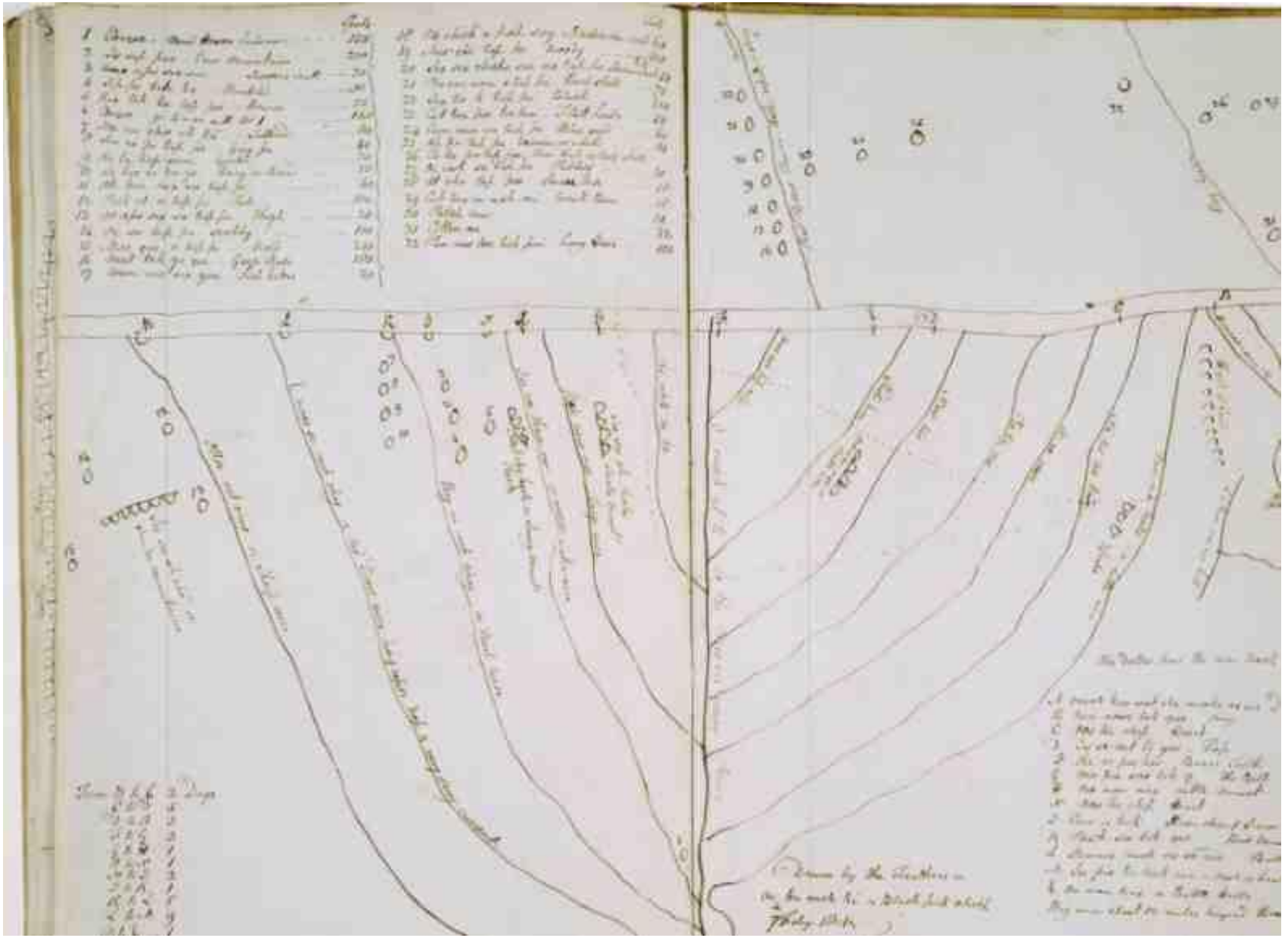
History of Cartography

World's oldest map ?
Babylonia, 6th century BC

https://www.geographyrealm.com/oldest-known-map-world/

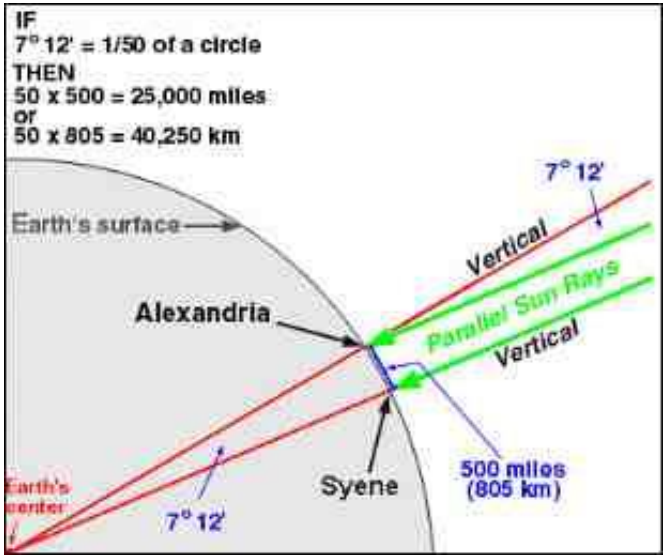
https://www.gislounge.com/mapping-through-the-ages/

In 1801, a Blackfoot named ‘**Ac ko mo ki’** drew a map in the snow or dirt for **Peter Fidler** of the Hudson's Bay Company.



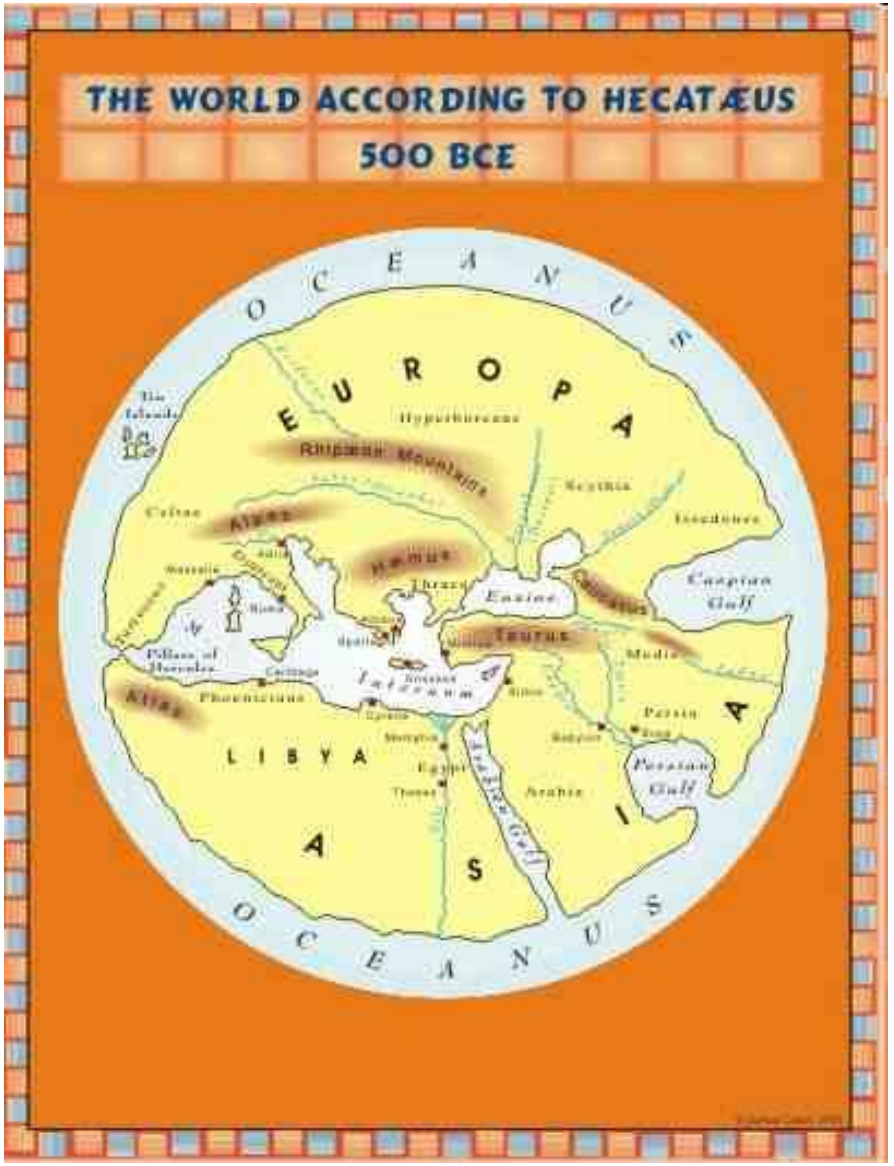
Ancient Greeks 500BC - 500AD

Eratosthenes (275-195BC)
- circumference of earth

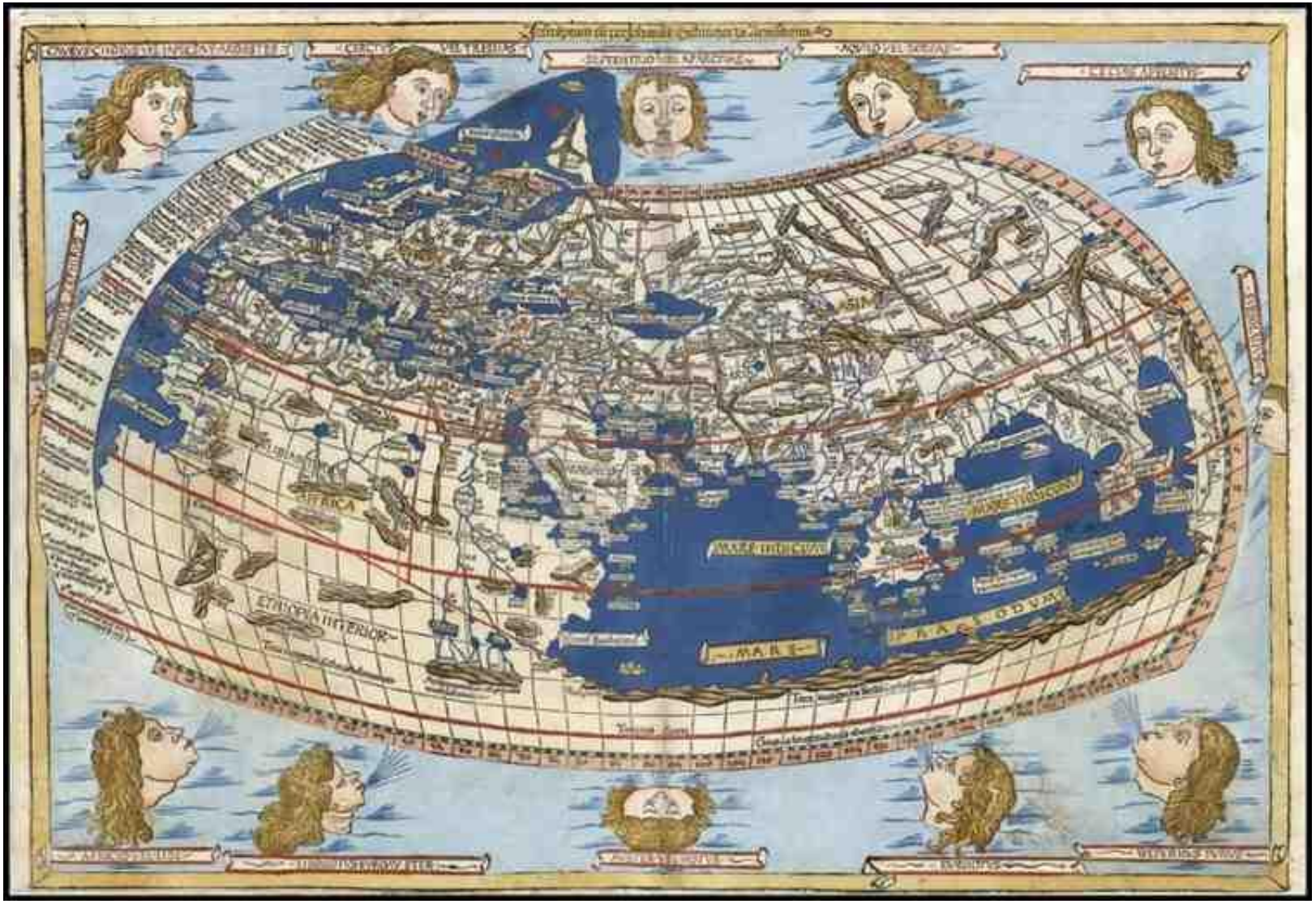


Hipparchus (190-120BC)
- latitude / longitude

First map projections
- azimuthal Thales, etc.)



Ancient Greeks Claudius Ptolemy, (AD 90-168)



Ptolemy compiled all known world locations

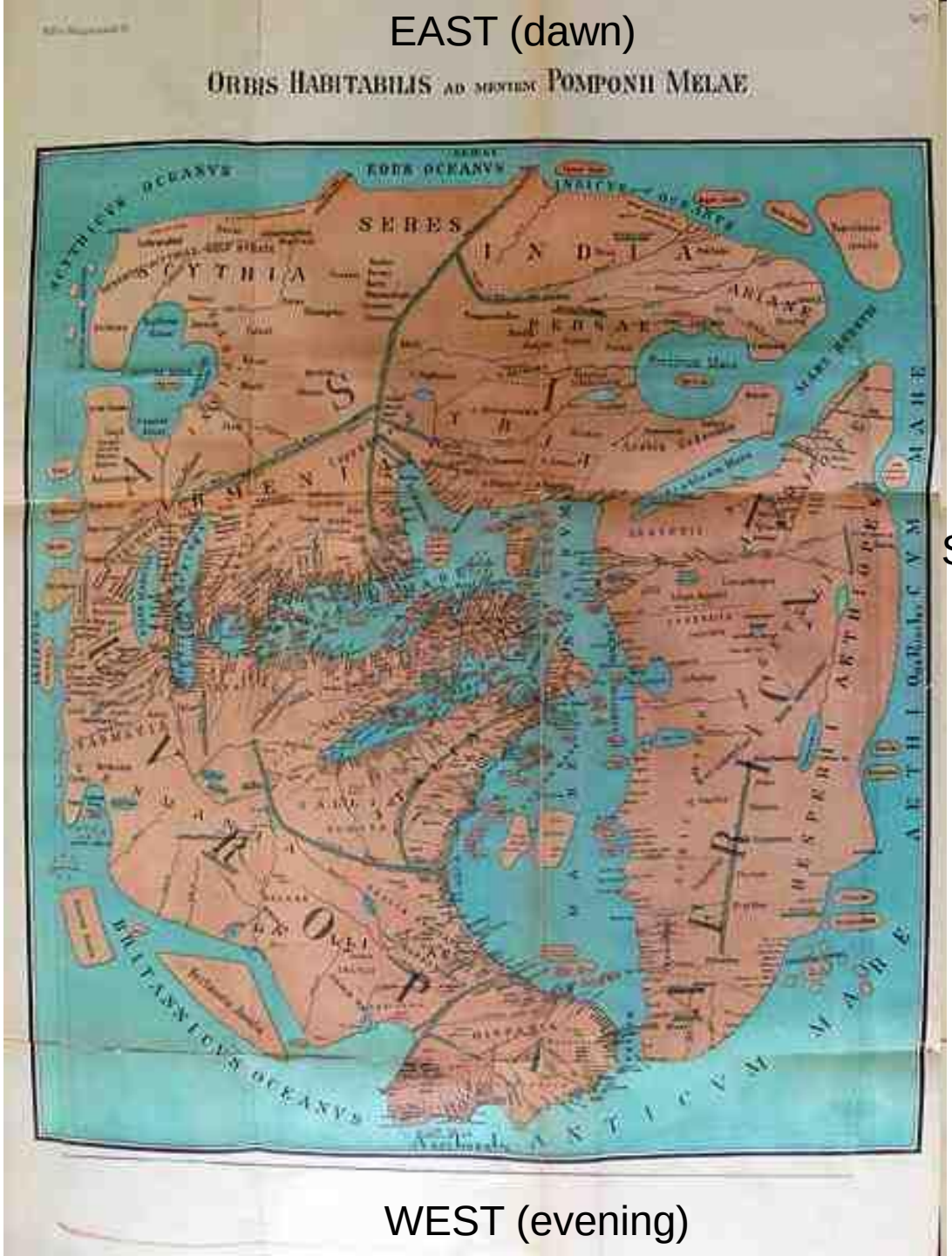
- Overestimation of longitude extent contributed to Columbus ‘bumping’ into America

Roman world map reconstruction

AD 43

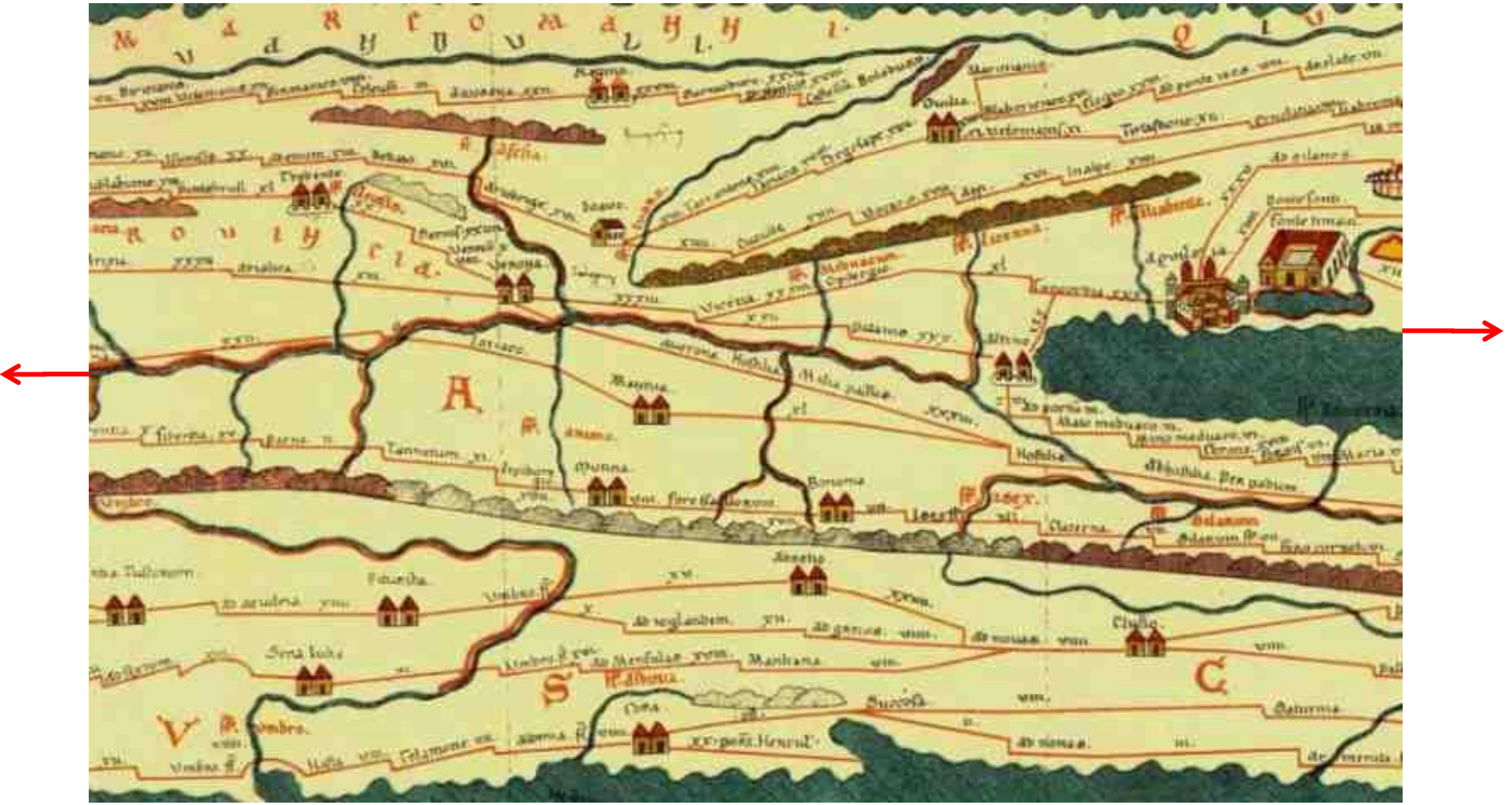
NORTH (Left)

East (Orient) to top



Romans: Tabula Peutingeriana (4th century)

The Tabula Peutingeriana (*Peutinger table*) shows the road network in the Roman Empire. It is a 13th-century copy of an original map dating from the 4th century, covering Europe, parts of Asia (India) and North-Africa.



Early car navigation device, like the Peutinger table:

Pre-GPS GPS 1910s

The Medieval Dark Ages: "T-in-O" maps

T is the Mediterranean and Nile/Don Rivers O is the extent of the known world:

One continent for each of Noah's sons

Hereford Mappa Mundi ~1300

'T in O' map

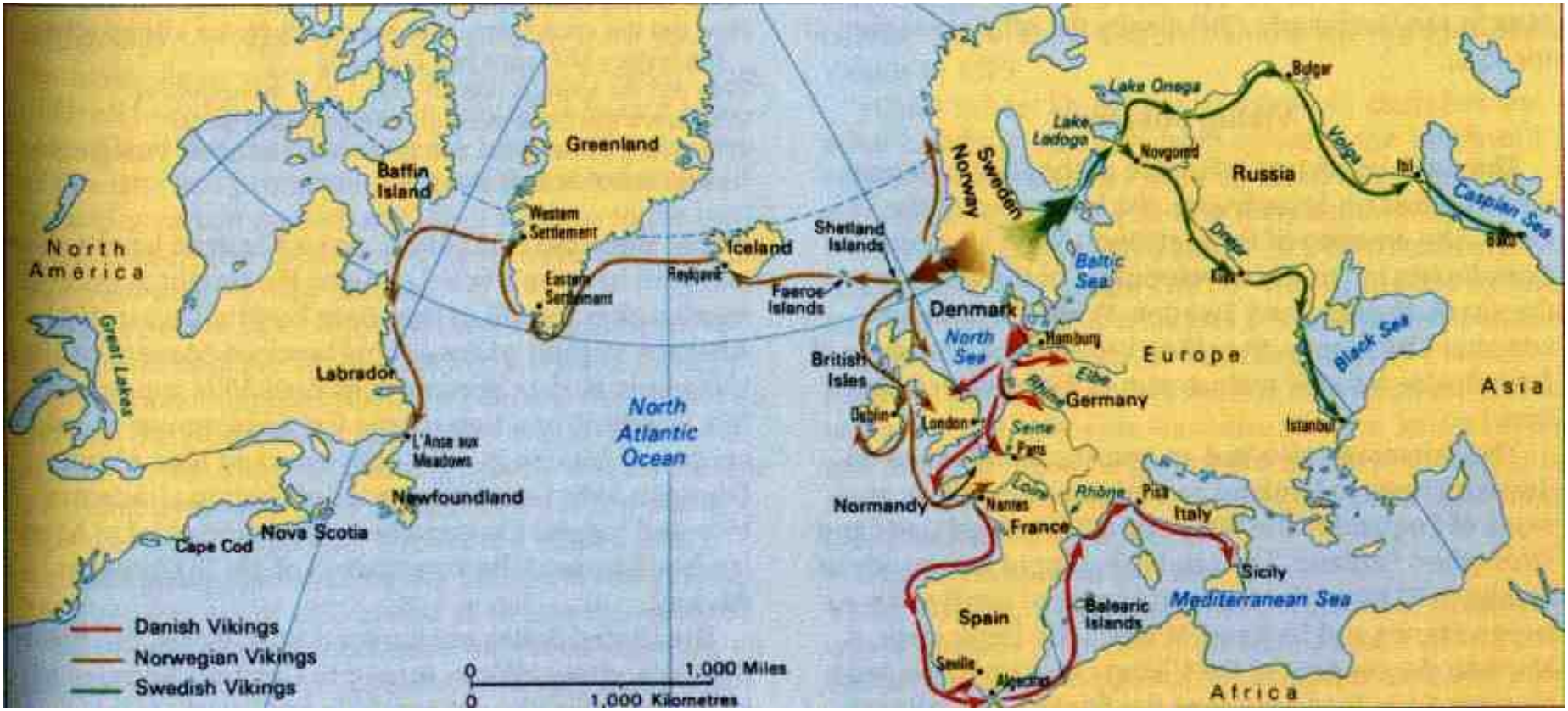
Viking voyages of 'exploration' : 793-1066AD

Faroes 825 (510: St. Brendan)

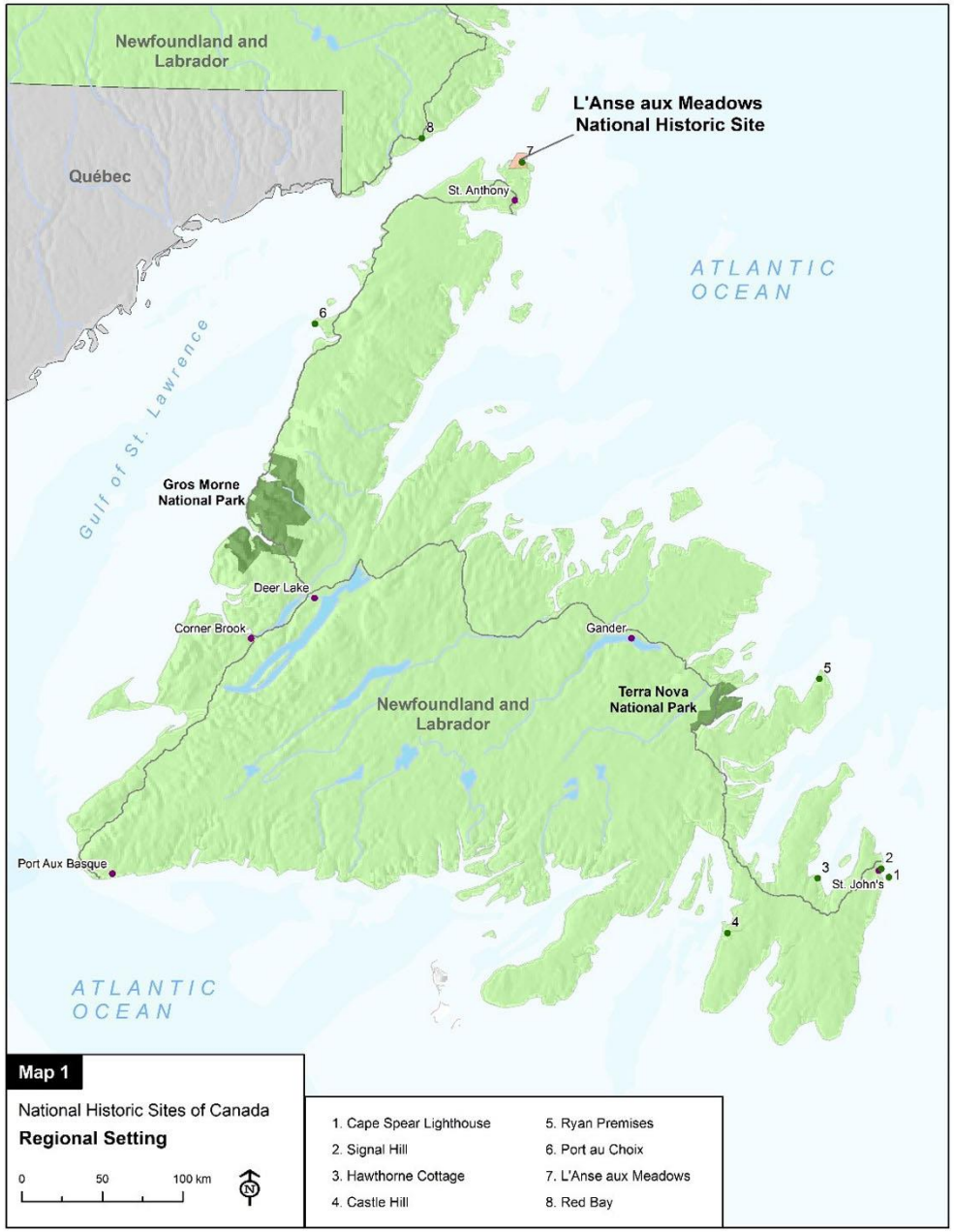
Iceland 874 (Irish monks earlier)

Greenland 980

Newfoundland 986 (proven in the 1960s)

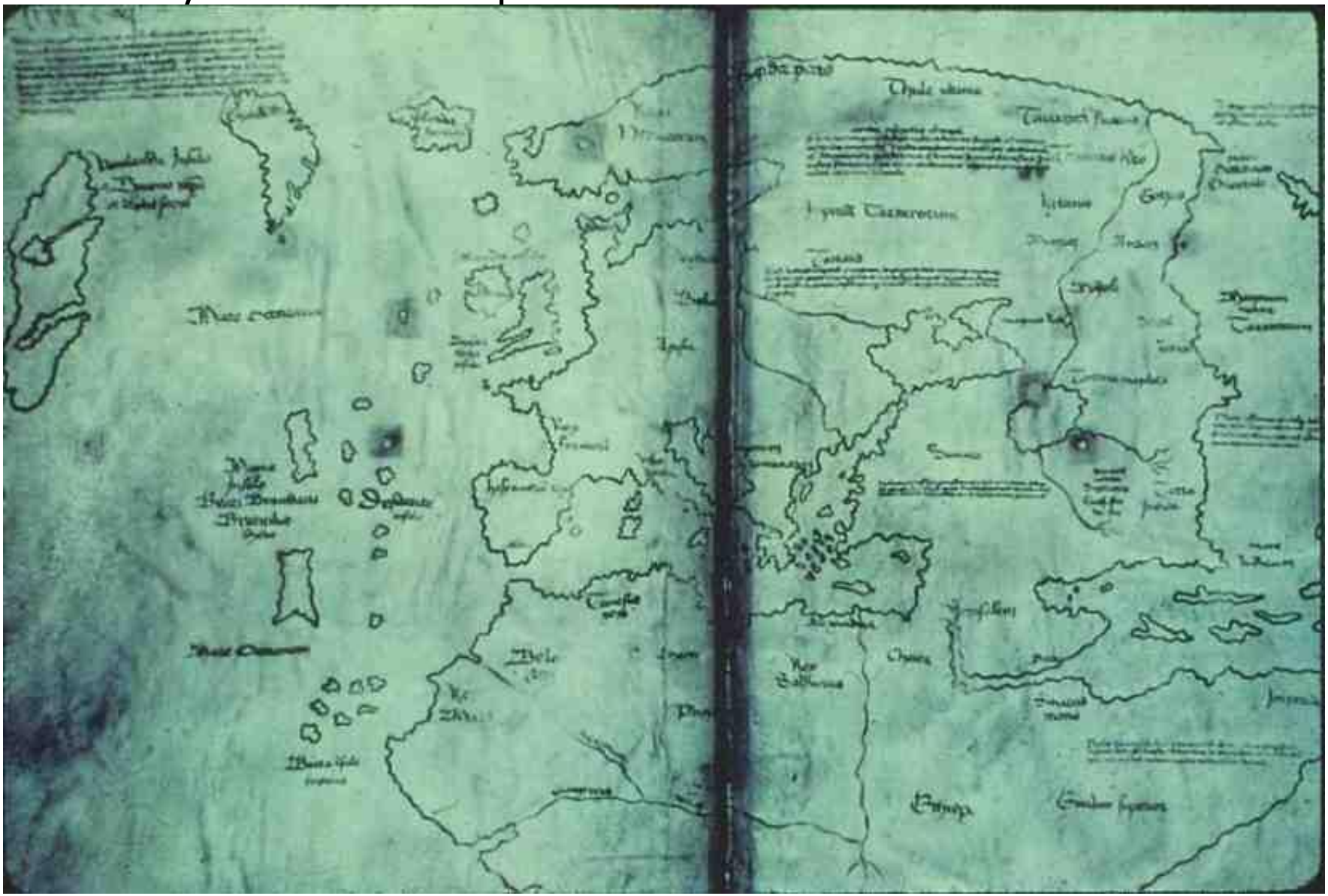


L'Anse aux meadows, NL
Leif Erikson ~ 995 (1000) AD



Vinland map: Discovered 1957, dated to ~1440

contained 1920s inks and radioactive elements from 1950s showed it to be a likely fake – did Europeans know about America before 1492 ?




COLUMBUS HAD A
NORWEGIAN MAP

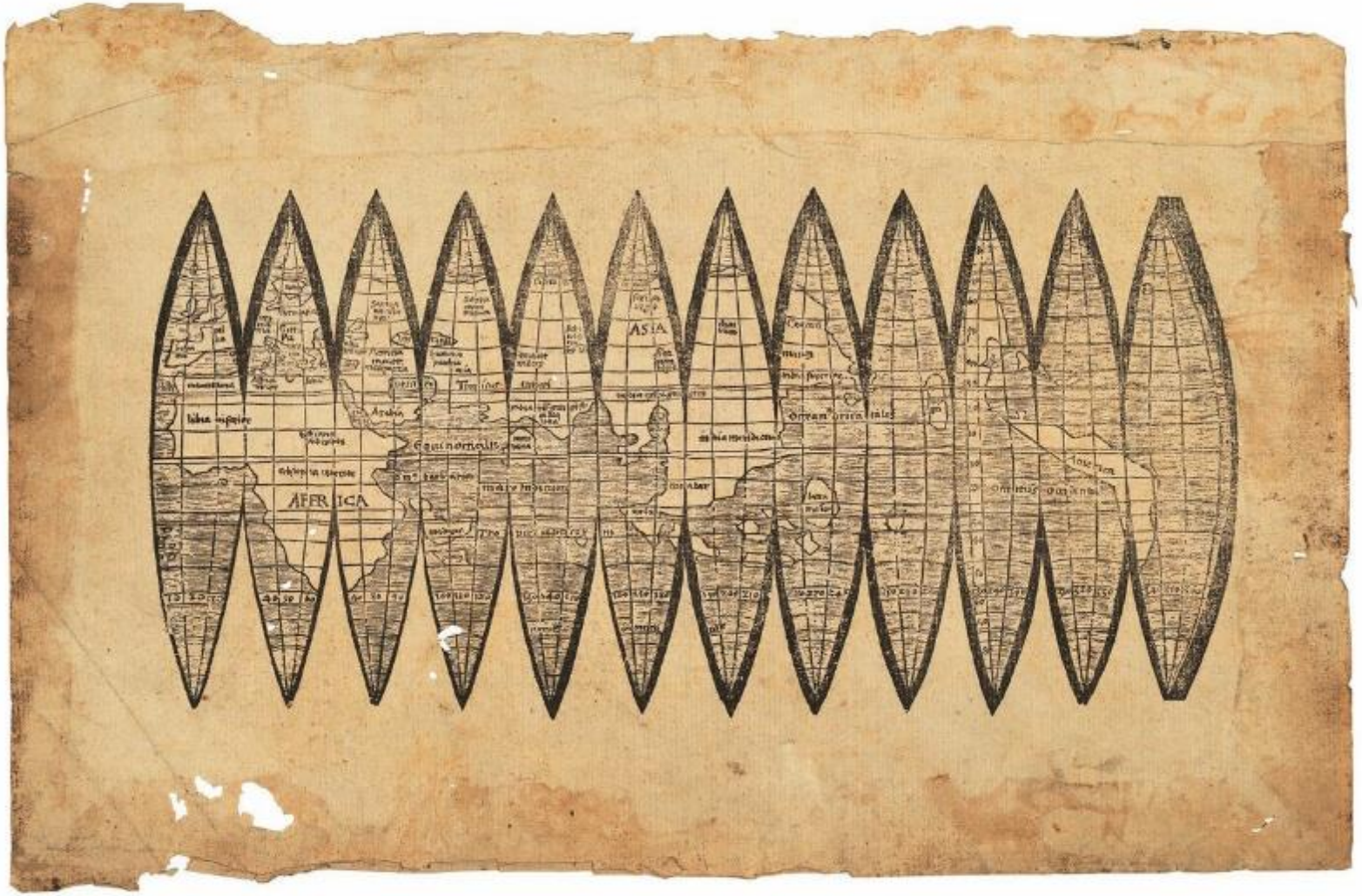
Chinese map, 1763 copied from 1418 ?

Arabic cartography: Al-Idrisi 12th century

The *Tabula Rogeriana*, by Muhammad al-Idrisi for Roger II of Sicily 1154.

The Renaissance (~1400): Ptolemy's world is 'rediscovered'

First European map showing America, 1507
from voyages of discovery: Martin Waldseemüller,



Voyages of discovery, rediscovering the Greek cartography …..
But the biggest change in the renaissance and the 2nd millenium was:

Invention of the printing press by Gutenberg, 1440

(though movable type was developed in China in 1041 by Bi Sheng)

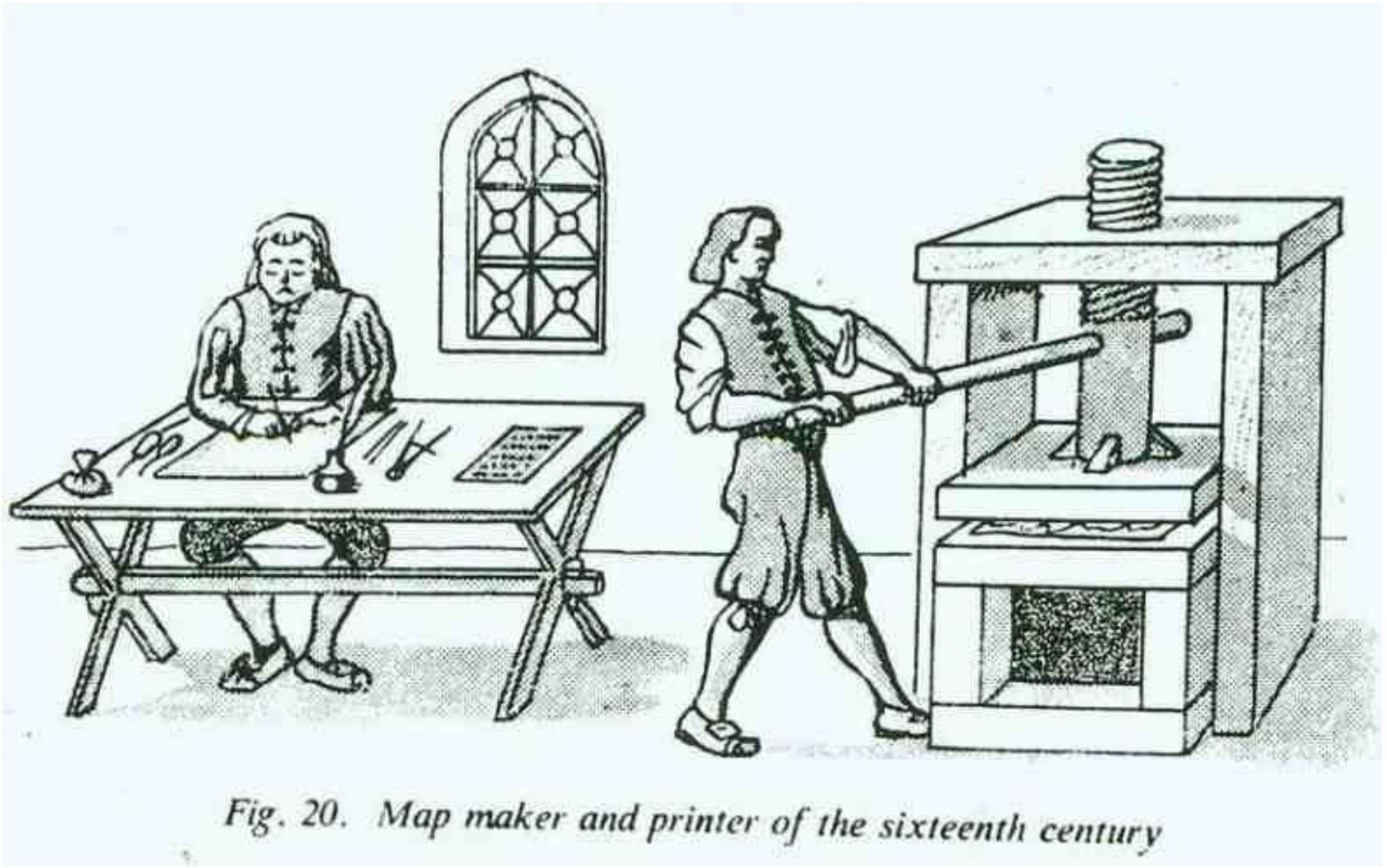
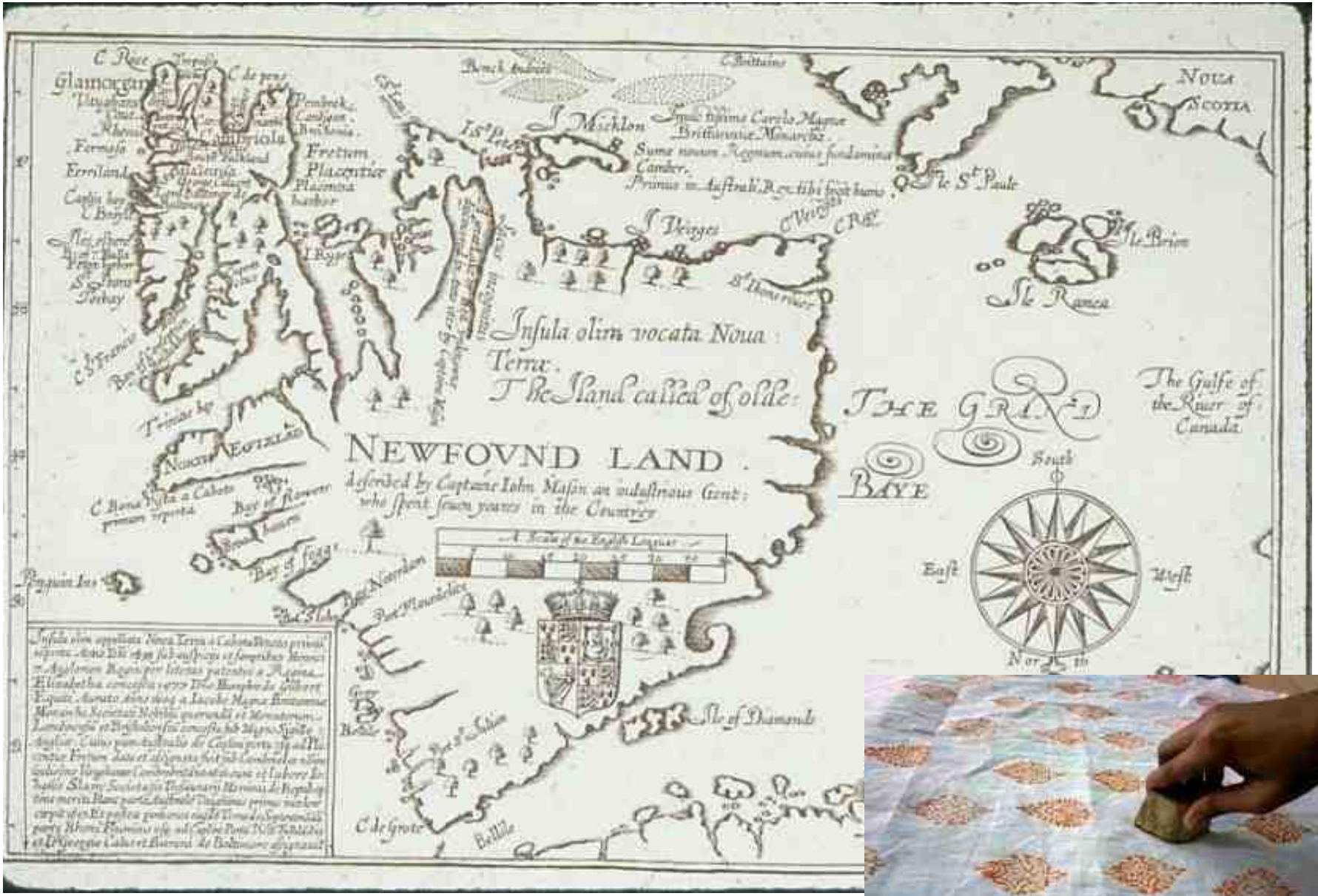


Fig. 20. Map maker and printer of the sixteenth century

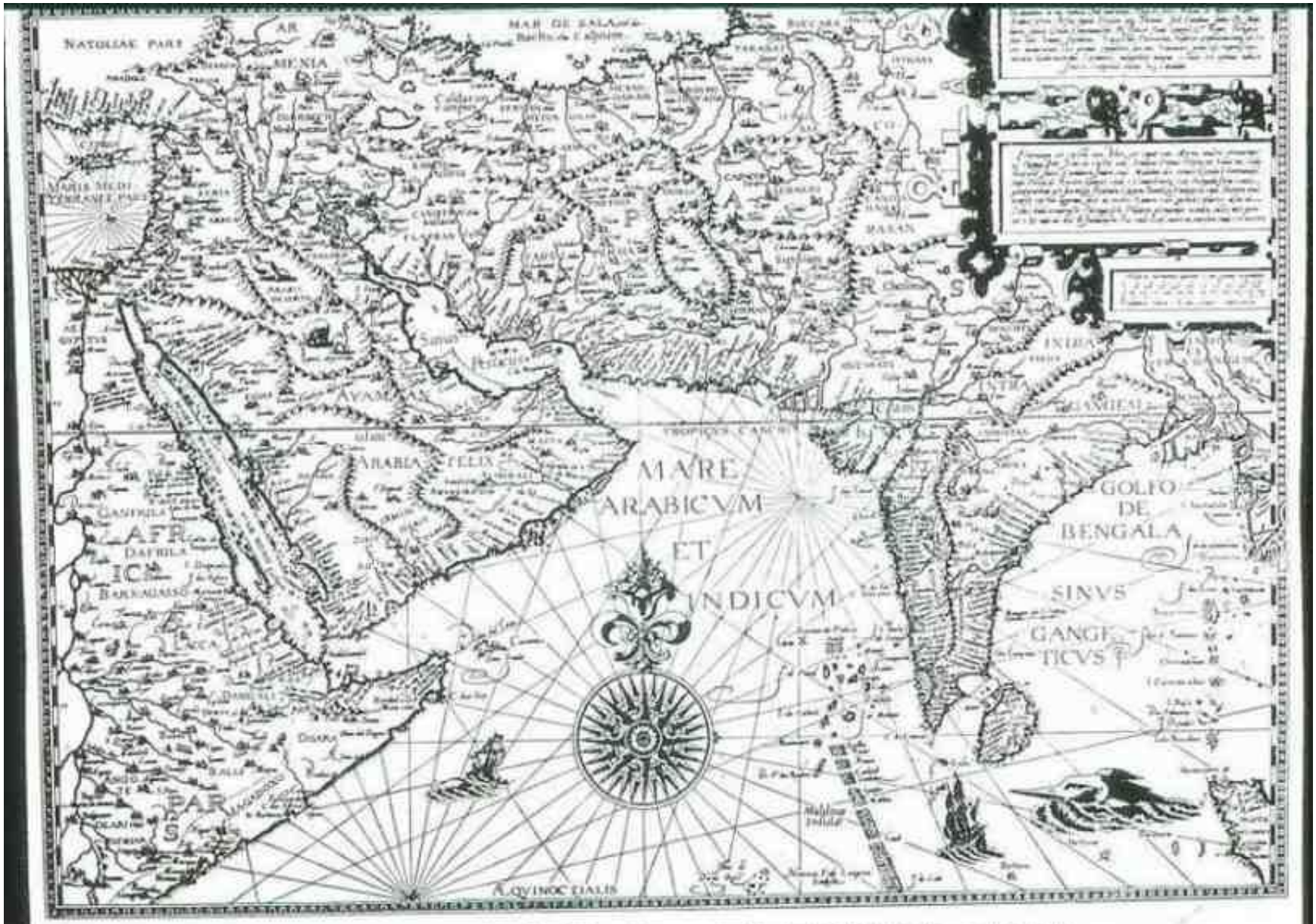
Maps (and books) could now be printed in quantity

Printing technology: 16th century woodcut



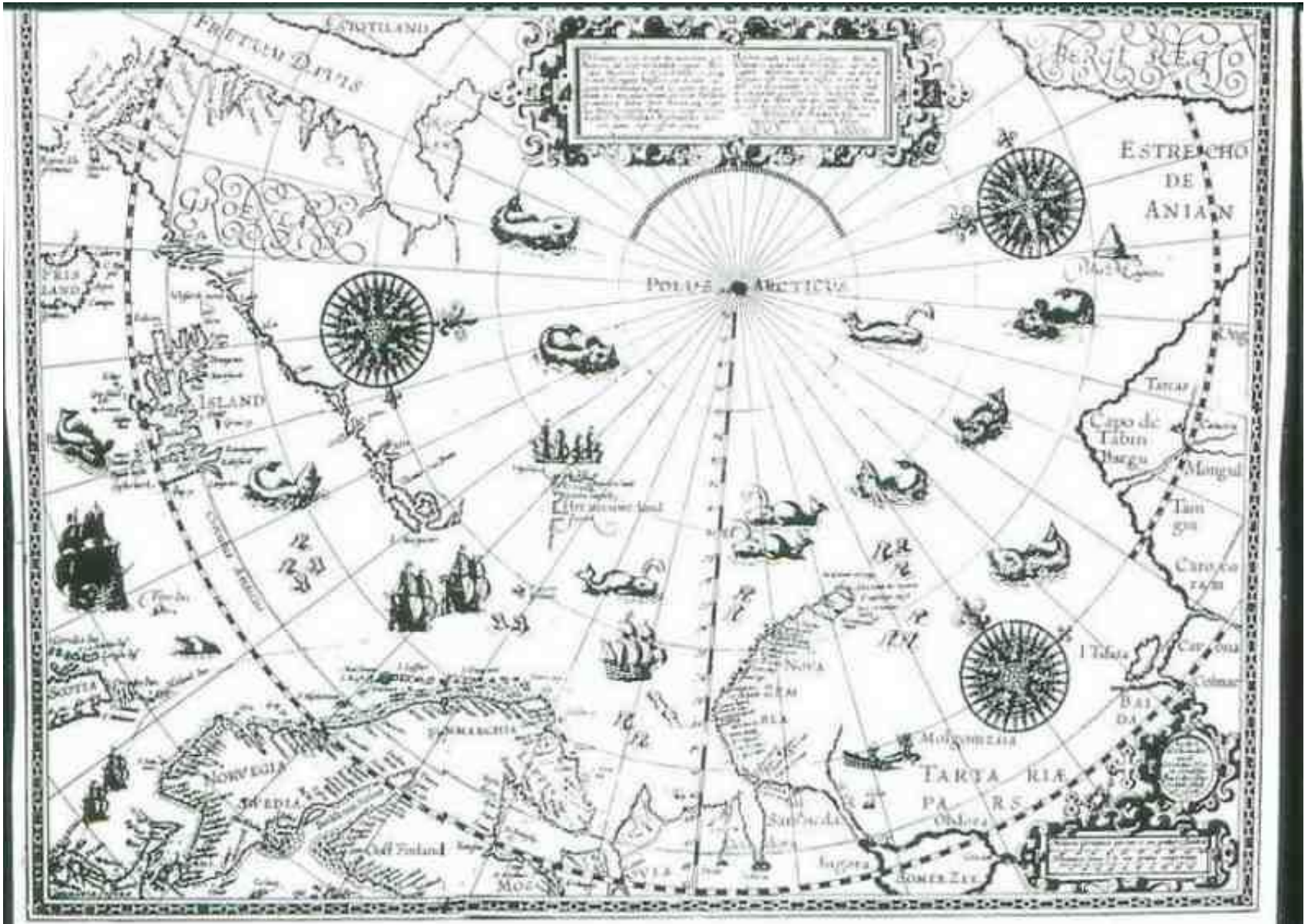
Wrong-reading plate – mirror image

Copper engraving ('intaglio') 1596



The Indian Ocean, engraved by Hendrik van Langeren. In Linschoten's *Itinerario* (Amsterdam, 1596)

16th century map showing 'cartouches' and beasties



The Arctic Regions, by Willem Barents, engraved by Baptista van Doetecum, 1598.
In Linschoten's *Navigatio ac itinerarium* (The Hague, 1599)


Nördlicher Polar-Kreis.
ISA FIORD
VESTLAND
BREIDE
FIORD
DALE
SYSSEL
SNAEFIELLS SYSSEL
HNAPPADALS SYSSEL
MYRE
FAXE
FIORD
BORGARFIORD SYSSEL
SUDLAND
RANGAA
VALLE
SYSSEL
GULDBRINGE SYSSEL
C. Reikianes
HUNAVATNS
HEGRANES
NORDLAND
SYSSEL
THINGOE
SYSSEL
MULE
SYSSELS
OSTLAND
SKAPTAA
FIELLS
SYSSEL
Hekla
Markar-fliot
Vester Horn
Charte
von
ISLAND
Weimar

The development of the sciences 1700->

- Division into topographic and thematic mapping

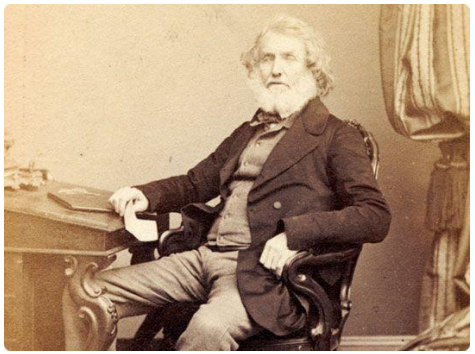
Data collection e.g. census

- Development of surveying

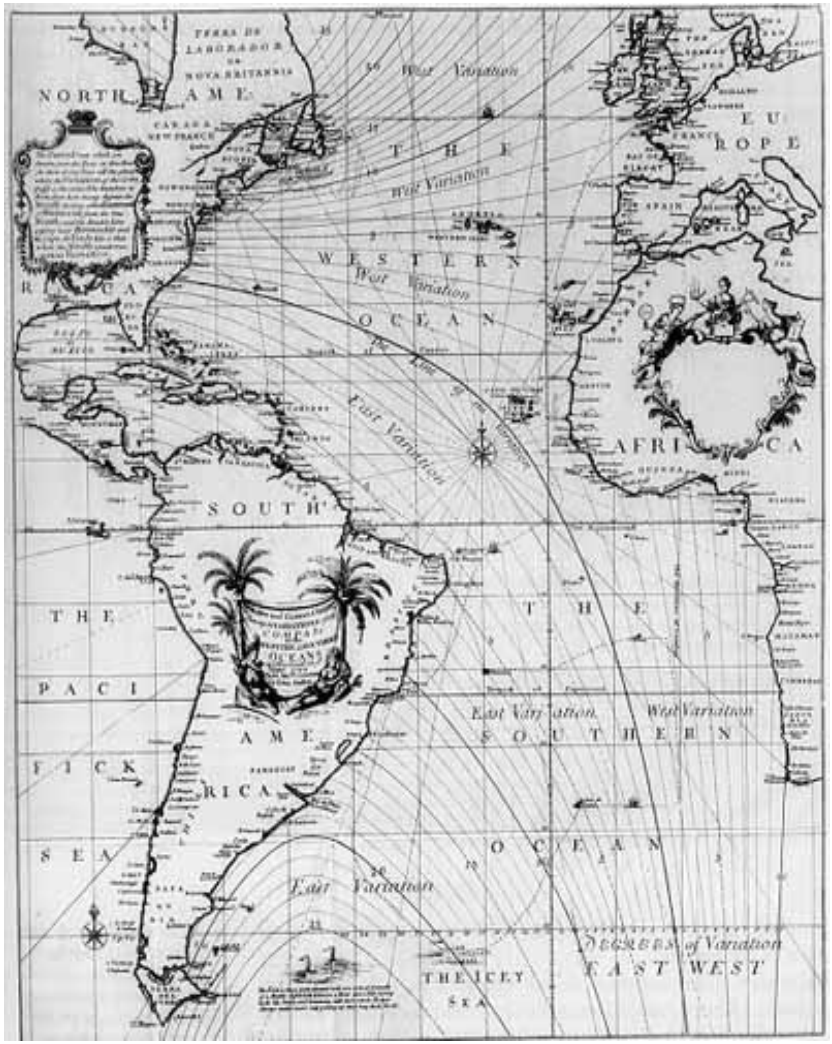
- Geodesy: first calculation of earth's ellipsoid 1817

- few elevations pre-1800s

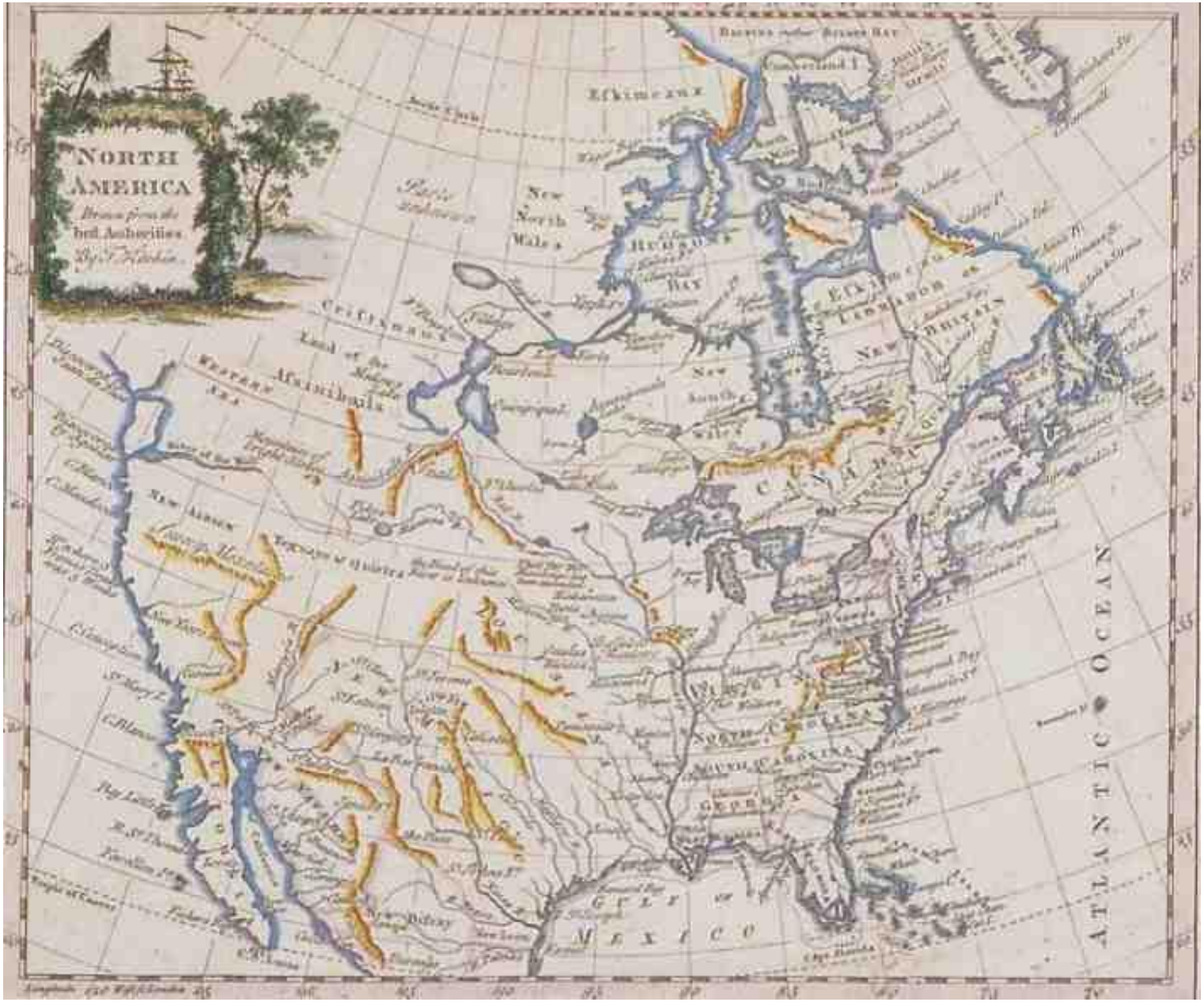
- George Everest Ellipsoid 1830



Halley's 'isogonic' map – lines of equal compass Declination (from true north)



Early 18th century colour map (hand coloured)



Latitude was easy to measure but Longitude ??

Sir Cloudsley Shovell and grave Scilly Isles, 1707

Longitude 1759

John Harrison's chronometer

Accurately measured time to compare with local time and how far east/west compared to starting point

Time zones – Sandford Fleming (Canada)

1 hour = 15° longitude

Lithographic (stone) printing plate (1796)

Based on water and oil not mixing –Alois Senefelder

Plate is created 'wrong-reading'
= mirror image
'Transfer lithography' came later

Printing methods

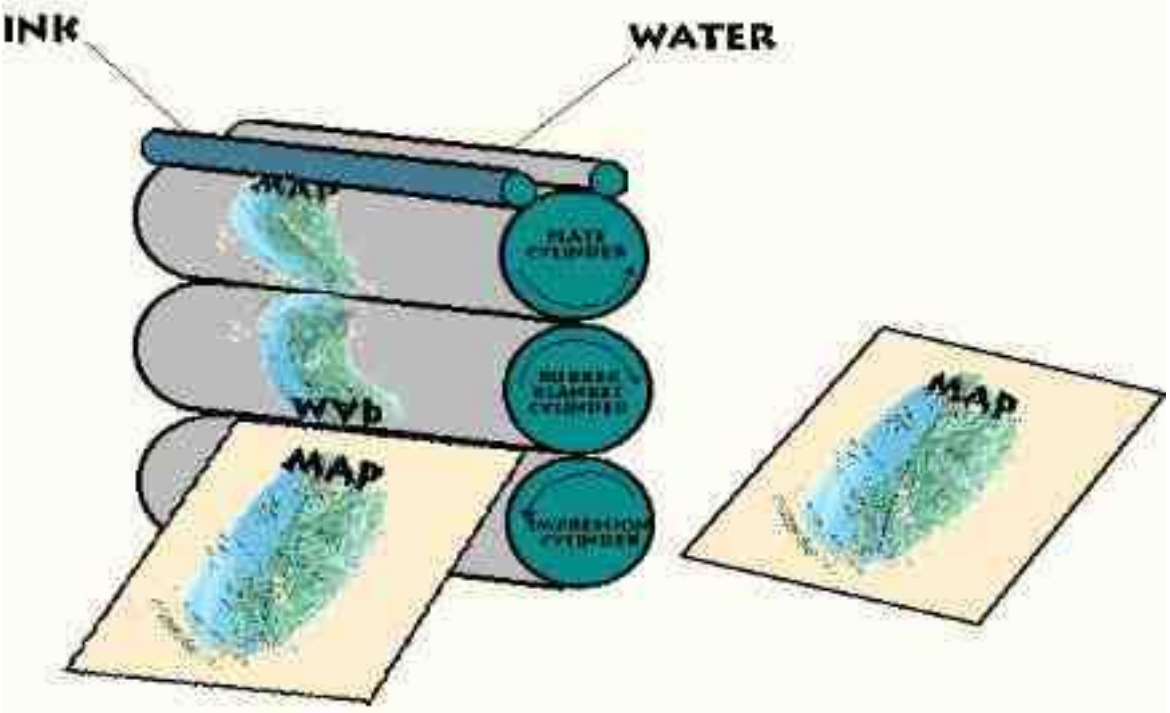
- Woodcut: image area is raised and holds ink
- Intaglio engraving: incised cuts hold ink
- Lithography: surface texture (grease) holds ink

These methods could NOT show continuous shading or colour registration (for layers), and mirror image

Photo-lithography & offset printing (1875)

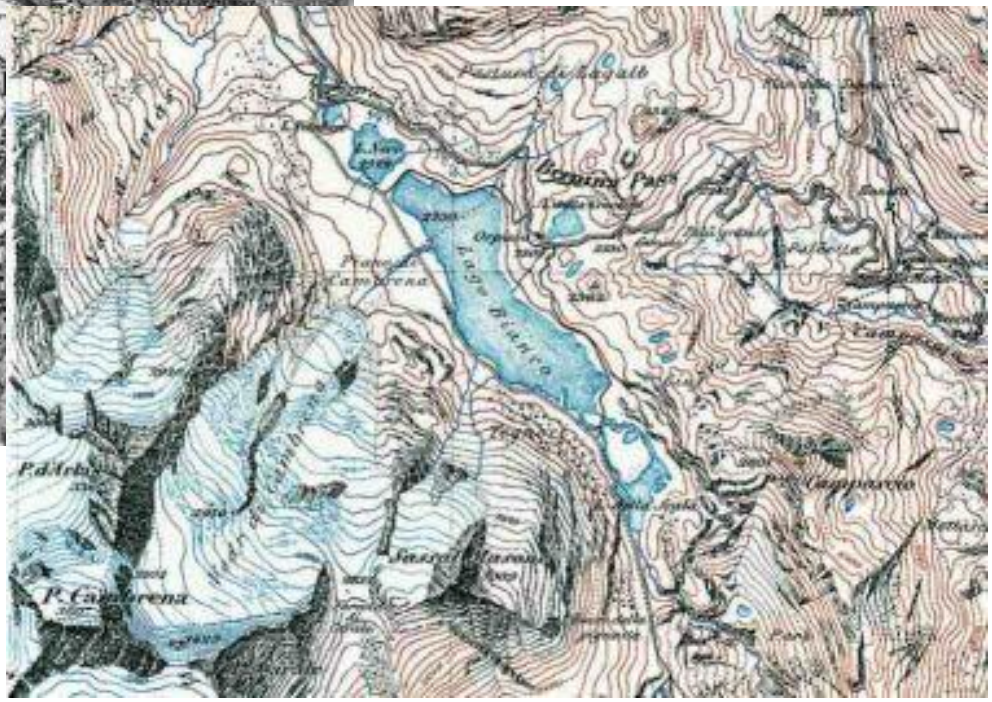
With photo-lithography, full colour map prints were possible.
Thin copper plates are produced from photo negatives.
Plates wrap around drums, therefore printing was continuous.
An intermediate drum added … to avoid a wrong reading plate.

Offset Cylinder



Impact of offset printing and improved survey technology

Dufour hachures Switzerland, 1845-65



Bernina Pass, Switzerland 1877

During the 20th century, maps became more abundant due to improvements in printing and photography that made production cheaper and easier.

1950 ->

20th century Technology

Aerial photography

Photogrammetry

Post- war (1945) Mapping of Canada

Postwar (1950) society changes affecting mapping

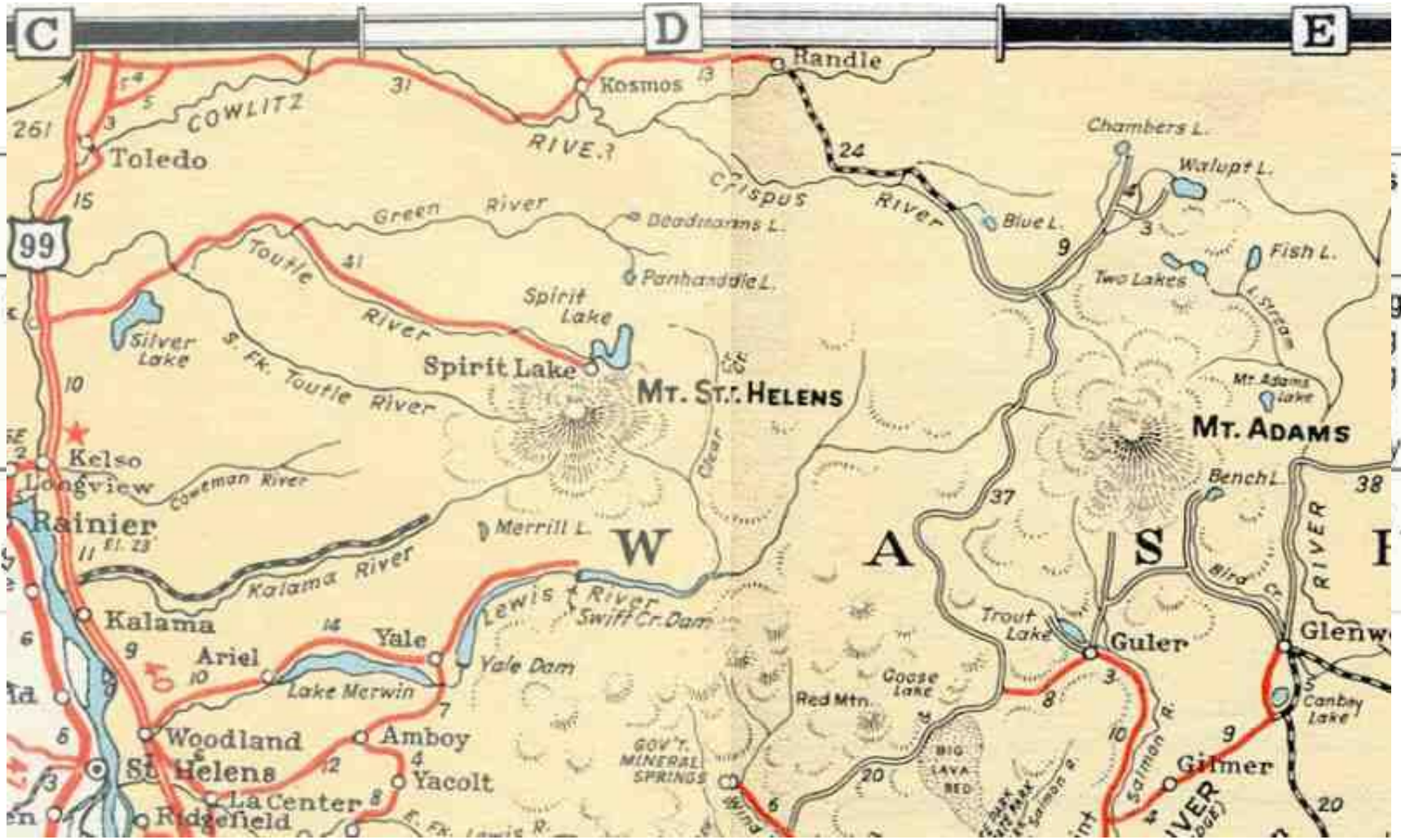
- Increased leisure time and travel – road maps, park maps

- Addition of hillshading (still costly before computers)

- Increased attention to non-scientific users

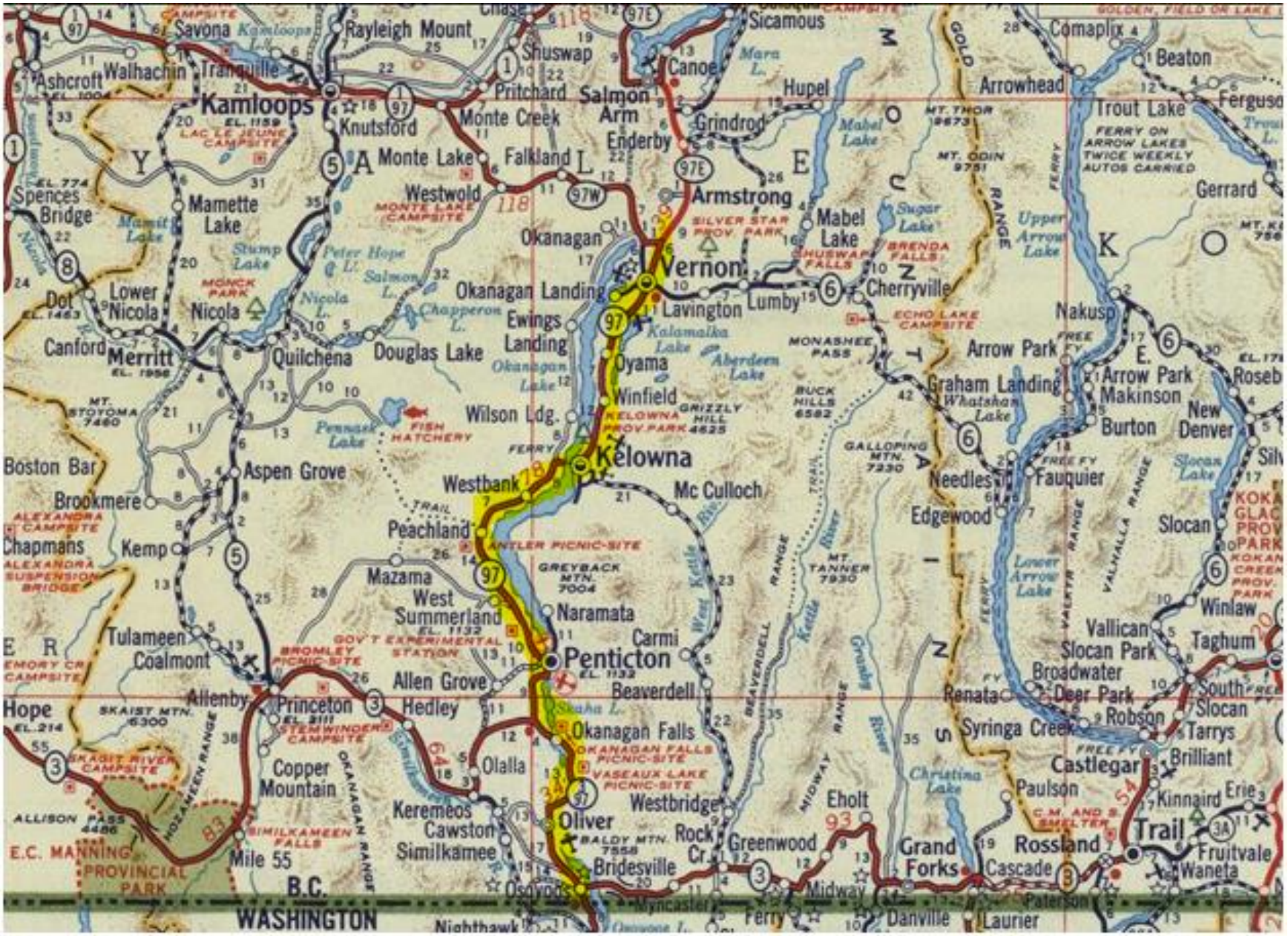
- Maps for new groups, e.g. visually impaired

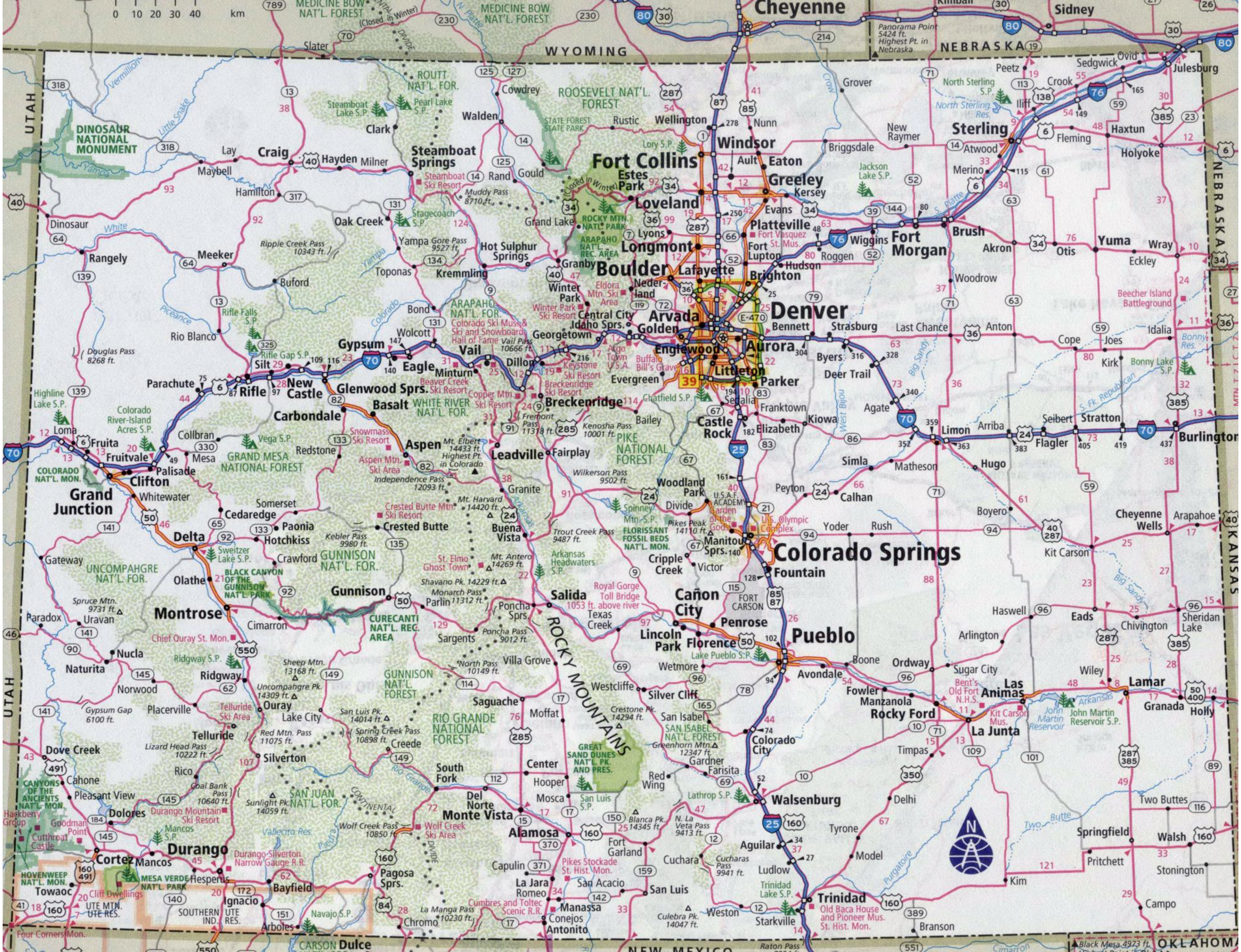
Society changes after ~1950 – road maps



http://roadsandmaps.zxq.net/images/1959OregonOfficial/oregon-west.png

BC 1966 road map



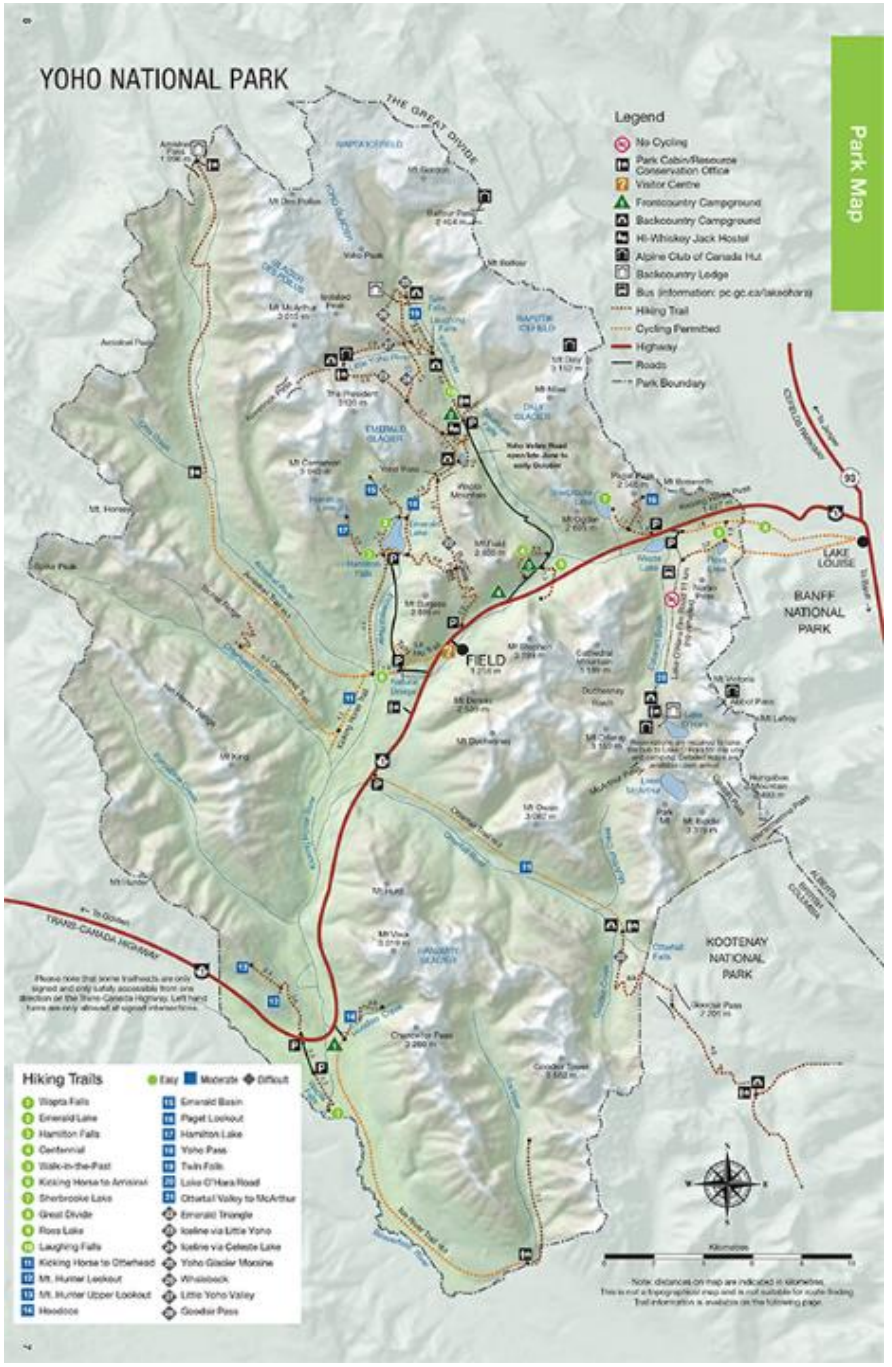


WYOMING
NEBRASKA
KANSAS
OKLAHOMA
NEW MEXICO
UTAH
Cheyenne
Sidney
Kimball
Julesburg
Sterling
Fort Collins
Windsor
Greeley
Loveland
Estes Park
Longmont
Boulder
Lafayette
Brighton
Denver
Arvada
Golden
Aurora
Englewood
Littleton
Parker
Castle Rock
Fort Morgan
Brush
Yuma
Wray
Burlington
Limon
Colorado Springs
Fountain
Pueblo
Cañon City
Florence
Penrose
Lamar
Las Animas
La Junta
Rocky Ford
Trinidad
Walsenburg
Alamosa
Monte Vista
Del Norte
Durango
Cortez
Mancos
Montrose
Delta
Grand Junction
Fruita
Clifton
Palisade
Glenwood Sprs.
Rifle
New Castle
Silt
Parachute
Carbondale
Basalt
Aspen
Vail
Eagle
Gypsum
Leadville
Breckenridge
Dillon
Georgetown
Idaho Sprs.
Central City
Evergreen
Steamboat Springs
Craig
Hayden
Meeker
Rangely
Walden
Granby
Kremmling
Hot Sulphur Springs
Gunnison
Crested Butte
Salida
Buena Vista
Ouray
Telluride
Silverton
Pagosa Sprs.
Springfield
Walsh
Holly
Eads
Cheyenne Wells
Kit Carson
Hugo
Simla
Woodland Park
Manitou Sprs.
Cripple Creek
Victor
Colorado City
Aguilar
Westcliffe
Silver Cliff
Saguache
Center
Lake City
Creede
Nucla
Naturita
Norwood
Dove Creek
Dolores
Bayfield
Ignacio
ROCKY MOUNTAINS
DINOSAUR NATIONAL MONUMENT
ROOSEVELT NAT'L. FOREST
PIKE NATIONAL FOREST
WHITE RIVER NAT'L. FOR.
GRAND MESA NATIONAL FOREST
UNCOMPAHGRE NAT'L. FOR.
GUNNISON NAT'L. FOREST
RIO GRANDE NATIONAL FOREST
SAN JUAN NAT'L. FOR.
SAN ISABEL NAT'L. FOREST
ROUTT NAT'L. FOR.
MEDICINE BOW NAT'L. FOREST
ARAPAHO NAT'L. FOR.
GREAT SAND DUNES NAT'L. PK. AND PRES.
MESA VERDE NAT'L. PARK
ROCKY MTN. NAT'L. PARK
BLACK CANYON OF THE GUNNISON NAT'L. PARK
CURECANTI NAT'L. REC. AREA
COLORADO NAT'L. MON.
FLORISSANT FOSSIL BEDS NAT'L. MON.
0 10 20 30 40 km

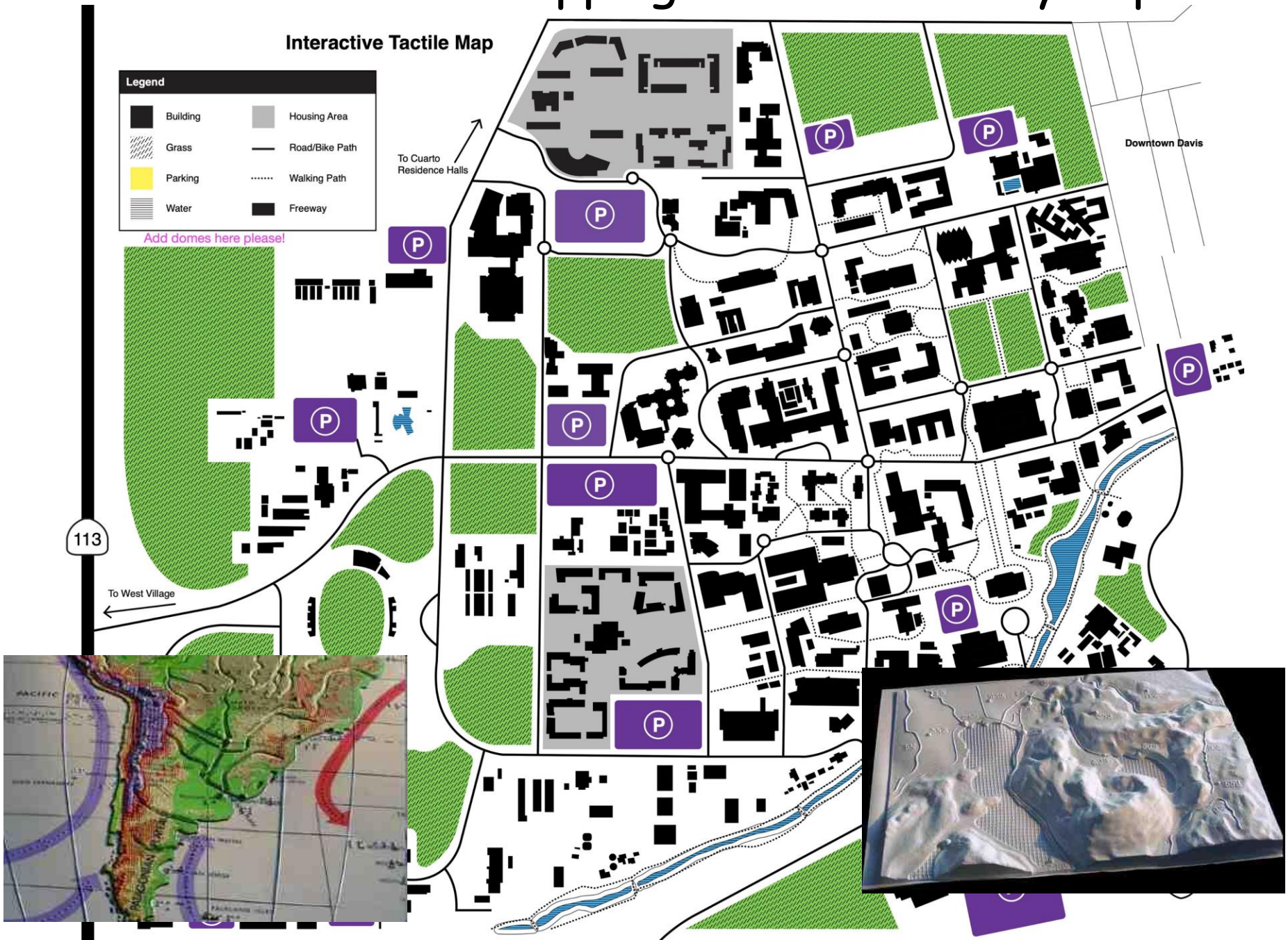
Parks / recreation maps

~1970s -> more addition of Shaded relief

Road travel maps



Post 1950: Tactile mapping for the visually impaired



http://www.davidrumsey.com

Next - History of mapping II: digital developments