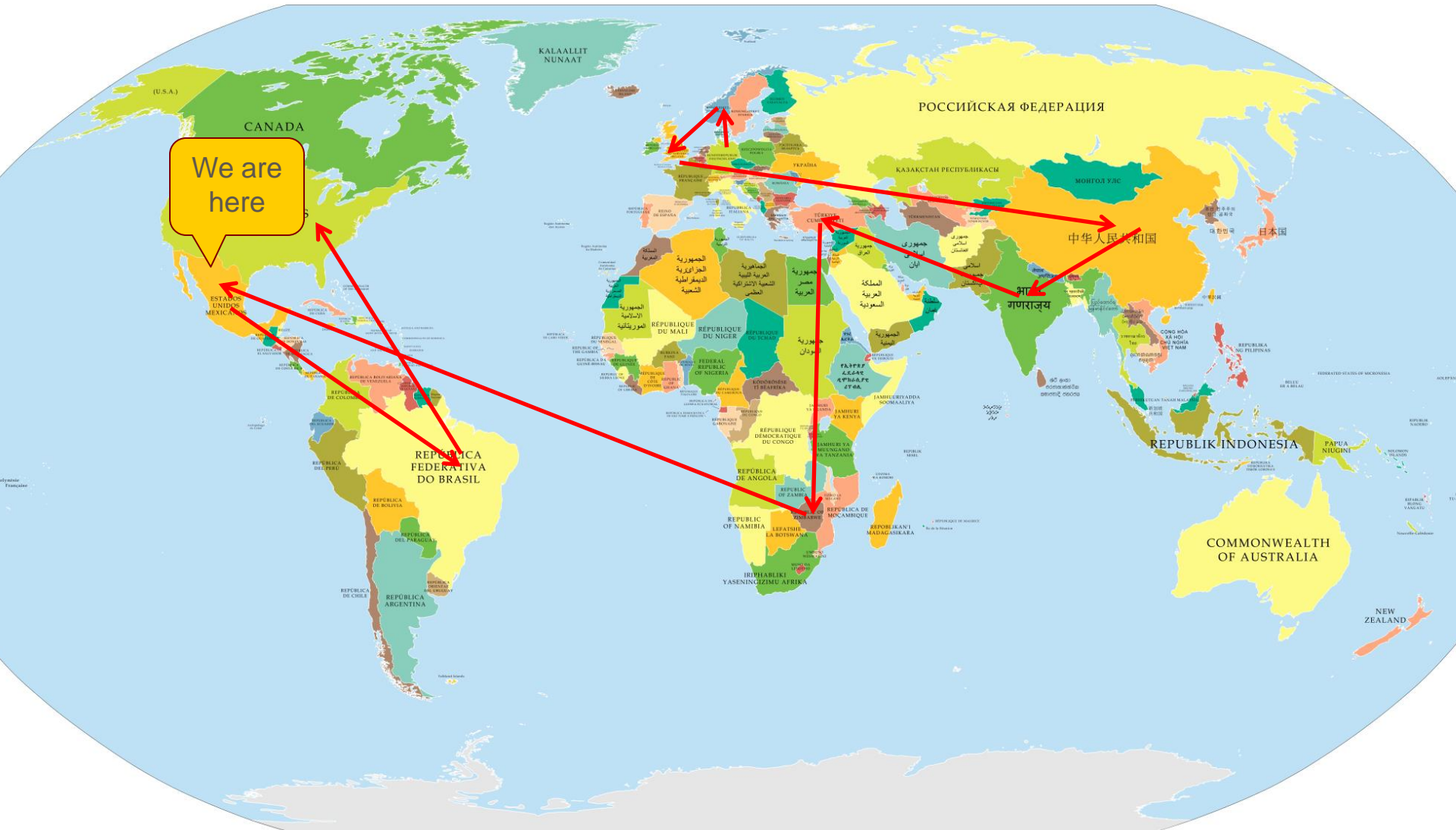


Mexico



Osher course, February 2024
J. N. Hooker

Travel Plan



Map of Mexico



Map of Mexico



Photo Album

México
D.F.

Metro area
population
22 million



Photo Album



La Catedral Metropolitana, El Zócalo, México D.F.

Photo Album

Oaxaca



Photo Album

Zacatecas

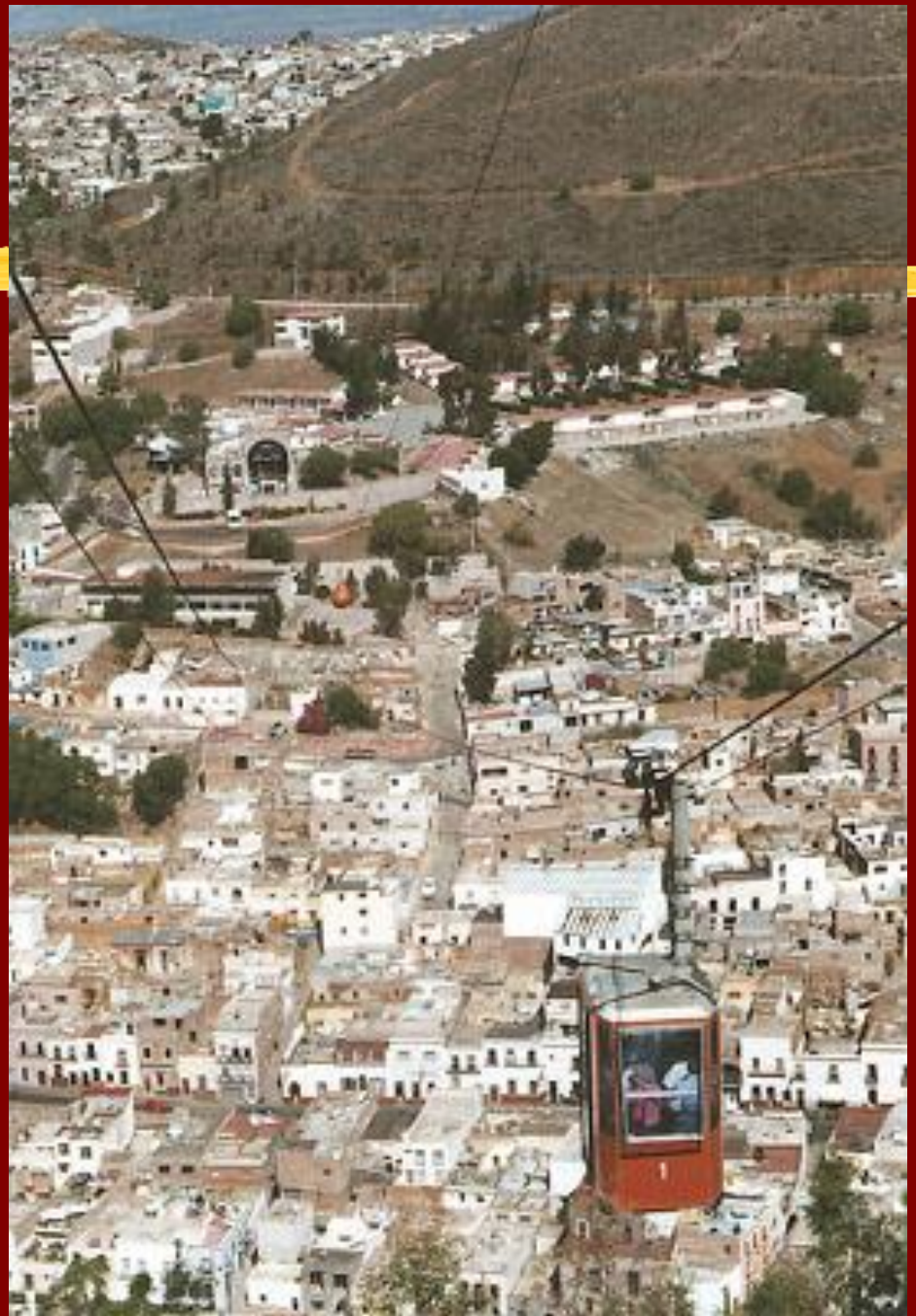


Photo Album

Maya pyramid at
Chichen Itzá



Photo Album

Teotihuacán



Aztec Religion

*Teca papaqui; teca
huehuetzcatica,
tetennecuilhuitica in
tlalticpac, amo
tle nelli;
auh amo nelli in quitoa,
in quitenehua: zan
tetennecuilhuitica.*

↑
Nahuatl
language

They mock the people on earth. They are happy at the mishaps of men; they make fun of the people on earth. Nothing is true. Nothing they express, nothing they say, nothing they reveal to the people is true: they are only deceiving the people.

Uncertainty avoiding culture

Photo Album

- Large Nahuatl, Maya, and Zapotec-speaking populations
 - Descendants of Aztecs, Maya, and Zapoteca
 - Words from Nahuatl: avocado, chili, chocolate, coyote, guacamole, tamale, tomato



Nahuatl-speaking man
from Cuetzalan, near
Puebla

Photo Album

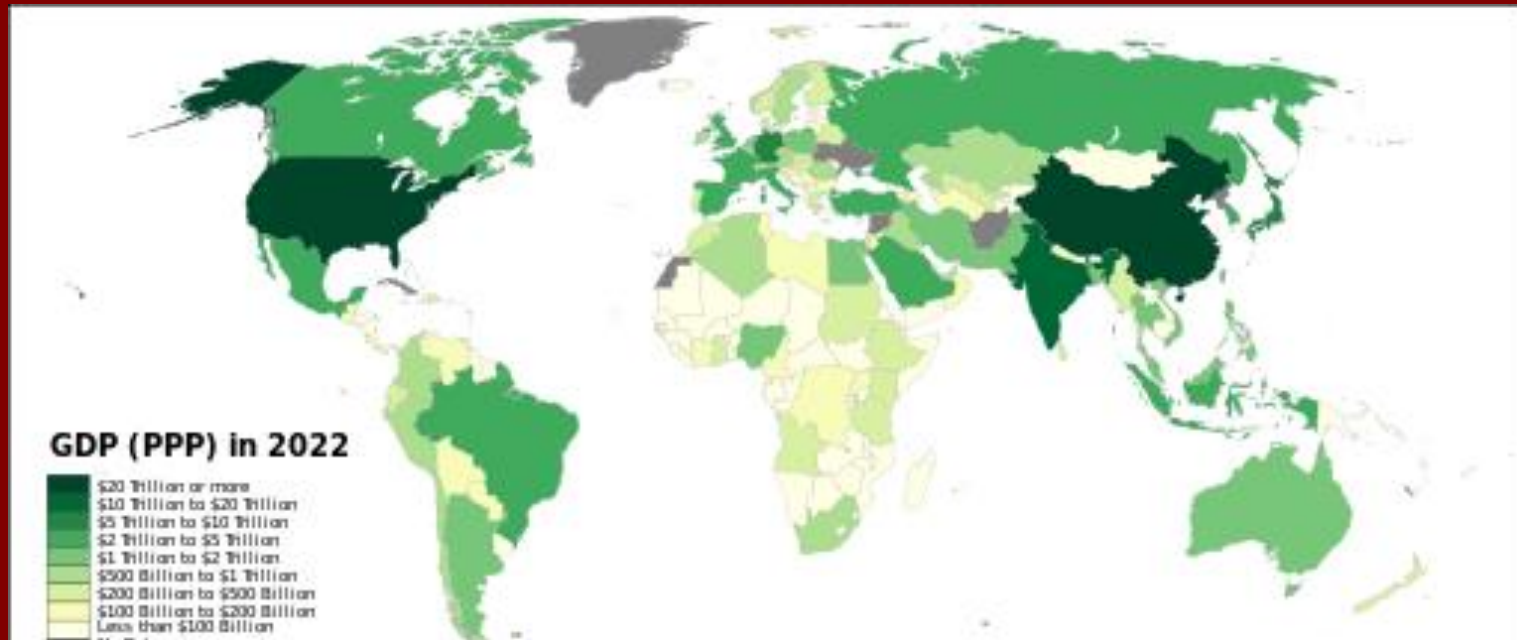
Dia de los
Muertos

Oct 31-Nov 2



Economy

- World's 12th largest economy (in PPP).
 - Larger than Canada's.
 - 2nd largest in Latin America, after Brazil.



Economy

- World's 11th largest economy (in PPP).
 - Larger than Canada's.
 - 2nd largest in Latin America, after Brazil.
 - Carlos Slim was richest man in the world 2010-2013
 - Head of Grupo Carso.
 - Largest employers
 - Wal-Mart 194,000
 - FEMSA 178,000



Politics

- Andrés Manuel López Obrador took office as President in December 2018.
 - Member of historical PRI (Partido Revolucionario Institucional).
 - Former head of Federal District



Crime

- Drug-related violence in **some** areas.
 - Cartels fight for control of drug traffic .
- Main threat is everyday crime
 - As in Mexico City



History

- Political turmoil.
 - Independence from Spain in 1821
 - 25 presidents in next 28 years
 - Santa Anna became president 11 times.
 - French rule 1864-76.



Antonio López de
Santa Anna








Mexican Territorial Loss

TERRITORIAL GROWTH

COLONIAL PERIOD: 1775

-  Original Thirteen Colonies
-  Other British territories

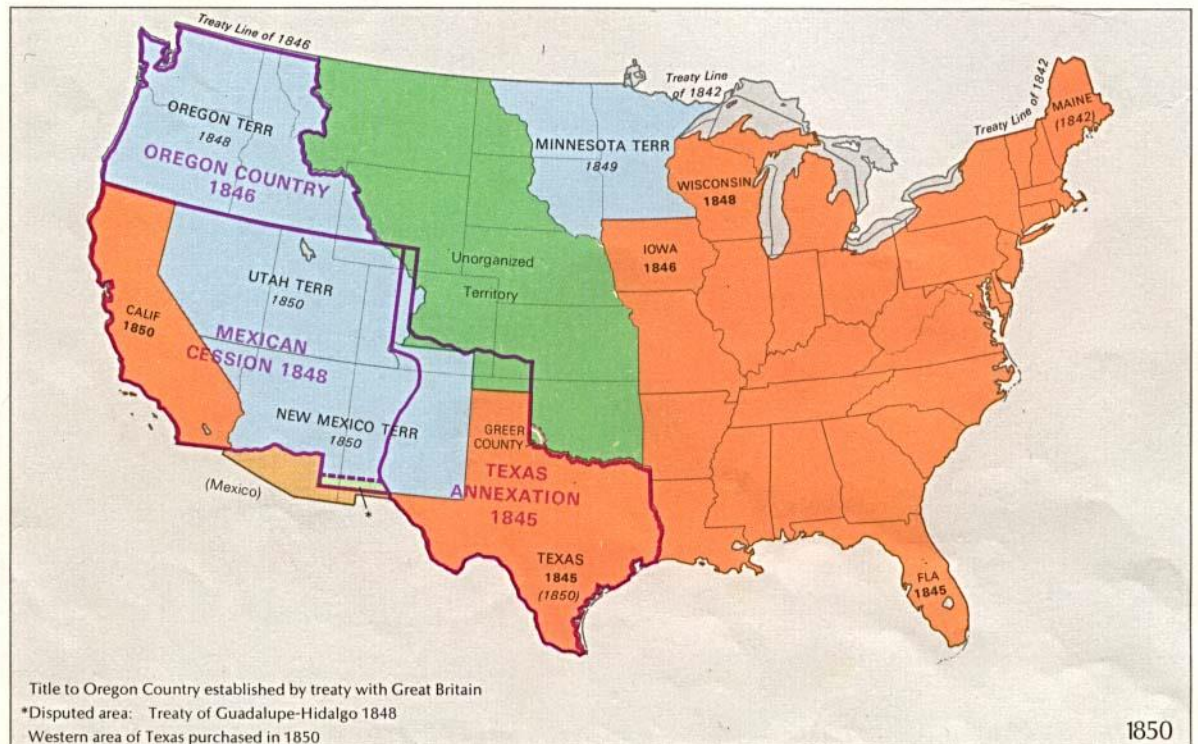
UNITED STATES: 1790–1920

-  States
-  State claims
-  Special status areas
-  Territories
-  Unorganized territories
-  Claimed areas
-  Foreign areas

- 1803** Dates of territorial acquisitions
- 1805** Dates of initial territorial organization
- (1809)** Dates of latest change within given time period
- 1812** Dates of admission to the Union

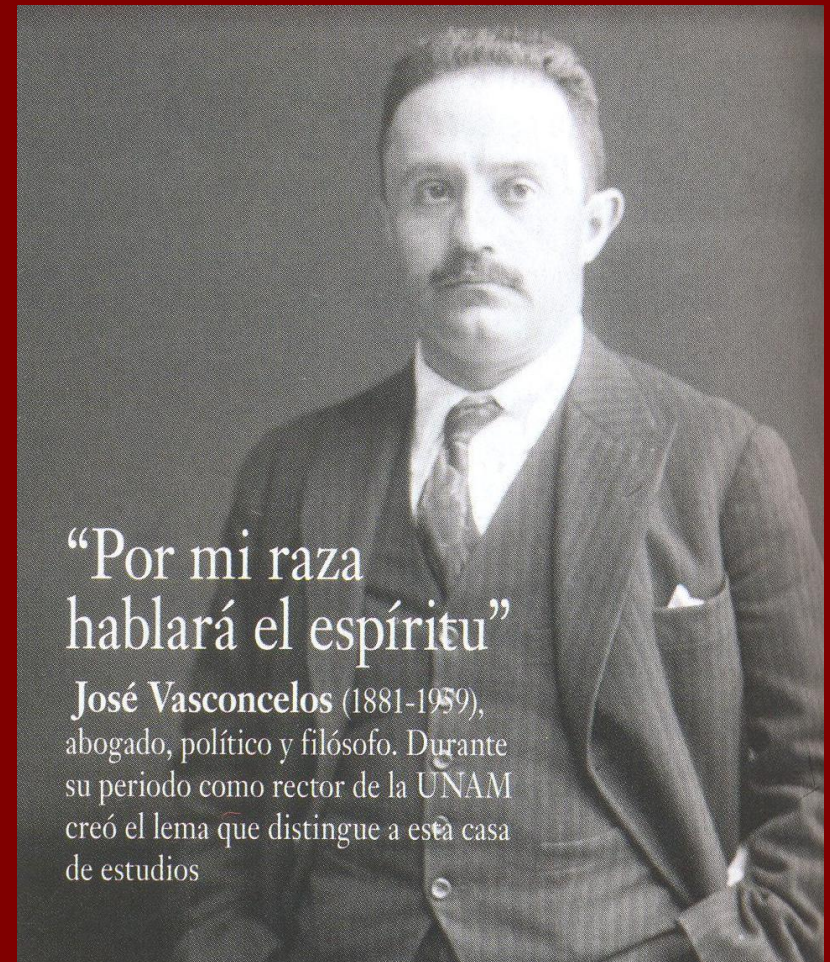
Map scale 1:34,000,000

Compiled by H. George Stoll, Hammond Incorporated, 1967;
rev. by U.S. Geological Survey, 1970



History

- A *mestizo* culture.
 - A people of mixed European/indigenous ancestry.
 - Differs from U.S. concept of race.
 - *Mestizos* can belong to upper classes.
 - Concept of *La Raza Cómica* from 1920s.



“Por mi raza
hablará el espíritu”

José Vasconcelos (1881-1959),
abogado, político y filósofo. Durante
su periodo como rector de la UNAM
creó el lema que distingue a esta casa
de estudios

Cultural Background

- Westerners created an environment too unstable for their own rule-based culture to survive.
 - The culture remains polychronic.



Mexico City street scene

Cultural Background

- High-context
 - Indirect communication historically increased safety.
 - Mexicans are good at reading body language.



Cultural Background

- High-context
 - Indirect communication historically increased safety.
 - Mexicans are good at reading body language.
- High power distance.



Cultural Background

- Family oriented
- Polite to visitors
 - Southwest U.S. reflects *El Norte* culture of northern Mexico.



Cultural Background

- High uncertainty-avoidance
 - Legacy of Aztecs
 - Bureaucracy as ritual.
 - Western bureaucracy runs things.
 - Mexican bureaucracy provides sense of security.



Moctezuma II

Cultural Background

- Strong religious belief
 - especially among lower classes and indigenous people.
 - Manages the stress of a tumultuous history.
 - Importance of symbol vs. image.



Catedral de Oaxaca

Cultural Background



Our Lady of
Guadalupe

Appeared to
Juan Diego,
1531

Example of
syncretism



Cultural Background



Pilgrimage to
Basilica of
Guadalupe,
Mexico City

Cultural Background

- Emotionally intense.
 - Dionysian culture
 - Holy Week observance.
 - Displays of affection.
 - Noisy parties, festivals, singing, etc.



Stages of the Cross

Names

Address as:
Señor Rodríguez

Carlos
Rodríguez
Vargas

Address as:
Señora Gonzáles

Ana María
Gonzáles
Fuentes

Jesús
Rodríguez
Gonzales



Names

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Ana María
Gonzáles
Fuentes

Jesús
Rodríguez
Gonzales

Or: Carlos Rodríguez V.

Names

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Carlos
Rodríguez
Vargas

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Ana María
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Fuentes

Jesús
Rodríguez
Gonzales

Old fashioned:
Ana María Gonzáles
de Rodríguez
= Señora de Rodríguez

Names

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Carlos
Rodríguez
Vargas

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Ana María
Gonzáles
Fuentes

Jesús
Rodríguez
Gonzales

*Conventions vary in
other Hispanic countries.*

Language

- OK to speak English.
 - If you know some Spanish, use it.
 - Mexicans are very patient with imperfect Spanish



Relationships

- Much relationship-building is done in restaurants.
 - Lunch is leisurely.
 - What to talk about?
La familia!



Mariachi musicians

Relationships

This is not
machismo



Relationships

- *Machismo* is important in Mexico
 - Arab origins, but it has evolved
 - Men can express emotion and ask for help.
 - *Machismo* in upper class entails fine sense of honor and devotion to family.
 - *Machismo* in lower class may entail violence.

Mayan Mathematics

- We have limited knowledge of Mayan culture
 - Spanish *conquistadores* destroyed 1000s of Mayan manuscripts.
 - Only 4 survive.
 - Maya language is spoken today.
 - Script has been largely deciphered.



Dresden codex

Mayan Mathematics



Mayan Mathematics

- The Maya developed sophisticated mathematics 2000 years ago to measure time.



Chichén
Itzá

Mayan Mathematics



- Calendars:
 - Sacred calendar (*tolzin*) = 260 days
 - “Solar” calendar = 365 days
 - Calendar round = Sacred + Solar = 18,980 days
 - Long Count calendar = 1,872,000 days

Mayan Mathematics

- Sacred calendar (*tolzin*)
 - 13-day cycle (including good days and bad days)
 - 20-day cycle (corresponding to 20 gods)

260-day
sacred
calendar



Mayan Mathematics

- Sacred calendar (*tolzin*)
 - The days aren't just numbers.
 - They are gods.
 - The cycles run in parallel.
 - Because 13 and 20 are mutually prime, the calendar repeats after $13 \cdot 20 = 260$ days.



Imix, god
corresponding
to number 1

Mayan Mathematics



- “Solar” calendar (*haab*)
 - 20-day cycle, denoted by numerals (base 20 number system)
 - 18-day cycle, corresponding to 18 gods.

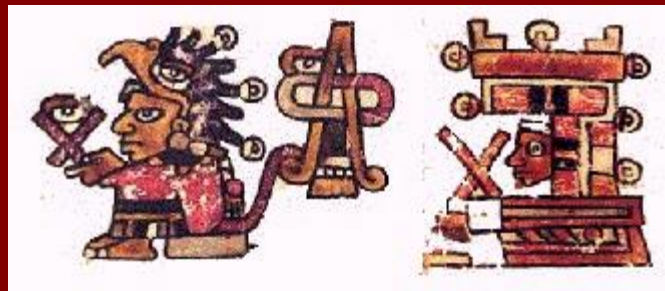
Mayan Mathematics

- “Solar” calendar (*haab*)
 - Calendar consists of 18 cycles of 20 = 360 days.
 - 5 residual days added at the end
 - Total of 365 days.



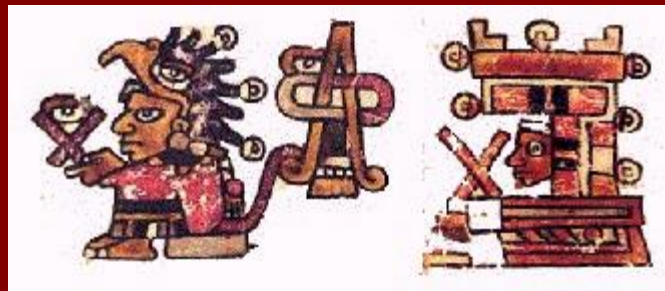
Mayan Mathematics

- “Solar” calendar (*haab*)
 - Maya observed that 1507 solar years = 1508 cycles of the “solar” calendar.



Mayan Mathematics

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 - This implies 365.24200 days/year, compared with modern value of 365.24198 (0.000005% error).



Mayan Mathematics

- “Solar” calendar (*haab*)
 - Maya observed that 1507 solar years = 1508 cycles of the “solar” calendar.
 - This implies 365.24200 days/year, compared with modern value of 365.24198 (0.000005% error).
 - Compare with 365.2475 days in Gregorian calendar, developed 15 centuries later in Europe (0.0015% error).



Mayan Mathematics



- Calendar Round
 - Sacred calendar (260 days) + Solar calendar (365 days) run in parallel
 - Duration = least common multiple of 260 and 365 = 18,980 days (about 52 years)

Mayan Mathematics



- Time between two Calendar Round dates
 - The Maya solved this problem routinely.

















Mayan Mathematics



- Time between two Calendar Round dates
 - The Maya solved this problem routinely.
 - This requires the Chinese Remainder Theorem, discovered in the West by Carl F. Gauss in 1801.
 - Discovered by Chinese in 13th century.
 - Maya knew the theorem 1200 years before the Chinese.

Mayan Mathematics

- Long Count calendar
 - Base 20 number system
 - 3rd position is base 18
 - Uses zero (also introduced by Jains in India about the same time)

0	1	2	3	4
	•	••	•••	••••
5	6	7	8	9
	• 	•• 	••• 	•••• 
10	11	12	13	14
	• 	•• 	••• 	•••• 
15	16	17	18	19
	• 	•• 	••• 	•••• 

Mayan
numerals

Mayan Mathematics

- Long Count calendar
 - Base 20 number system
 - 3rd position is base 18
 - Uses zero (also introduced by Jains in India about the same time)
 - For example, date 9.0.19.2.4 =

$$9 \cdot 18 \cdot 20^3 + 0 \cdot 18 \cdot 20^2 + 19 \cdot 18 \cdot 20 + 2 \cdot 20 + 4$$



9 *baktuns*



0 *katuns*



19 *tuns*



2 *uinals*



4 days

Mayan Mathematics



- Long count calendar:
 - Great Cycle is 13 *baktuns*
= $13 \cdot 18 \cdot 20^3 = 1,872,000$ days
(about 5125.36 years)

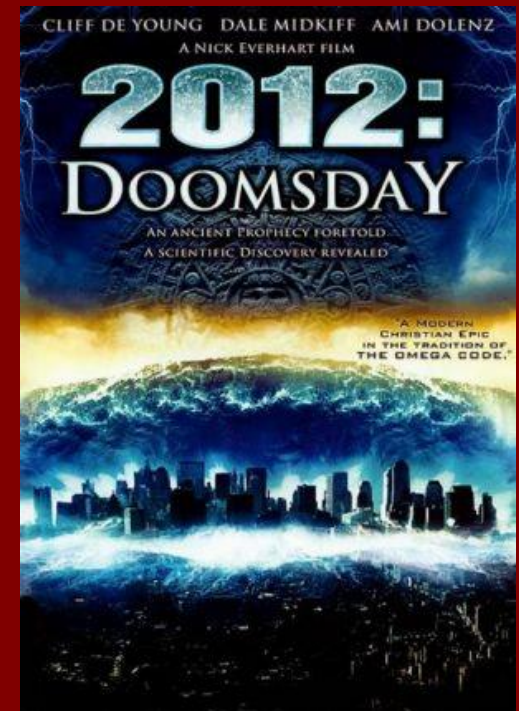
Mayan Mathematics



- Long count calendar:
 - Great Cycle is 13 *baktuns*
= $13 \cdot 18 \cdot 20^3 = 1,872,000$ days
(about 5125.36 years)
 - Beginning of previous Great Cycle fixed at
4.20, 8.18 = 11 Aug 3114 BCE on Gregorian
Calendar

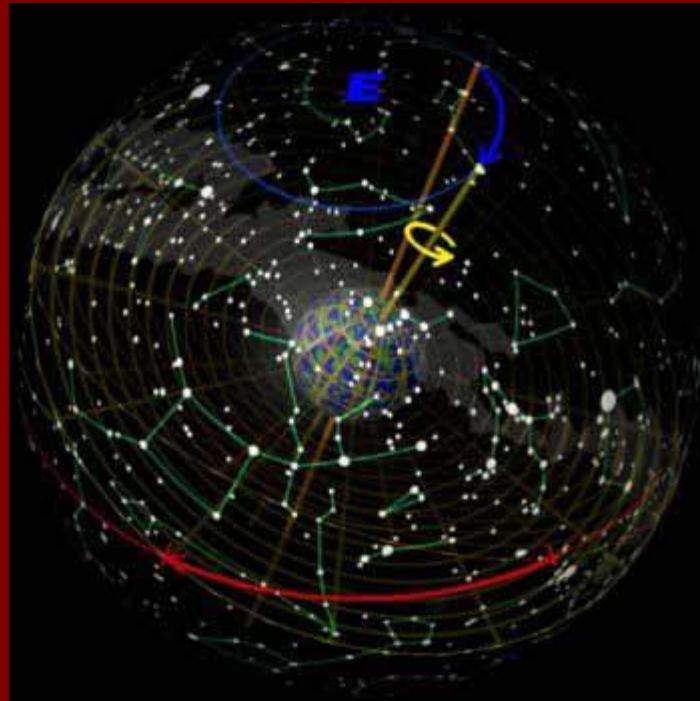
Mayan Mathematics

- Long count calendar:
 - Great Cycle is 13 *baktuns*
= $13 \cdot 18 \cdot 20^3 = 1,872,000$ days
(about 5125.36 years)
 - Beginning of previous Great Cycle fixed at
4.20, 8.18 = 11 Aug 3114 BCE on Gregorian
Calendar
 - Last day of previous Great Cycle was
21 Dec 2012 CE.



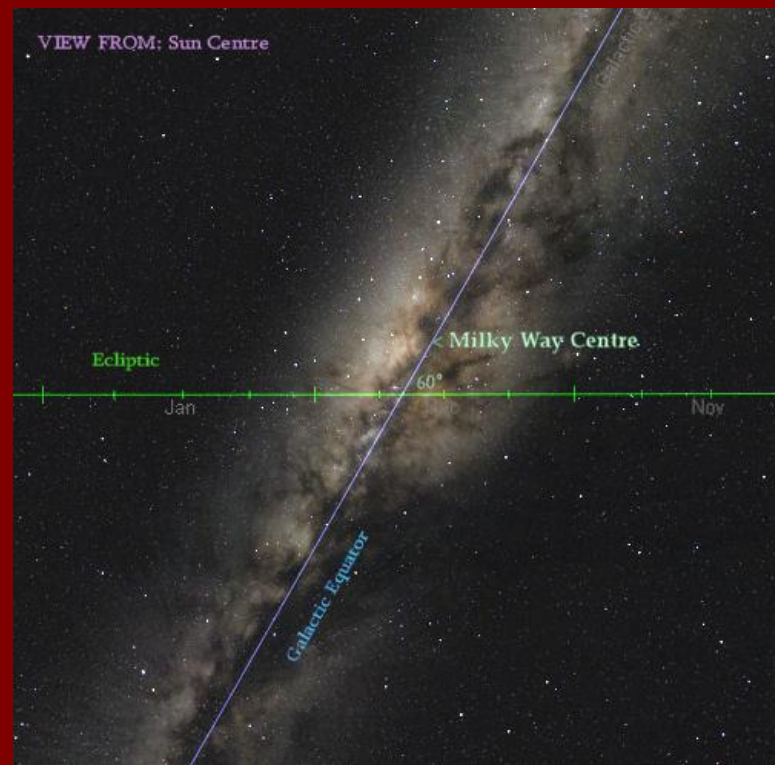
Mayan Mathematics

- Precession of the equinoxes
 - Earth's axis wobbles once about every 25,700 years.



Mayan Mathematics

- Precession of the equinoxes
 - The sun's path (ecliptic) crosses the equatorial plane of the Milky Way at about a 60° angle.



Mayan Mathematics



- Precession of the equinoxes
 - Due to precession, the sun aligned with the galactic equator at sunrise on the winter solstice in 2012, or thereabouts.
 - Hard to define observationally exactly what the galactic equator is.

Mayan Mathematics



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 - **21 Dec 2012** was the winter solstice.

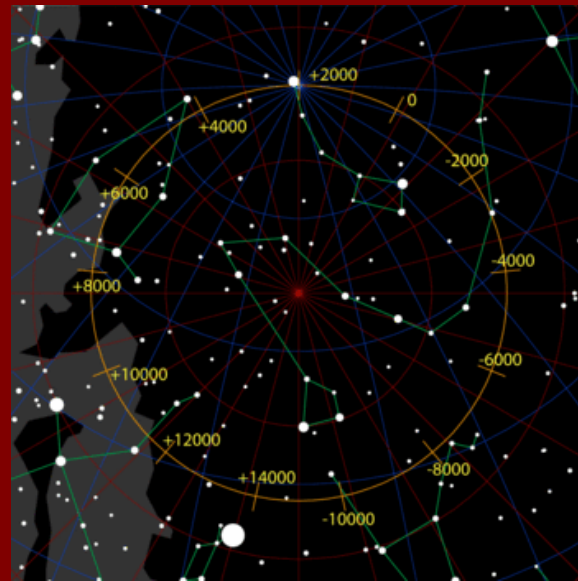
Mayan Mathematics



- Precession of the equinoxes
 - Due to precession, the sun aligned with the galactic equator at sunrise on the winter solstice in 2012, or thereabouts.
 - Hard to define observationally exactly what the galactic equator is.
 - **21 Dec 2012** was the winter solstice.
 - It is hypothesized that the Maya fixed the end of the Great Cycle to this date.
 - Maya were very interested in the Milky Way.

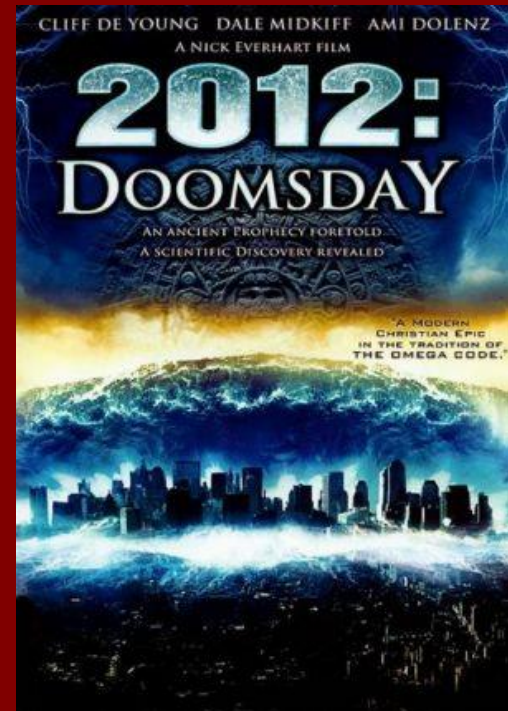
Mayan Mathematics

- Precession of the equinoxes
 - The period of the precession (approx. 25,700 years) is close to 5 Great Cycles (25,627 years).
 - The period varies slightly as the moon recedes from the earth.



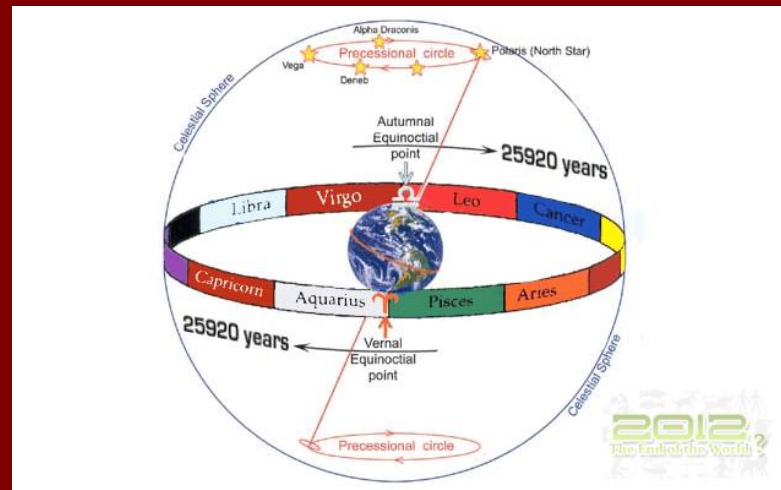
Mayan Mathematics

- Why preoccupation with time?
- Did Maya predict end of the world?



Mayan Mathematics

- We don't know Maya interpretation of end of the Great Cycle.
 - No reason to believe they predicted doomsday.
 - Some inscriptions bear dates beyond 21 Dec 2012.



Mayan Mathematics

- Knowledge of the future relieves uncertainty.
 - Each day controlled by known gods.
 - Mayan society was highly stressed.
 - Resource depletion and resulting warfare.



The Rest of Latin America



The Rest of Latin America

