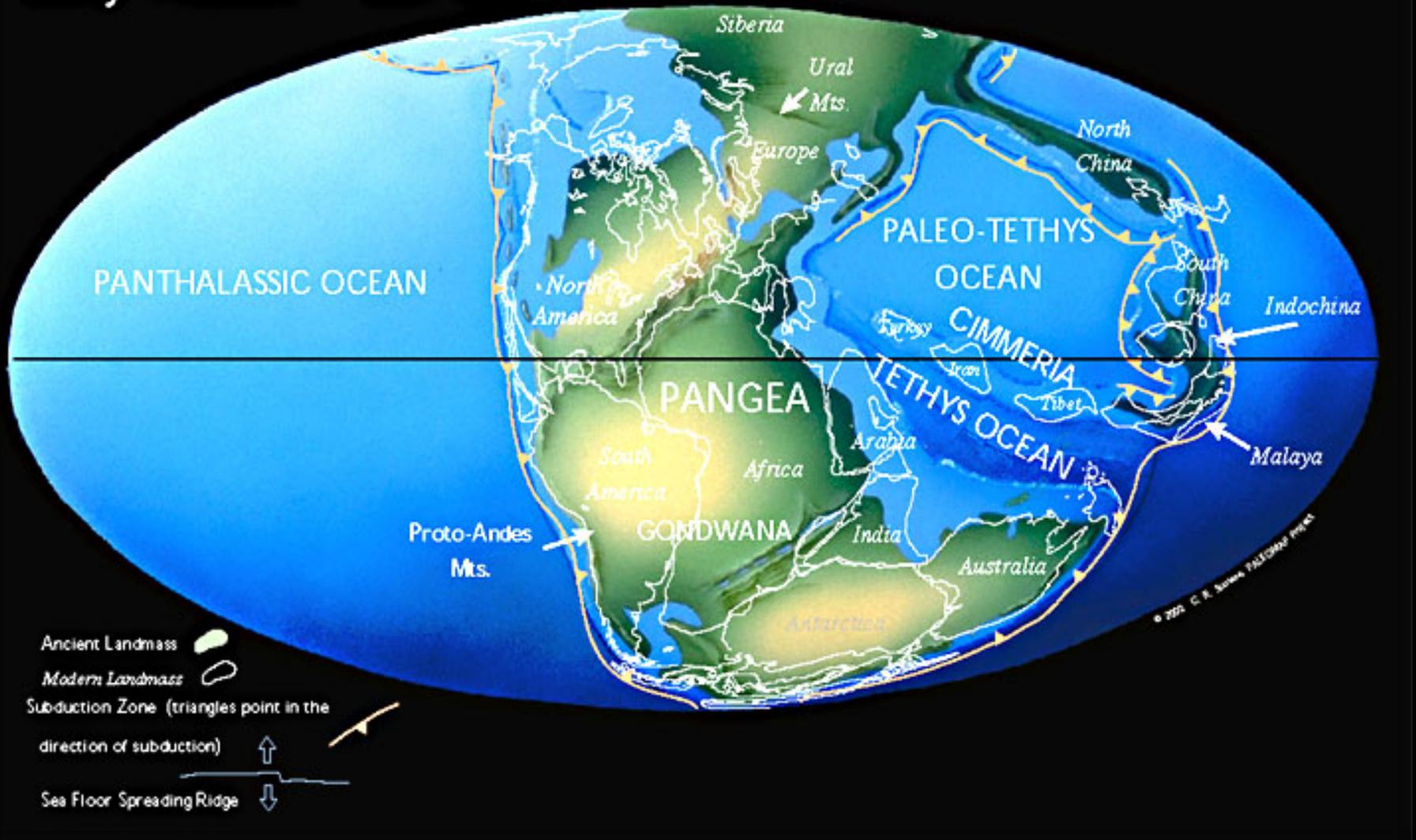
- Ancient Landmass 
- Modern Landmass 
- Subduction Zone (triangles point in the direction of subduction) 
- Sea Floor Spreading Ridge 

The "supercontinent" PANGAEA

© 2005 C. R. Scotese, PALEOMAP Pro 4.0

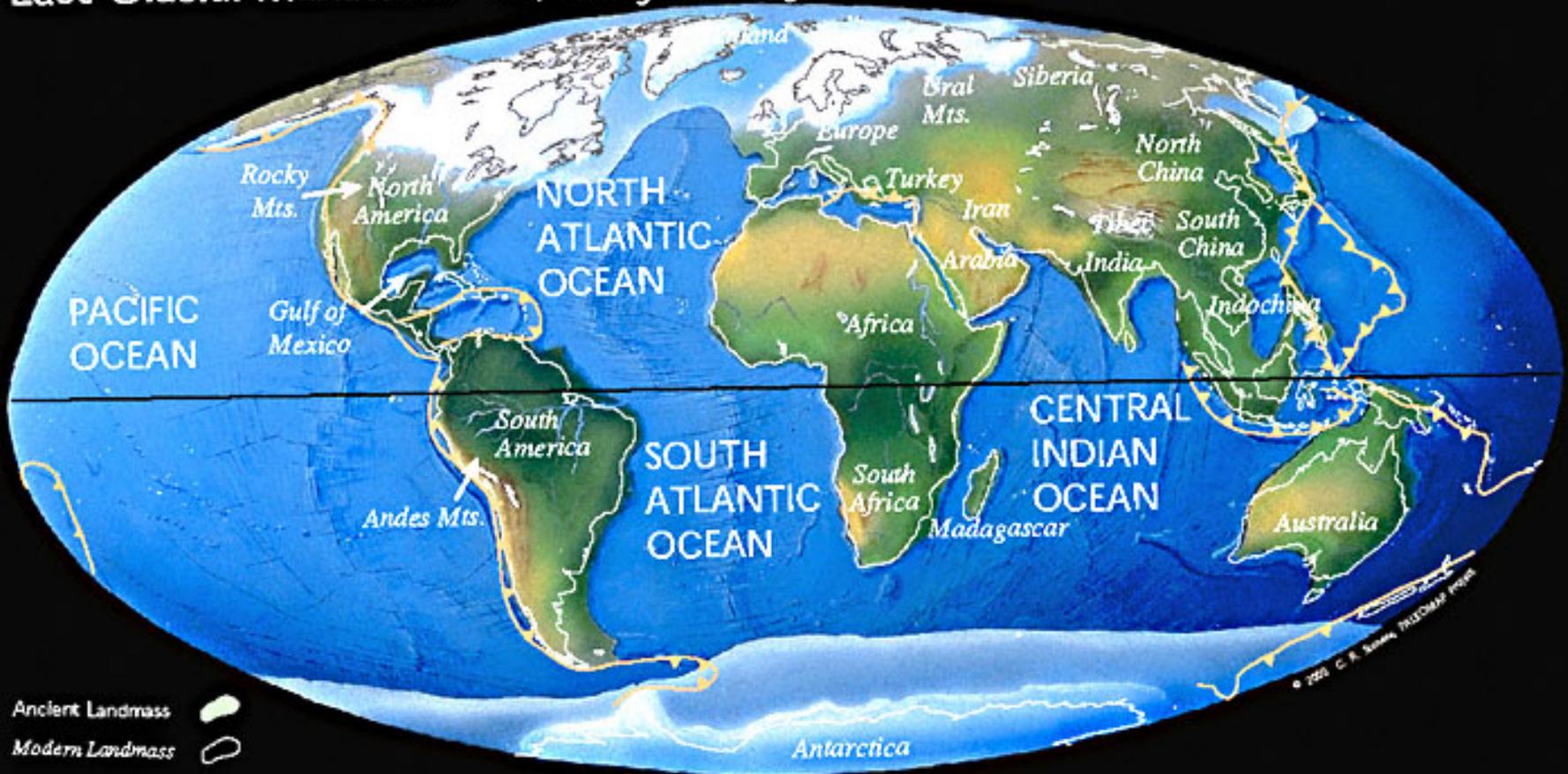
# The Permian ice age ends

Early Triassic 237 Ma



# Ice age begins anew, ca. 2 million years ago

Last Glacial Maximum 18,000 years ago



Ancient Landmass

Modern Landmass

Subduction Zone (triangles point in the direction of subduction)

Sea Floor Spreading Ridge

# Plates continue to shift the continents

Future World + 50 Ma



Ancient Landmass

Modern Landmass

Subduction Zone (triangles point in the direction of subduction)

Sea Floor Spreading Ridge

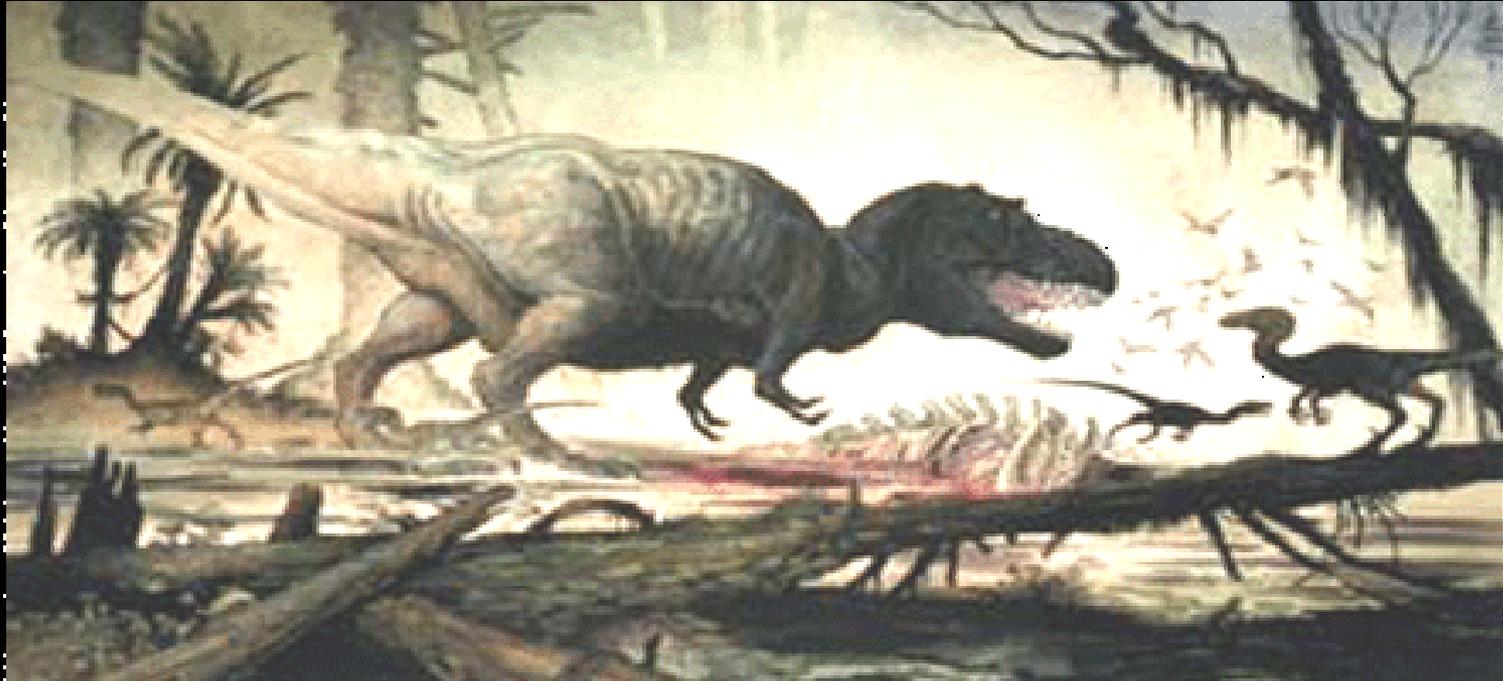
# Future hot house climate?

Future World + 250 Ma



- Ancient Landmass
- Modern Landmass
- Subduction Zone (triangles point in the direction of subduction)
- Sea Floor Spreading Ridge

# The Mesozoic – the hothouse climate!



**Weekly World News, March 5, 2004**

**SCIENTISTS WARN: *Spring won't arrive this year . . .***

**A NEW  
ICE AGE  
IS UPON  
US!**

A WORLD OF WHITE awaits us in the global deep-freeze, forecasters say.



RECORD-SETTING blizzards are already making life miserable.

# Could the Gulf Current shut down and drive the next glacial period?



***Could the Gulf Current shut down and drive the next glacial period? The Day after Tomorrow said YES!***



# Ice Age cataclysm – glacial period returns!

By GEORGE SANFORD/Correspondent

## TOP SECRET REPORT:

# PENTAGON PLANNING FOR GLOBAL WARMING CATASTROPHE

**A TOP SECRET** report prepared by Pentagon experts and suppressed by defense chiefs, warns that global warming will soon spawn catastrophe worldwide — including mega-droughts, famine and widespread rioting that will push our planet into anarchy!

Worse still, as countries desperately fight over the dwindling supplies of food, water and energy, massive “climate wars” will occur within the next 20 years that are likely to go nuclear, the shocking document maintains.

Despite all the attention given to the war on terrorism, the threat to global stability posed by global warming “vastly eclipses” that problem, conclude the Pentagon analysts.

- As early as next year, widespread flooding caused by a rise in sea levels will create major upheaval for millions of people around the world.

- Britain will be plunged into “Siberian conditions” within 20 years.

- Major European cities will soon sink beneath rising oceans.

- The widespread crop failures, famine and disease that occurred 8,200 years ago at the last time of dramatic climate change will soon be repeated.

- By 2020, shortages of water and energy will become so severe, the planet will be plunged into war.

The alarming findings may serve as a wake-up call to the Bush administration, which has repeatedly dismissed theories about glob-

strophic climate change is “plausible and would challenge United States national security in ways that should be considered immediately,” the Pentagon analysts conclude.

Environmentalists claim the White House tried to keep the report under wraps to avoid embarrassment. But now that the cat is out of the bag, experts say President Bush will have to change course radically.

Bob Watson, chief scientist for the World Bank, says the White House must take the military’s dire warnings seriously.

“Can Bush ignore the Pentagon? It’s going to be hard to blow off this sort of document,” he told *The*

FAMINE, DROUGHT & DISEASE will sweep the globe.



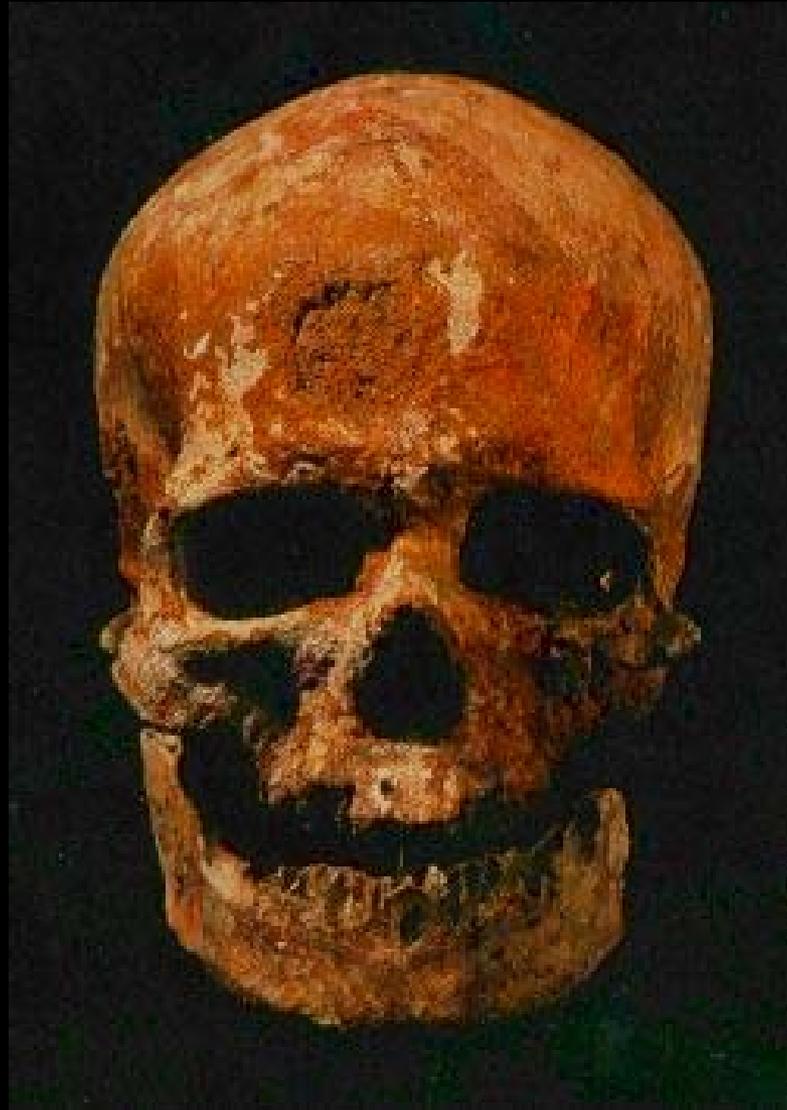
MAJOR European cities will be buried underwater.



Weekly  
World  
News  
March  
29, 2004

page 7

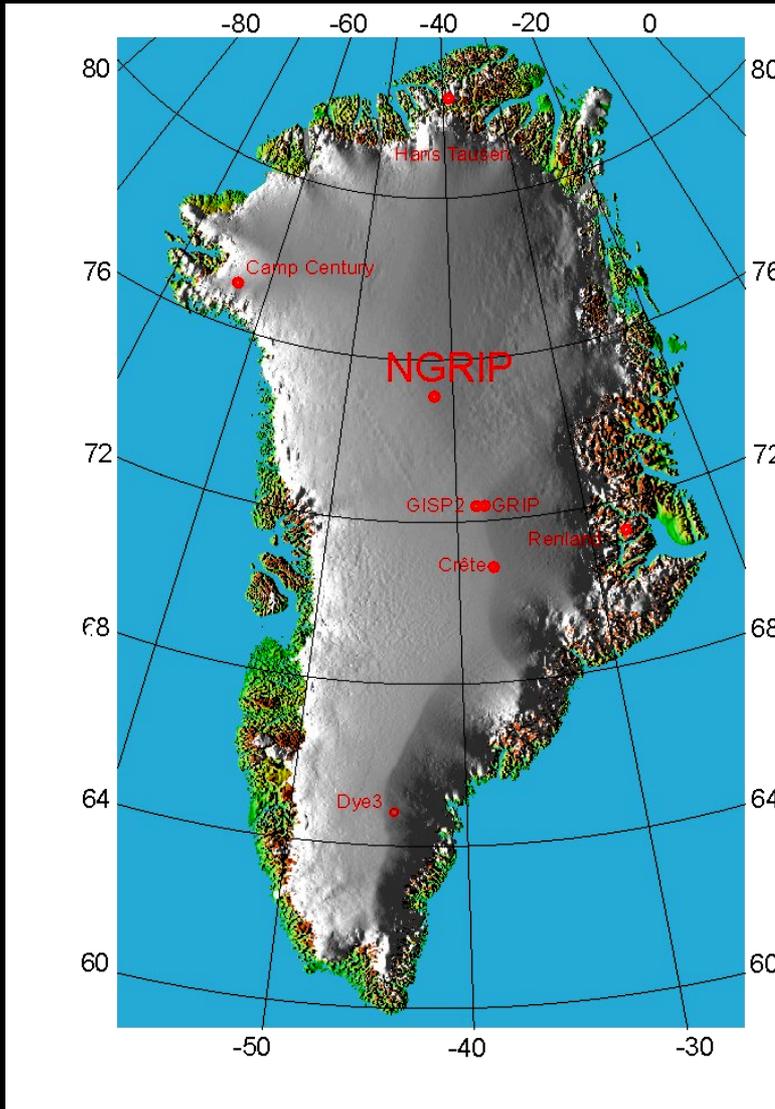
Ice age climate – *H. Sapiens* arrives 200,000 years ago,  
so *Cro Magnon* cave artists were fully human



***Woolly Rhinoceros drawn in Chauvet Cave, France,  
over 20,000 years ago – an icehouse climate***



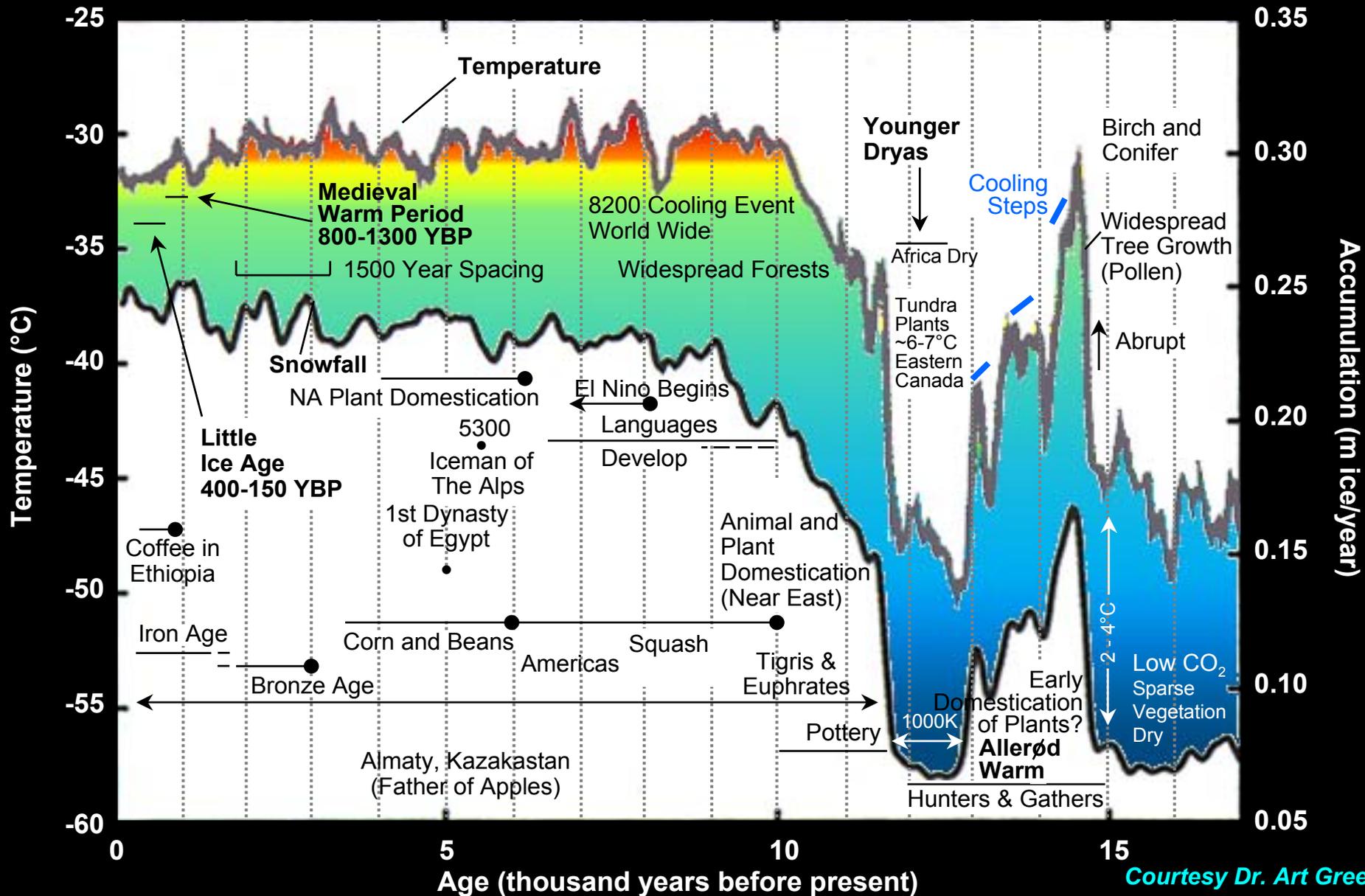
# Greenland -- ice cores



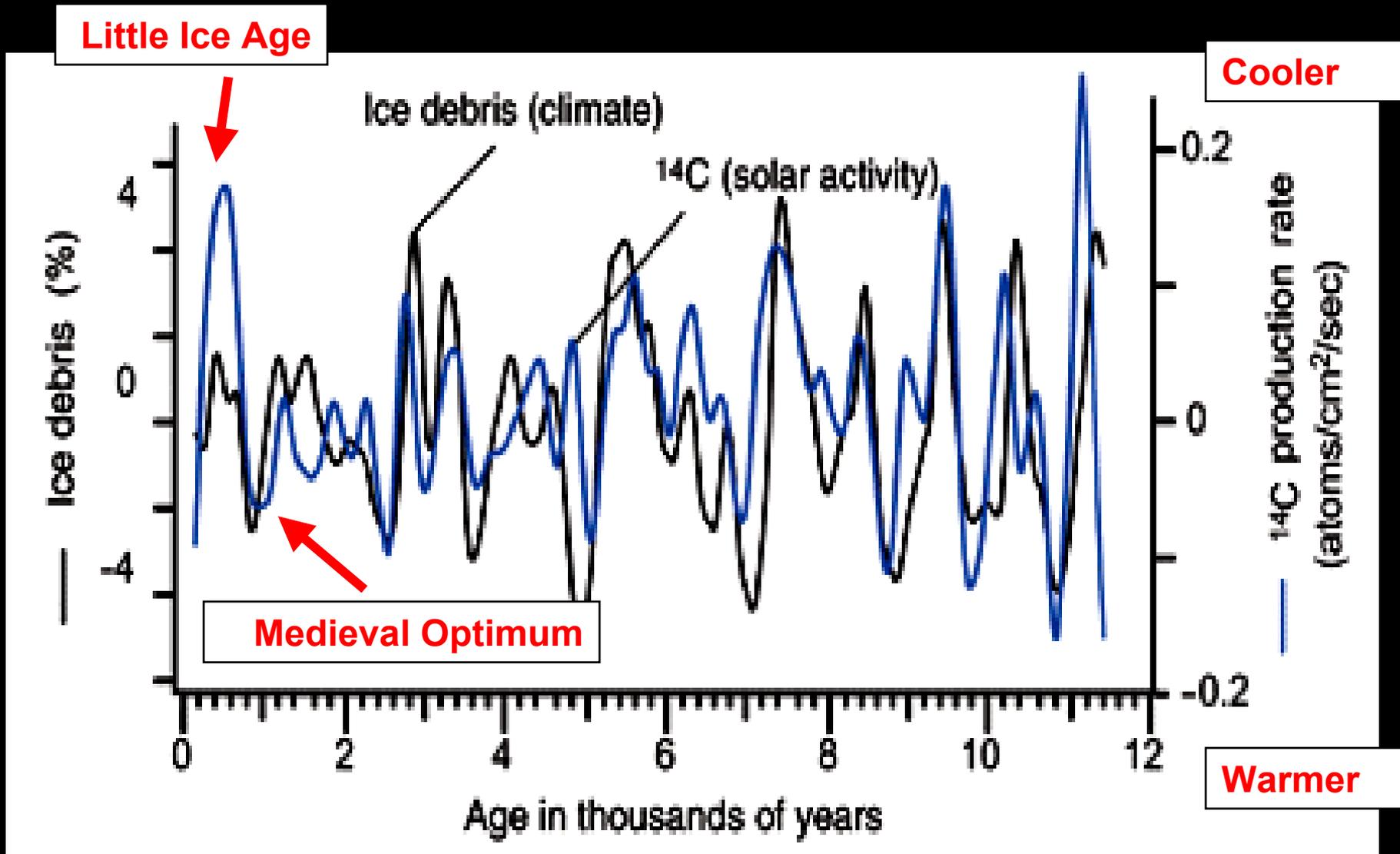
# Abrupt Changes in the Earth's Climate

Measured in Central Greenland Over the Last 17,000 Years

Paleo Temperatures & Snowfall - After Cuffey and Clow 1997 / Alley 2000

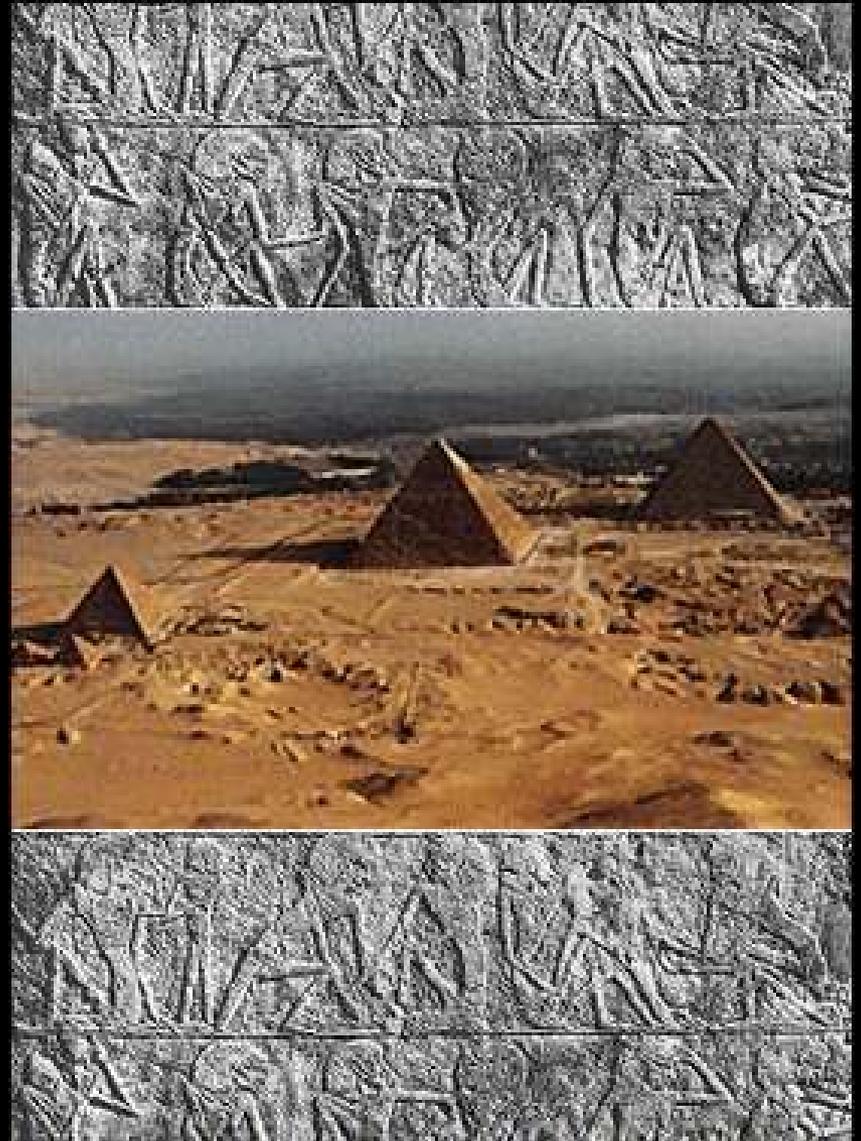


# North Atlantic sharp cold pulses paced ~1,500 years, and with sun's magnetism



From the tomb of Ankhtifi, one one of the earliest known great famines (around 2180-2130 B.C.) in Upper Egypt near Luxor:

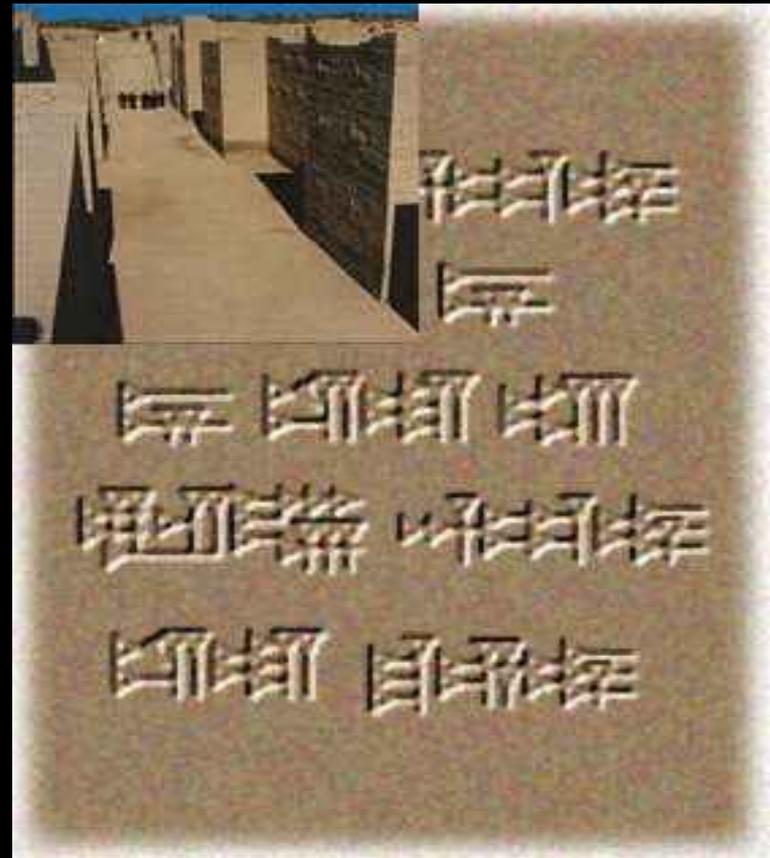
"....All Upper Egypt was dying of hunger, to such a degree that everyone had come to eating his children, but I managed that no one died of hunger in this nome [district]. I made a loan of grain to Upper Egypt.... I kept alive the house of Elephantine during these years...."



*Courtesy of Prof. Tim Patterson, Carleton University*

## *Assyria's King Ashurbaniapal (7<sup>th</sup> c B.C.) collects old Sumerian tablet for his library – flood in Gilgamesh Epic*

Legends of an ancient flood also existed in Babylon, where a fragment of the account in an inscription dated as early as the 19th century B.C. has been found.



*Courtesy of Prof. Tim Patterson, Carleton University*

# *5,000 year old spruce snag in Canadian Arctic*

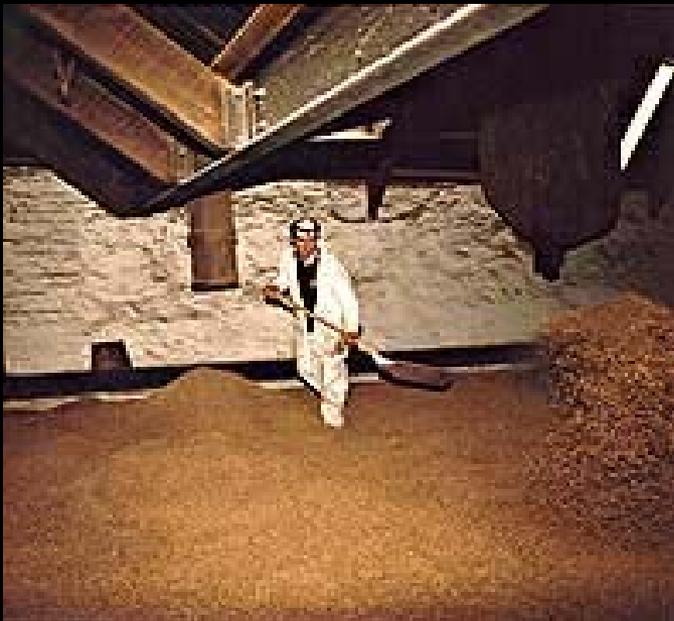


J. C. Ritchie, Scarborough College, Toronto University

***Bogs are mossy wetlands in cool rainy regions***



# *Scotch whisky from barley roasted over peat*





***Bruichladdich 40 Year Old  
The Oldest Bruichladdich  
Ever Bottled  
1964 - 500 Bottle Worldwide  
Cask Strength of 43.1%  
Islay bottled  
Caramel free  
Non Chill filtered***

***Price: £1,000.00 (Including:  
VAT at 17.5%)***

*Layers of pollen in bogs detail past climate*

Hazel



Grass

Pine



***Lindow Moss Man II  
discovered 1984  
England***

# *Jutland's Tollund Man died 2,400 years ago*



SILKEBORG MUSEUM OF DENMARK

# *Tolkien raised in Birmingham – with its two towers*

*Perrott's Folley, built 1758 –  
Orthanc, Black tower of Isengard?*



*Edgbaston Waterworks – Minas  
Morgul?*



[www.virtualburm.co.uk/tolkien.htm](http://www.virtualburm.co.uk/tolkien.htm)

# *Tolkien in World War I Battle of Somme, France and the Dead Marshes*



*New Line Productions, Inc.*

<http://www.greatwar.nl/frames/default-tolkiene.html>

<http://www.lordoftherings.net/>

# *Wild fire in 1297 C.E.*





Foxtail pine snag  
lived 1000 years ago  
above present tree  
line near Bighorn  
Plateau, Sequoia  
National Park,  
California

A. Bunn 2003 *Sierra Nature Notes*, 3

# **Trees in Polar Ural Mountains grew at higher elevation about 1,000 years ago**

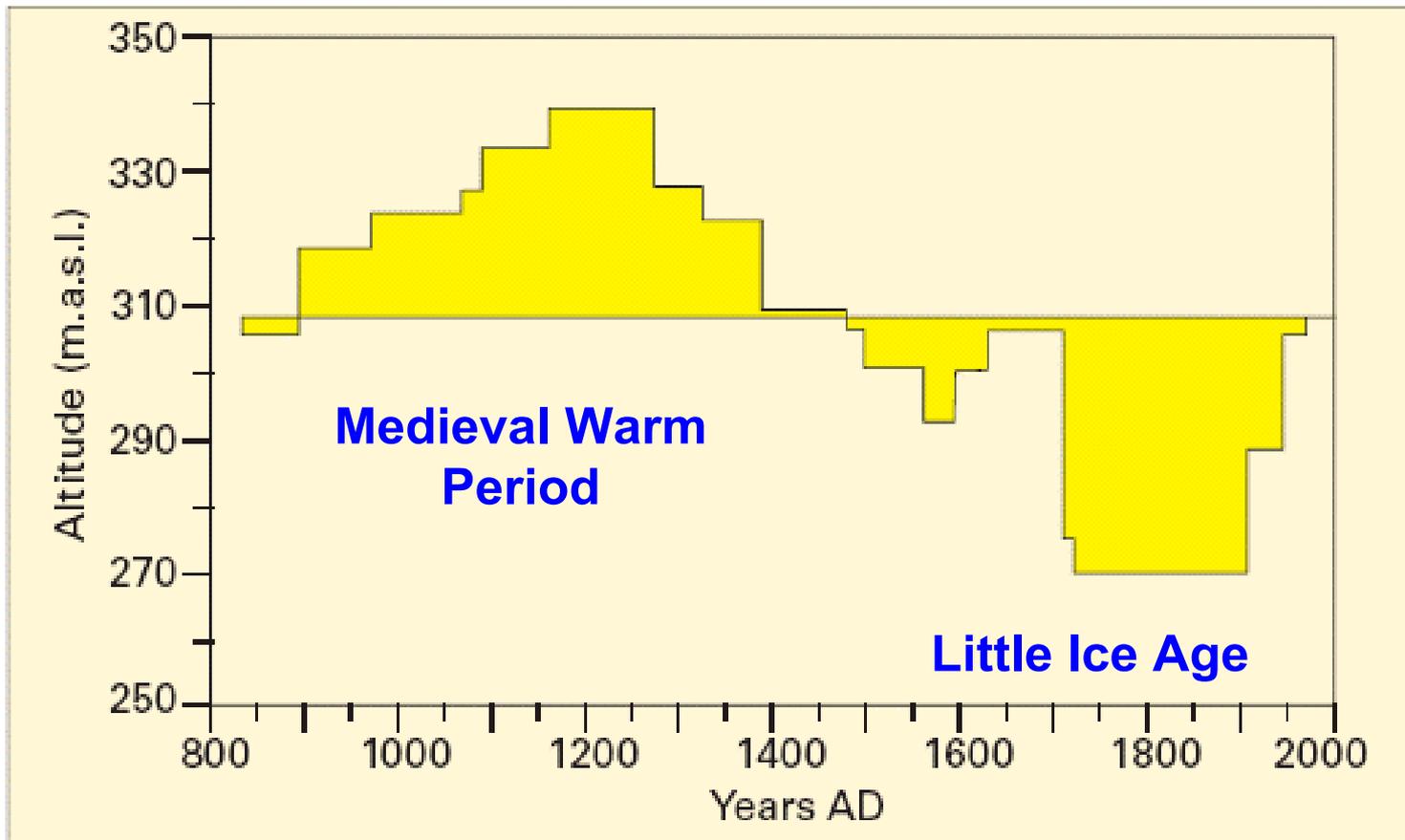
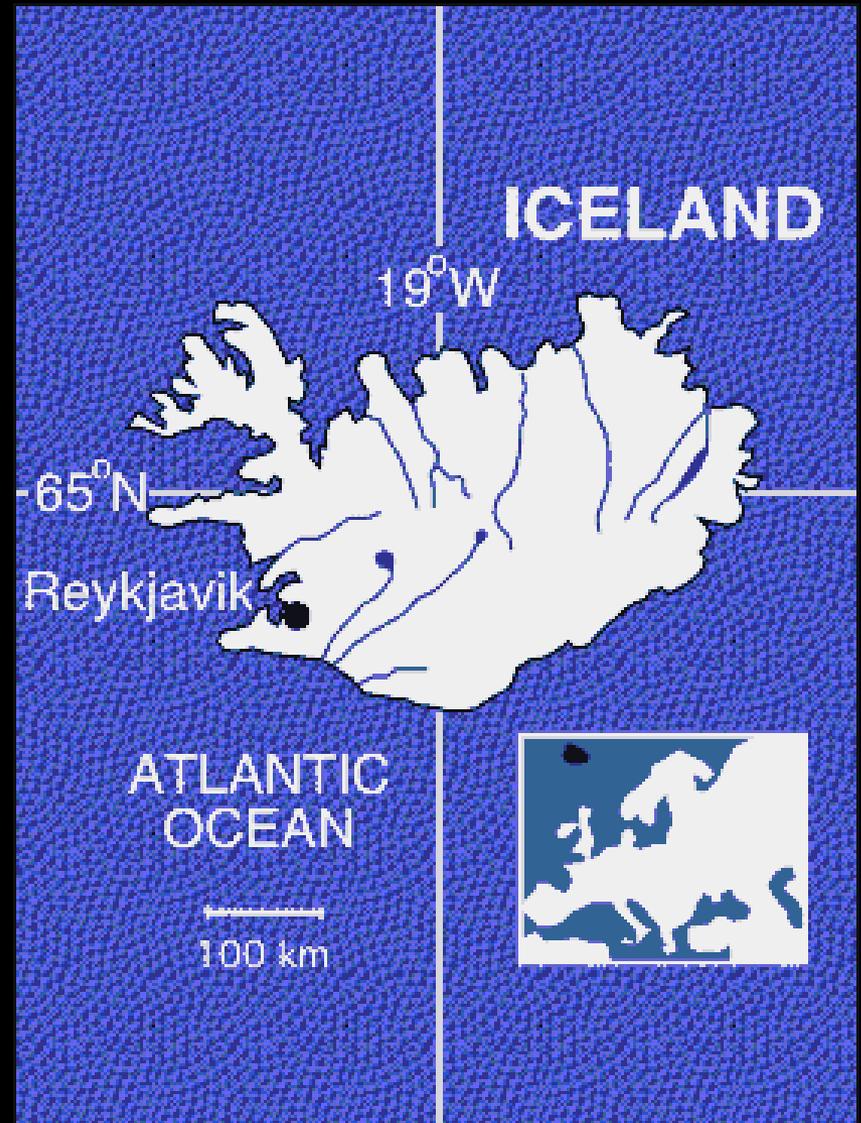


Fig. 1. Altitudinal displacement of the upper treeline in the Polar Ural Mountains during the last 1150 years.

Irish monks found considerable ice in waters to Iceland in the 6th to 8th centuries and as late as A.D. 865.

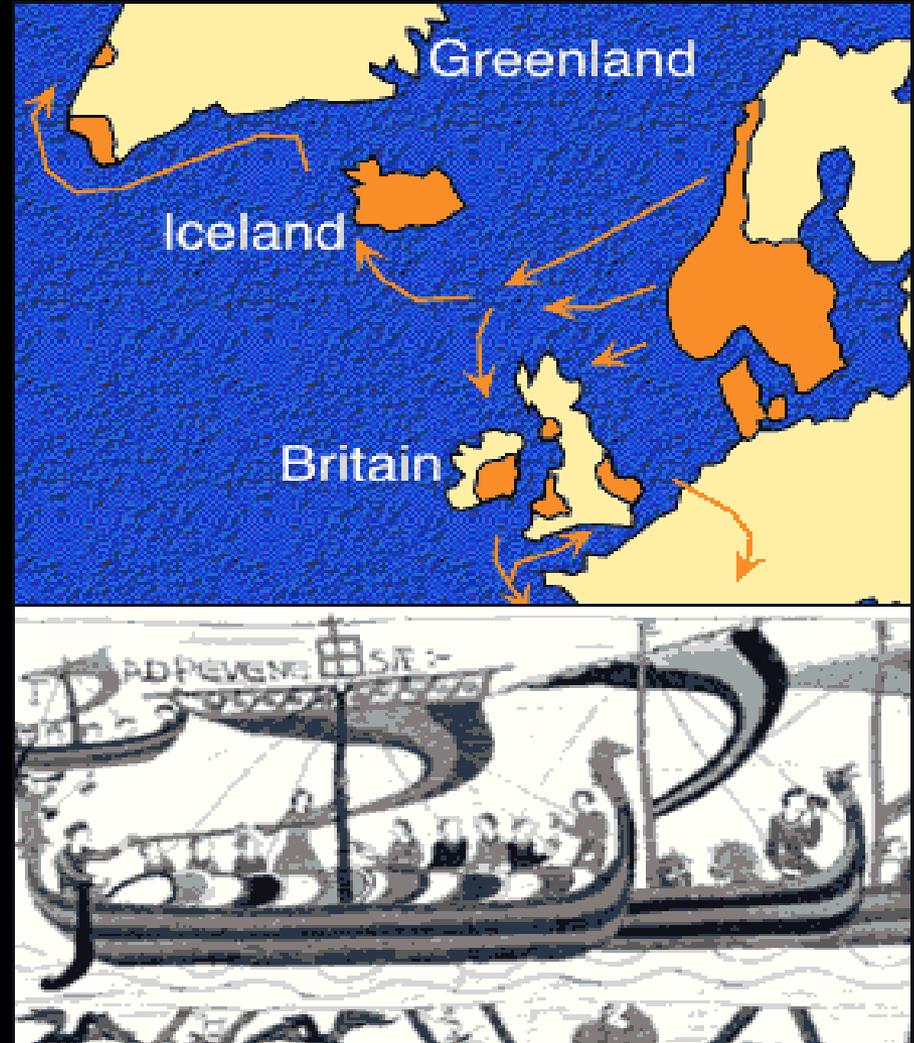
The Viking settlers found no ice in Icelandic fjords from that time until A.D. 1200.



*Courtesy of Prof. Tim Patterson, Carleton University*

By A.D. 1250 the King's Mirror (Konungs Skuggsjá) writes that the East Greenland ice was formidable.

By A.D. 1342 the old sailing route along the 65 degrees N used to reach the Greenland colonies had to be abandoned because of the increase in ice.



*Courtesy of Prof. Tim Patterson, Carleton University*

***Modern ruins of  
Hvalsey  
Church, Viking  
Greenland  
colony***



# *Hvalsey Church, Greenland, by 1500*



The situation worsened further as recorded in a letter to Pope Alexander VI in 1492:

" ...the church of Gardar is situated at the ends of the Earth in Greenland, and the people dwelling there are accustomed to live on dried fish and milk for lack of bread, wine and oil ... shipping to that country is very infrequent because of the extensive freezing of the waters -- no ship having put in to shore, it is believed, for eighty years -- or, if voyages happened to be made, it could have been, it is thought only in the month of August ... and ... it is also said that no bishop or priest ... has been in residence for eighty years or thereabouts ... "



*Courtesy of Prof. Tim Patterson, Carleton University*

Little Ice Age in Europe, circa 13<sup>th</sup> – 19<sup>th</sup> centuries, saw *highly variable* weather with harsh winters...



...overly wet summers  
or severe heat and  
drought (“burnt hay”)



*Courtesy of Prof. Tim Patterson, Carleton University*

Famines swept E. Europe in the 14th century.

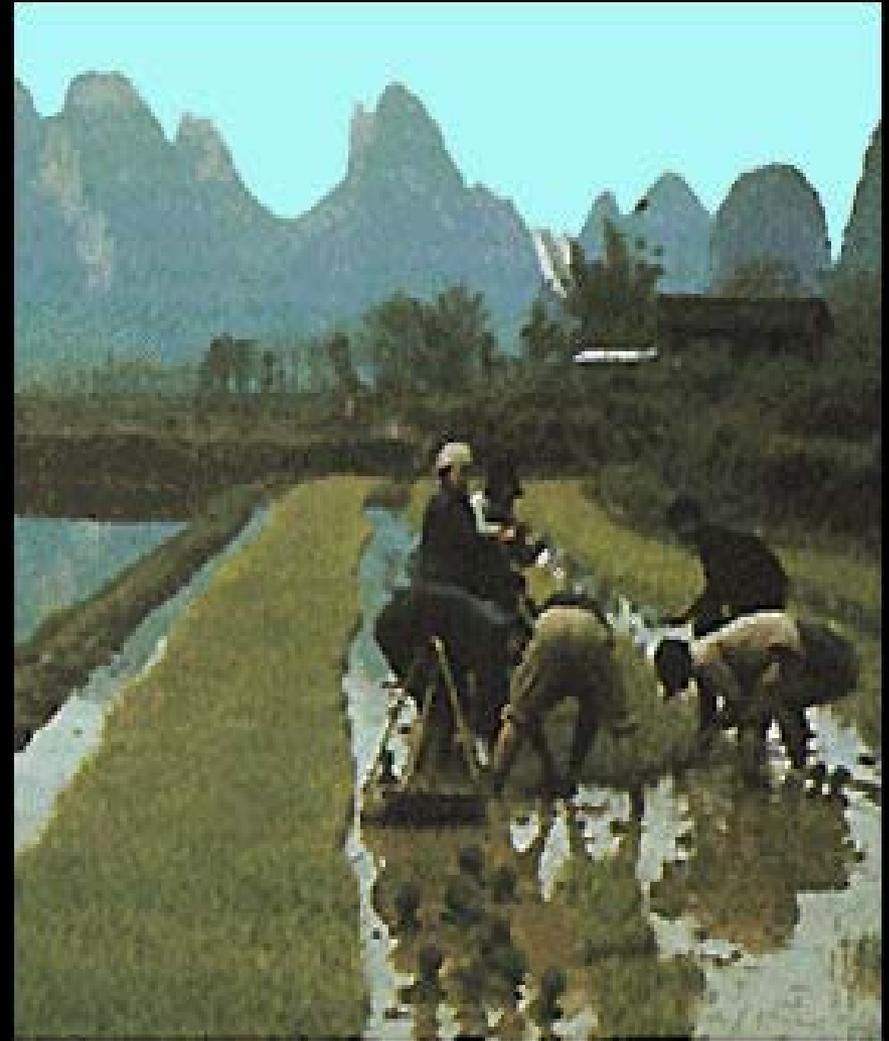
People were forced into cannibalism. Others fled to the west.

Chronicles of the monasteries in Poland and on the plains of Russia report events that make for terrible reading.



*China suffers during Little Ice Age, beginning in 13<sup>th</sup> century*

Chin Li-Hsiang (A.D. 1252-1303) studied evidence of the pattern of cultivation in China during the Chou, Chin and two Han dynasties (900 B.C. - A.D. 220) and determined that the climate then had been rather warmer than in his own time.

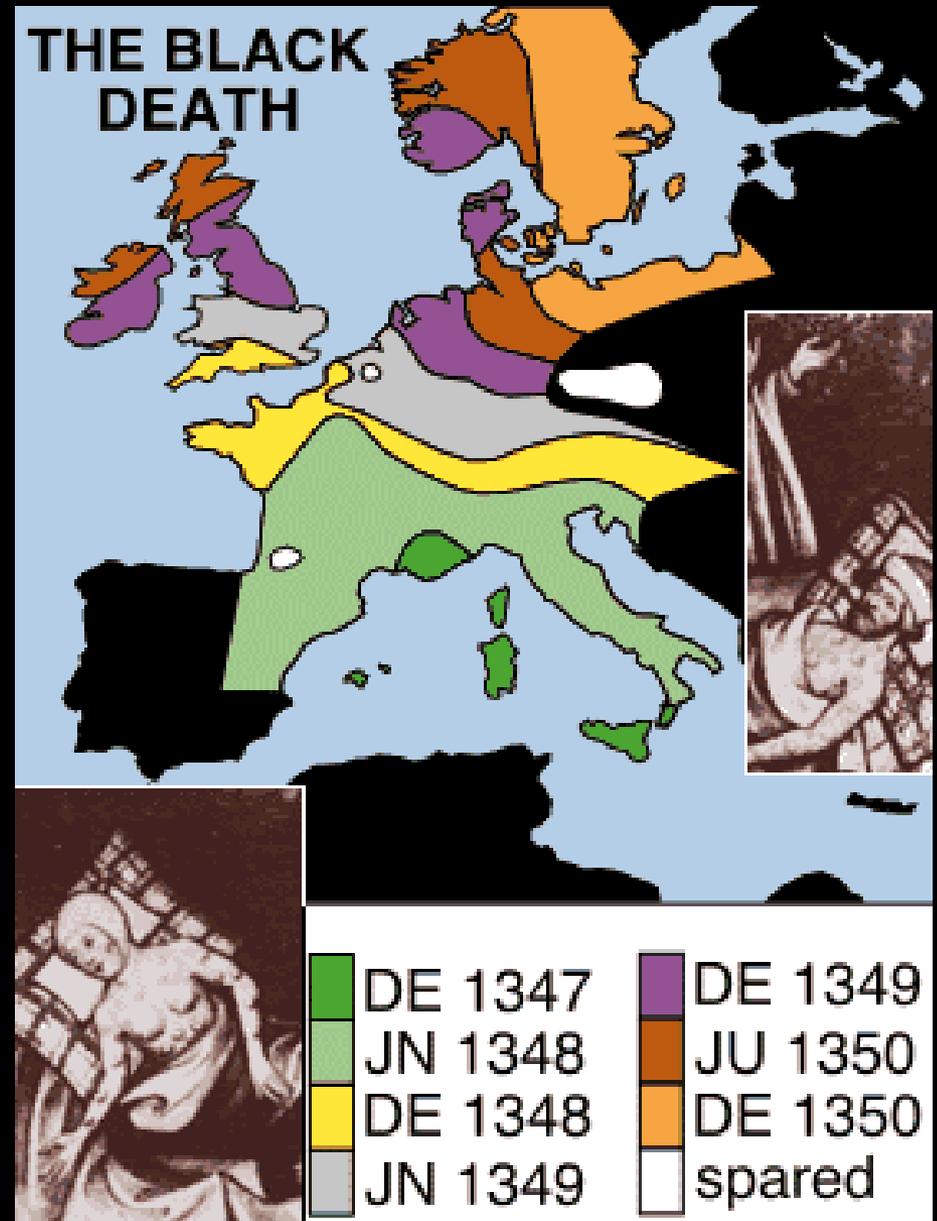


*Courtesy of Prof. Tim Patterson, Carleton University*

***Worst weather disaster ever: Chinese flooding in 1331-32 kills 7 million***



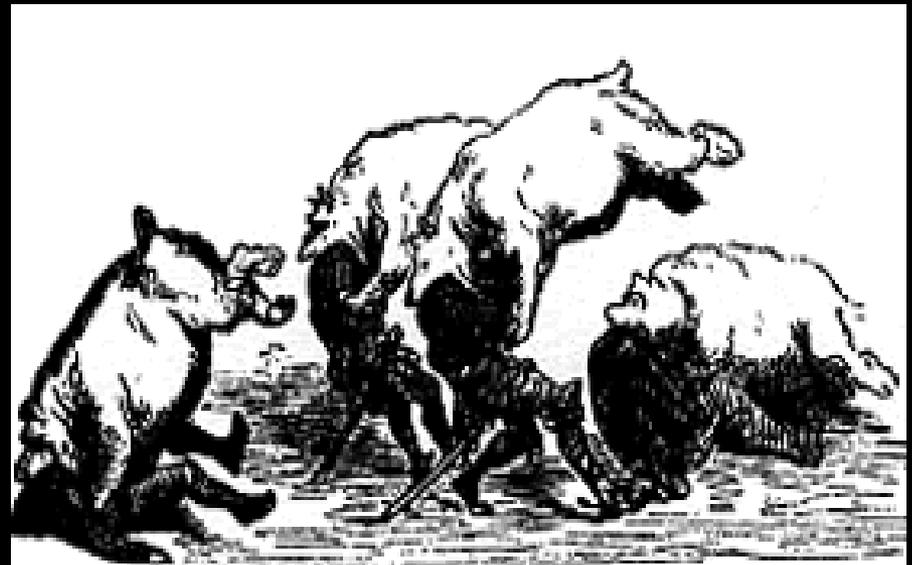
The Black Death (the bubonic plague of 1347-50) struck an already starved population and killed as much as 40 percent of the European population!



Weather calamities culminated in E. Europe during the 15-16th centuries. Famines became more severe than ones earlier.

An example of events that transpired comes to us from Smolensk in 1438:

" .... and the wild animals ate people and people ate people and small children."



*Courtesy of Prof. Tim Patterson, Carleton University*

**1540 in Basel “wart ouch der Rin so klein, dasz man uff dem grien oder boden usz der kleinnen stat [aus Kleinbasel] bisz [...] zur halben brucken trocken gon mocht underthalb und oberthalb der brucken”**

**<http://hanserren.cwhoutwijk.nl/co2/errenvsluterbacher.htm>**



**<http://myswitzerland.igougo.com/photogallery/displayFeaturePhoto.asp?ID=74223>**

# *Severity of Little Ice Age*

The extent of ice on land and sea exceeded that at any other time since the last glaciation.



*Courtesy of Prof. Tim Patterson, Carleton University*

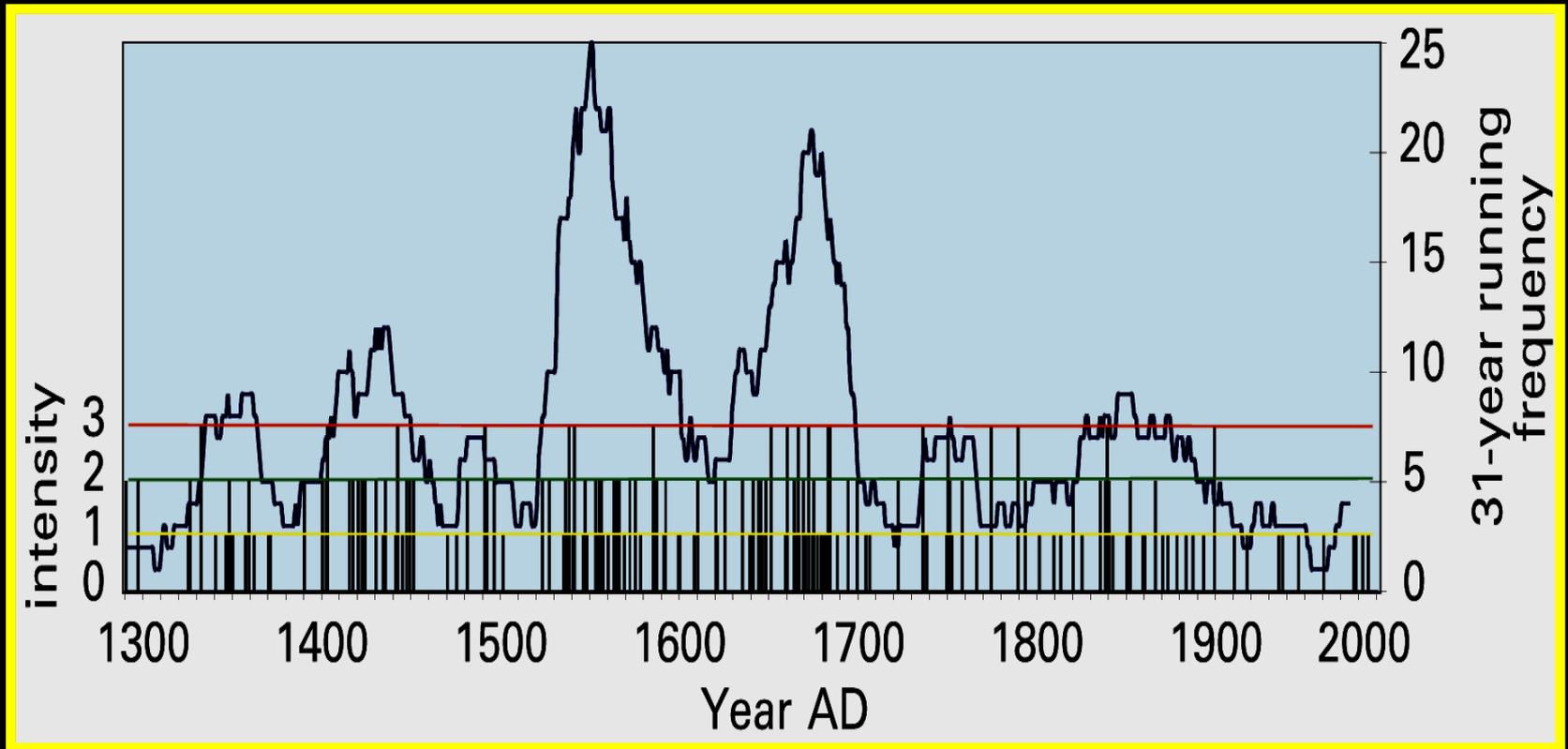
# Severe winters in the Little Ice Age – 17<sup>th</sup> century



van Ostade 1610-1685  
Dutch landscape painter



# *Pegnitz River – flooding peaks in Little Ice Age*



# **Seven (of Ten) Common Errors and Myths about the Witch Hunts**

***Prof. Brian A. Pavlac, Kings College, History***

- 1. The Witch Hunts were an example of medieval cruelty and barbarism.***
- 2. The Church was to blame for the Witch Hunts.***
- 3. The Witch Hunts specifically targeted women.***
- 4. The Witch Hunts were all alike.***
- 5. Millions of people died because of the Witch Hunts.***
- 6. People condemned during the Witch Hunts were burned at the stake.***
- 7. During the time of the Witch Hunts, witches actually existed and worked magic.***

# *Weathercooking in Scotland, 17th c*



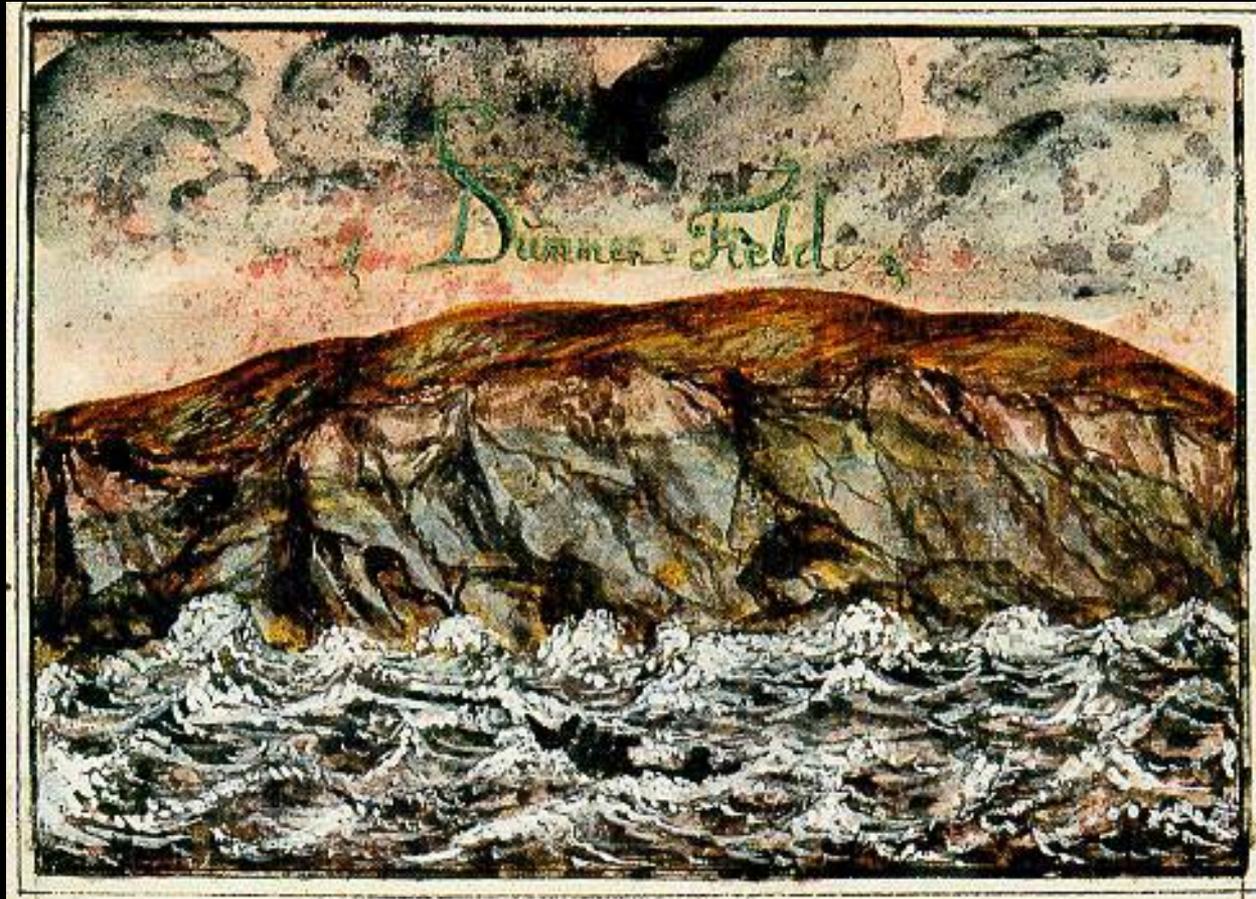
*Newes from Scotland (1591), concerning North Berwick witch hunts 1590-1*

## ***Finnmark (Norway) witch trials linked to storms***



A witch sinking ships with magic spells. Olaus Magnus, *Historia de gentibus septentrionalibus*, Rome 1555, University Library of Tromsø  
[www.ub.uit.no/northernlights/eng/myths04.htm](http://www.ub.uit.no/northernlights/eng/myths04.htm)

# *Hell is a cold place – Dømen, Norway*

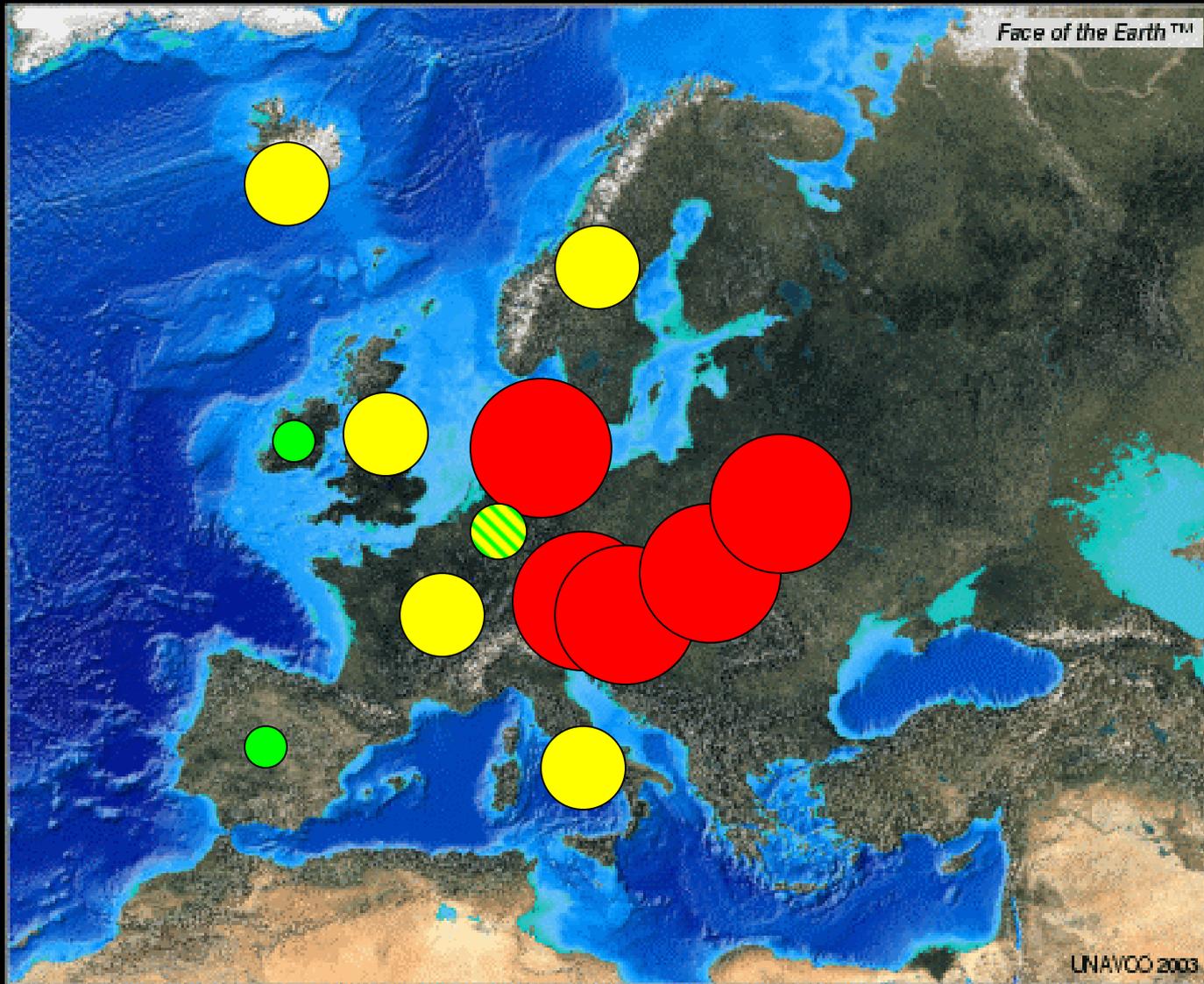


# ***Storm brewed by witches, Germany 1574***



Devil's Sabbath, book illustration in *Züricher Chronik* 1574 <http://www.zpr.uni-koeln.de/~nix/hexen/galerie/e-magie.htm>

# Per capita legal executions for witchcraft



Data: W. Behringer 2004

## *Little Ice Age: Mass witch burnings, Central Europe*

Period	Locale	Number executed
1580 - 1620	Pays de Vaud	1000
1580 - 1595	Lorraine	800
1581 - 1595	Treves	350
1626	Bamburg	600
	Würzburg	900
	Electorate Mainz	900
	Westphalia	2000

“Since everybody thought that the continuous crop failure was caused by witches from devilish hate, the whole country stood up for their eradication.”

Johann Linden, Treves, ca. 1590

Source: W. Behringer 1987, 1995

# Francisco de Goya y Lucientes (1746-1828)



*El sueño de la razón  
produce monstruos*