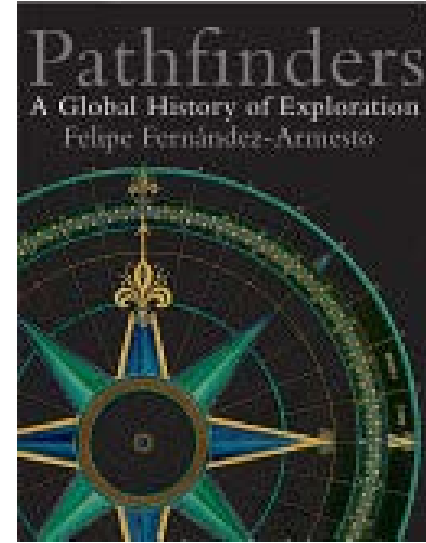




Geog 126: Maps in Science and Society

Oceans, Currents, the shape of the
world and the age of discovery

Felipe Fernández-Armesto

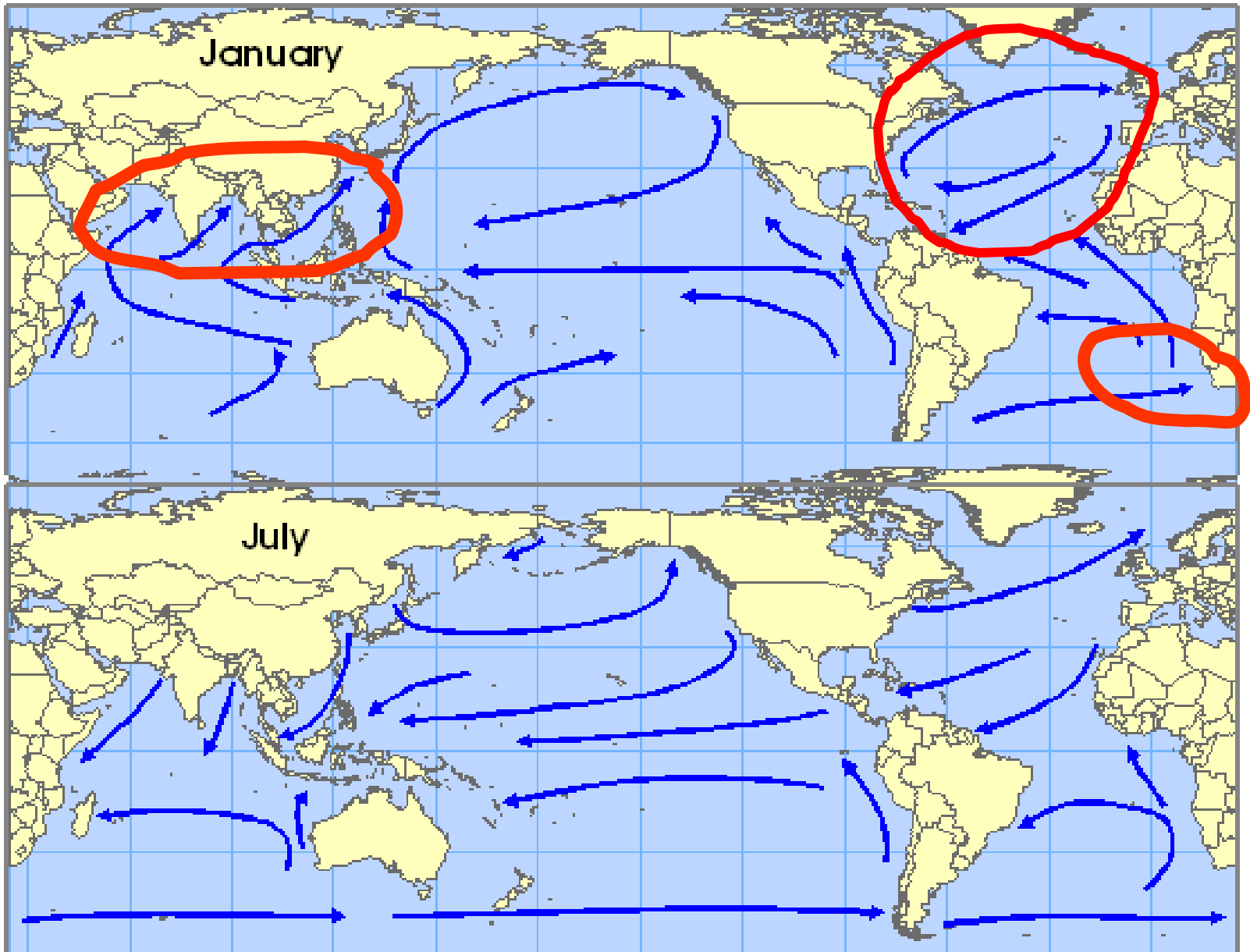


- *Pathfinders: A Global History of Exploration*

Central Thesis

- Wind patterns dictated sailing
- Early exploration used seasonal reversal
- Explorers preference was to counter a prevailing wind to guarantee a safe return

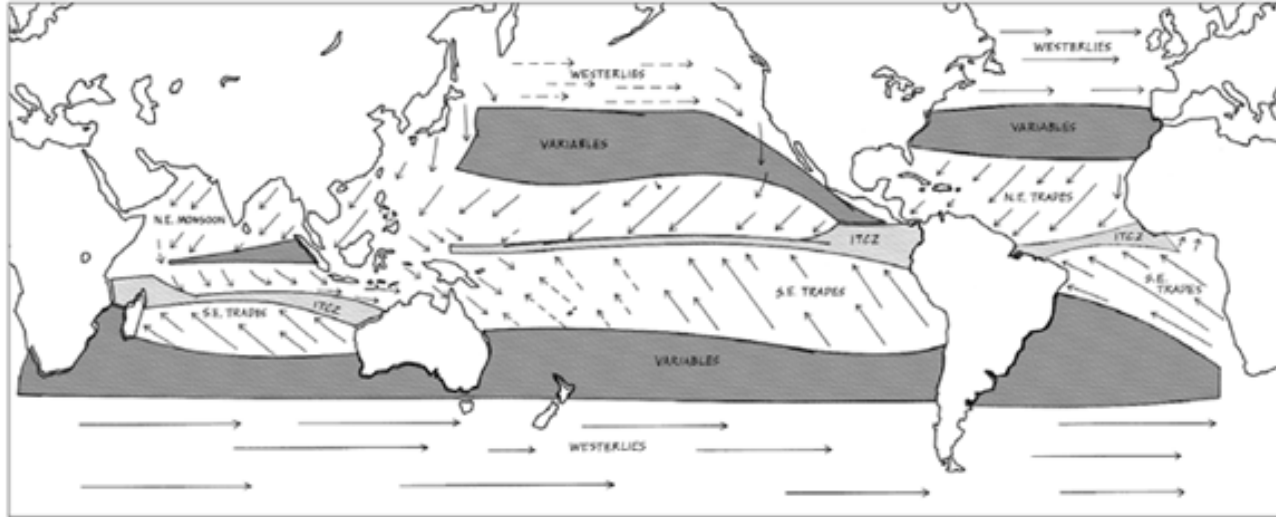
Global wind patterns



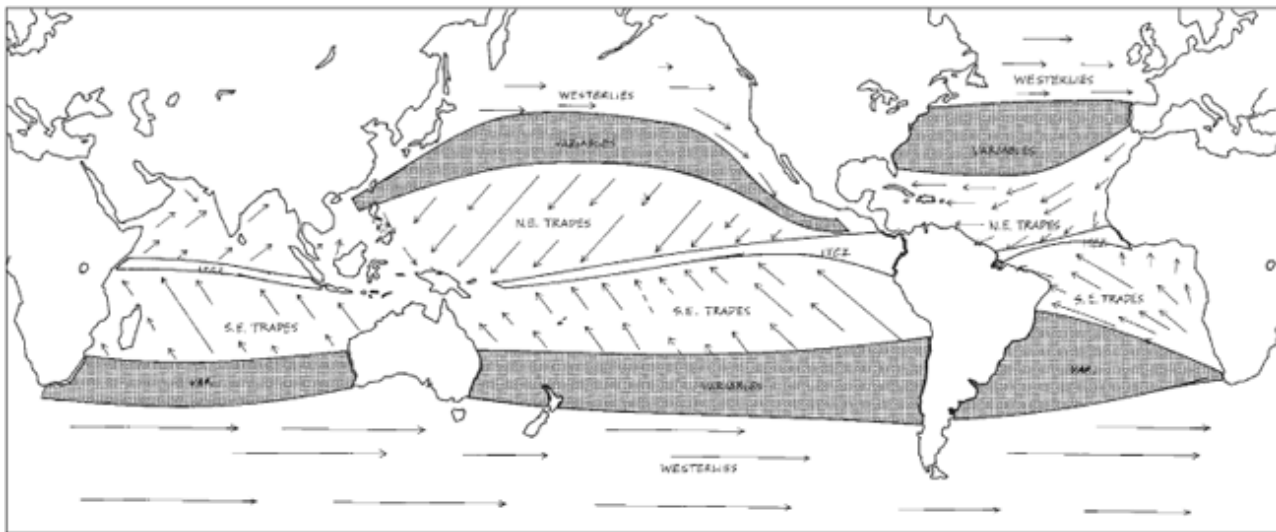
Source: adapted from M. Tomczak and J.S. Godfrey (1994) *Regional Oceanography: An Introduction*, London: Pergamon.

Trade winds

January - March

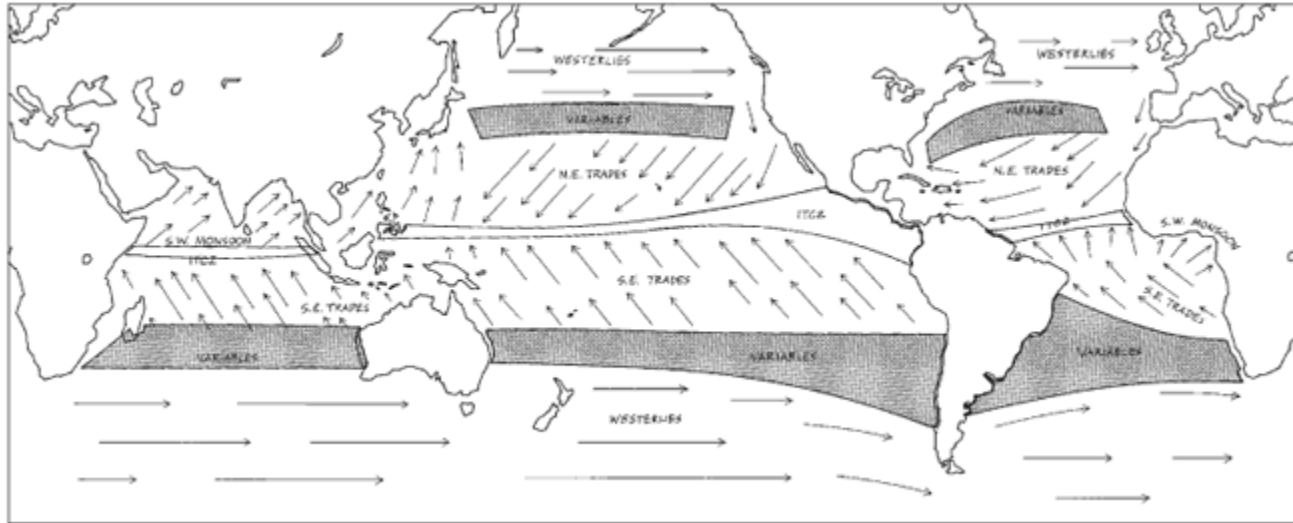


April - June

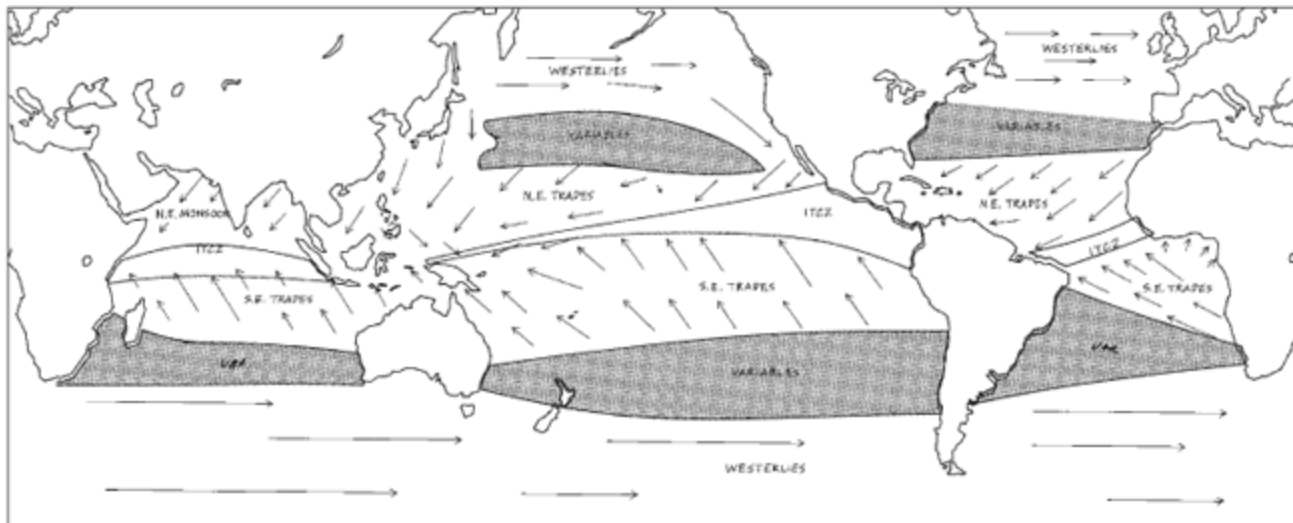


Trade winds

July - September



October - December



Yu ji tu (Map of the tracks of Yu the great) 1136



Seasonal Reversal

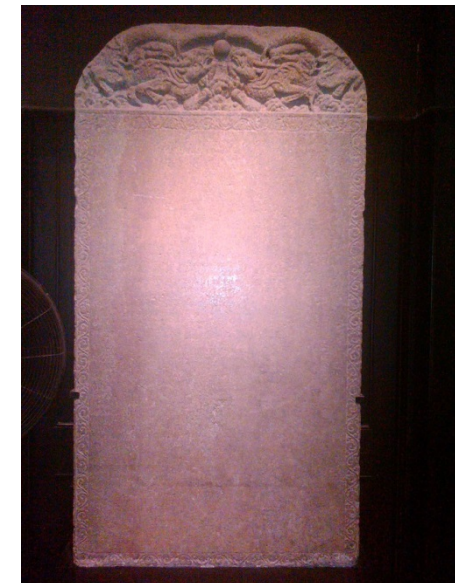
- Under Chinese Emperor Yongle (1402-1424)
- Seven expeditions under Admiral Zheng He between 1405 and 1433
- He was a Muslim Mongul “A barbarian”
- Visited 32 contemporary countries
- First expedition was 62 of the largest sea-going junks ever built (c 3000 t)
- Used 24 point compass

Zheng He

- Aka Cheng Ho, original name Ma Sanbao, later Ma He
- born c. 1371, Kunyang, near Kunming, Yunnan province, China
- died 1433, Calicut [now Kozhikode], India



Replica in Nanjing

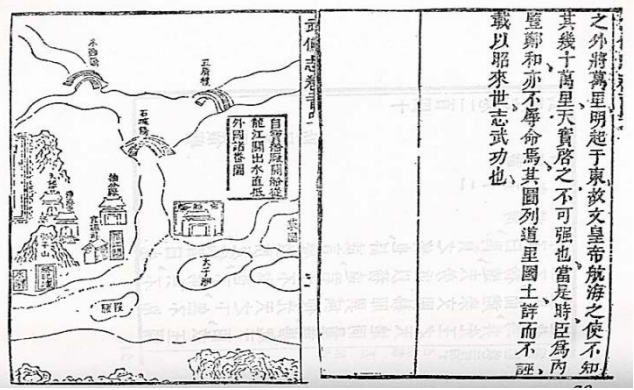
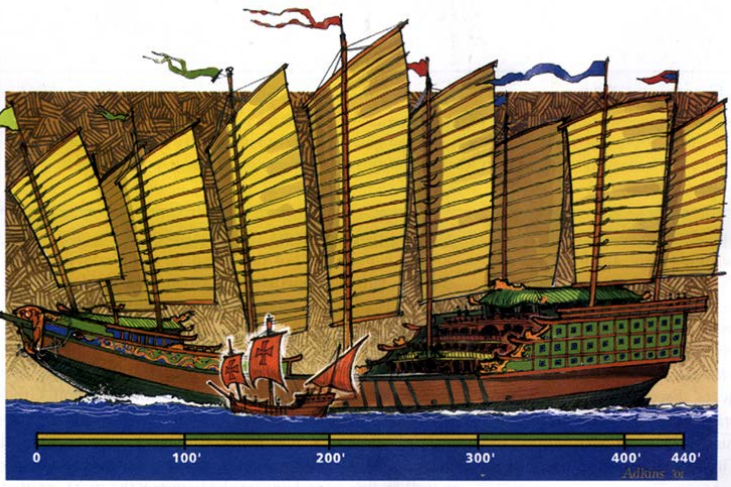


Fra Mauro Atlantic 1420: Junk?



Traveling in Style

- 62 junks, 225 support vessels, 27,780 men
“Treasure ships”
- 1405-11 Malabar Coast, Siam, Malaya, Java, Sumatra, Ceylon
- 1413-15 Maldives, Ormuz, Jiddah. Brought back 19 envoys and a giraffe
- 1416-19 Similar
- 1421 Mogadishu, Mombassa, Malindi, Zanzibar, Dar es Salaam, Kilwa
- 1431-33 Longest trip: 12,618 miles



MING CHINA 1368 - 1644

- 1368 Ming dynasty est. at Nanking
- 1421 Capital moved to Peking
- 1522 Mongol incursions and to Japanese sea pirate attacks
- 1566

- China 1400
- China 1644

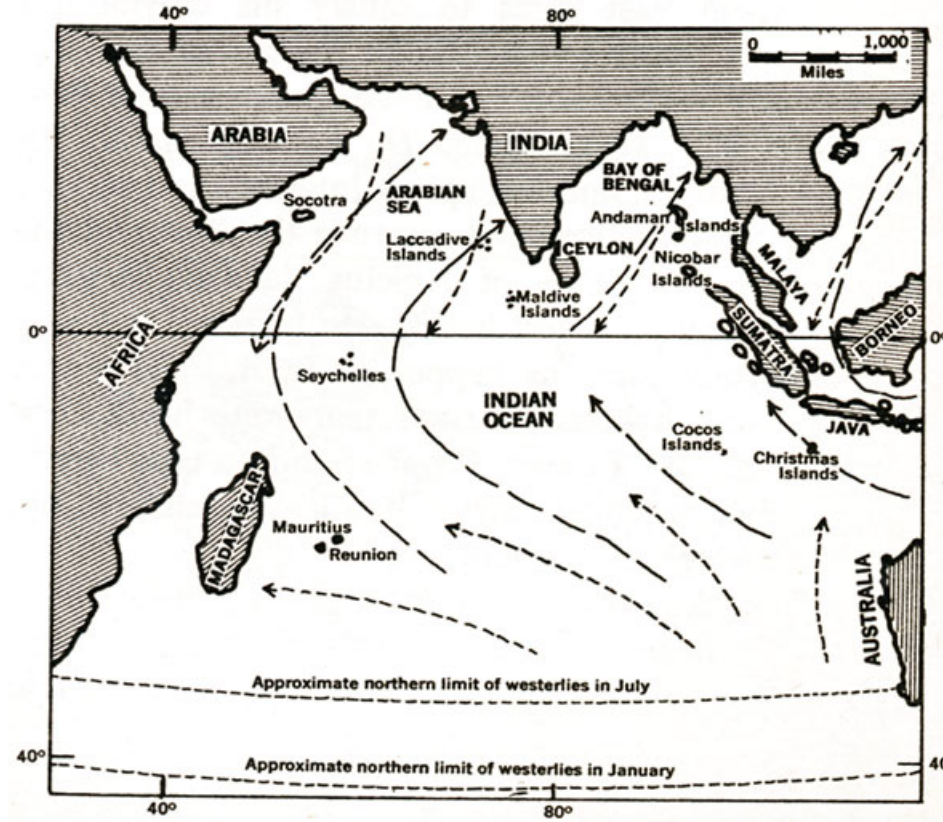


The mission

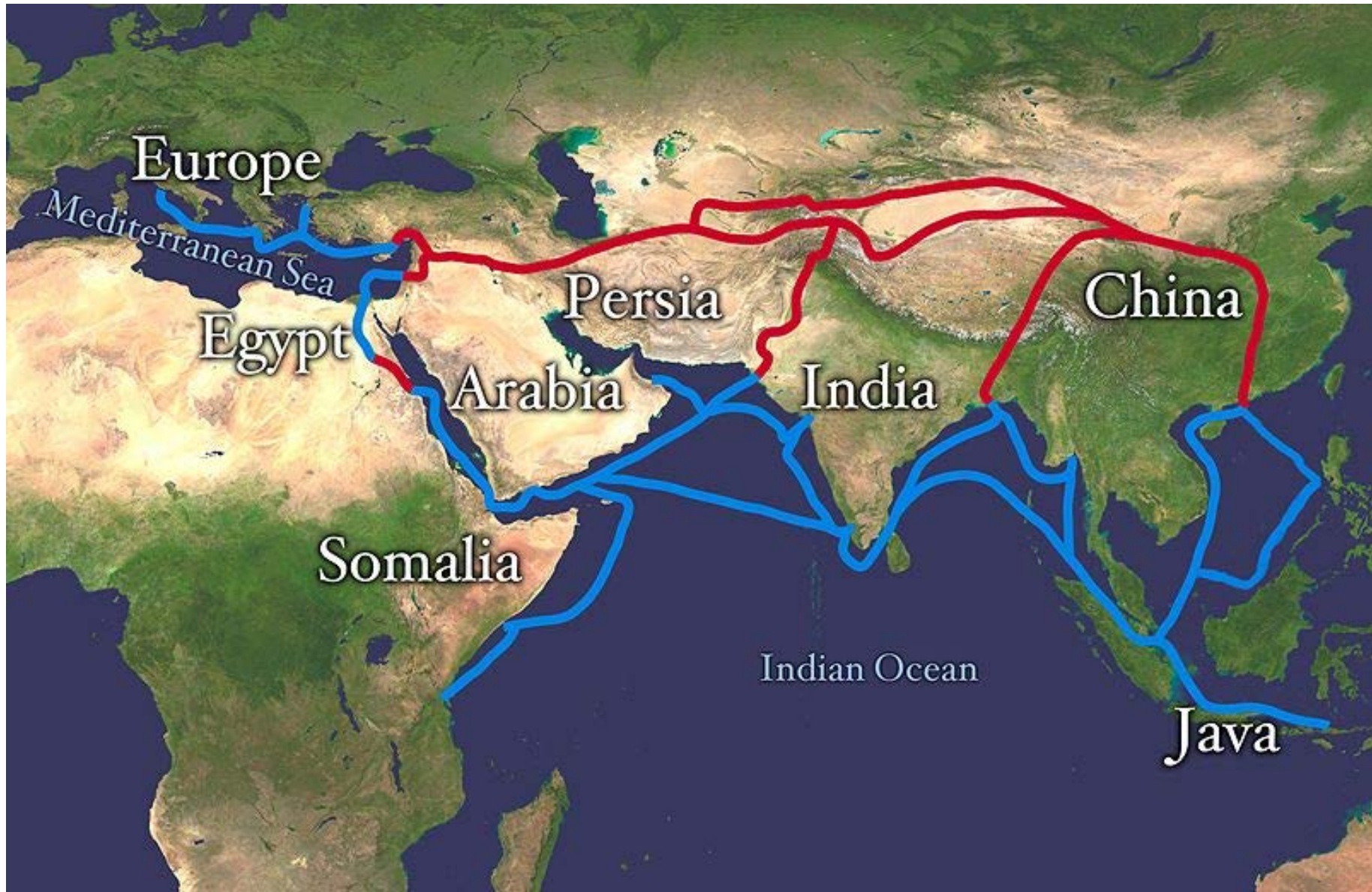
- Impress locals
- Influence local regimes: fought king of Ceylon, etc.
- Made sailing directions and took angles of pole star
- History written by Ma Huan
- Almost all materials destroyed when emperor changed, Hongxi cancels trips in 1424 then “defunds”

Monsoon Winds Promoted the Spice Trade

- Seasonal monsoon winds, which affected historic sailing routes in the Indian Ocean, were described by Hippalus about AD 45.
- The prevailing winds blow from the southwest from April to October and from the northeast from October to April.



Silk Routes: By land and by sea



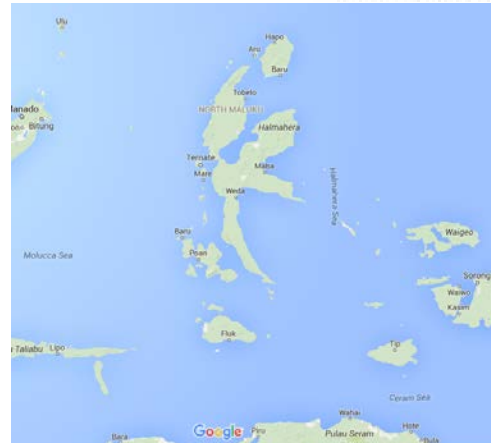
Age of Exploration

- Medieval world saw spice trade of East and Middle East dominated by Moslem merchants
- Eastern ports were Calicut, Columbo, and Malacca
- Mideast markets were Constantinople via India and the Far East to Hormoz in the Persian Gulf and Alexandria via the Red sea from Mecca
- Middle men were Venetians, who moved spices from the Mideast to the rest of Europe
- Conquest of Constantinople by the Turks in 1453 brought about the eventual decline of Venice as a great power
- The coup de grace was the rise of Portugal as a great sea power

Spice Trade Ports

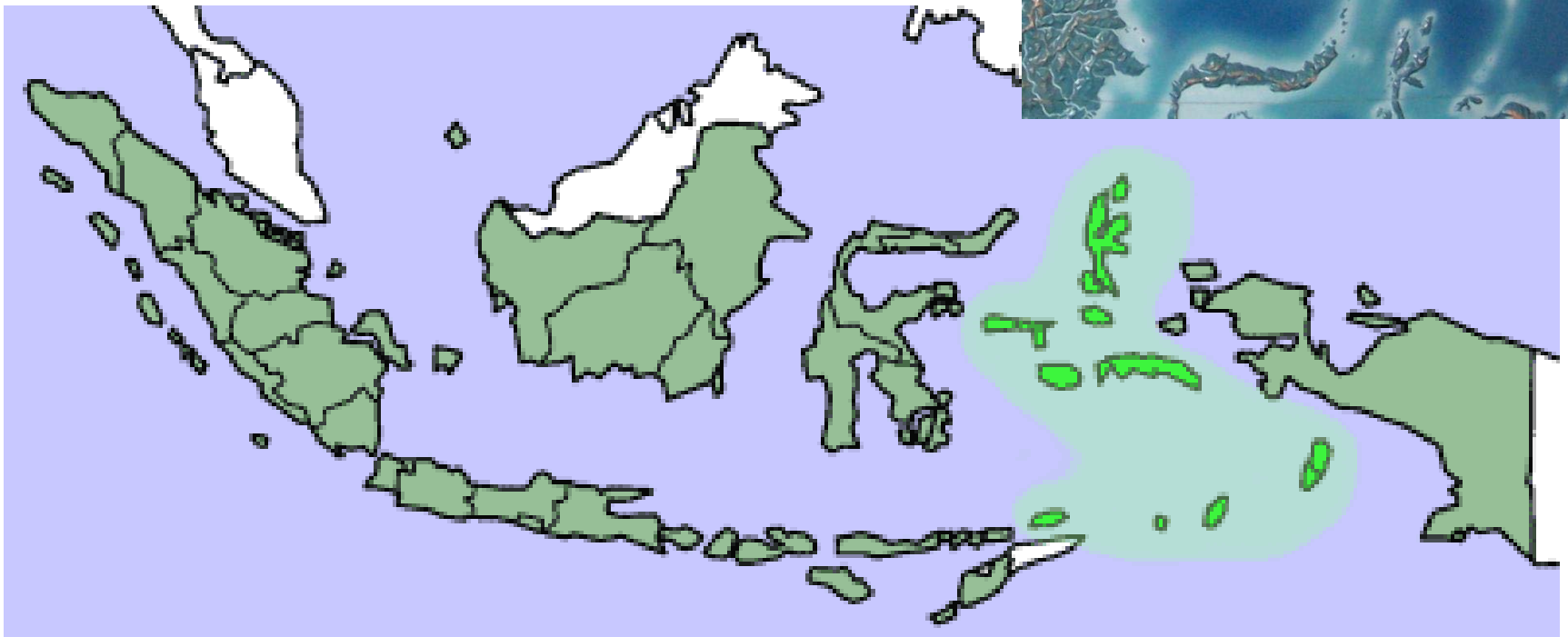
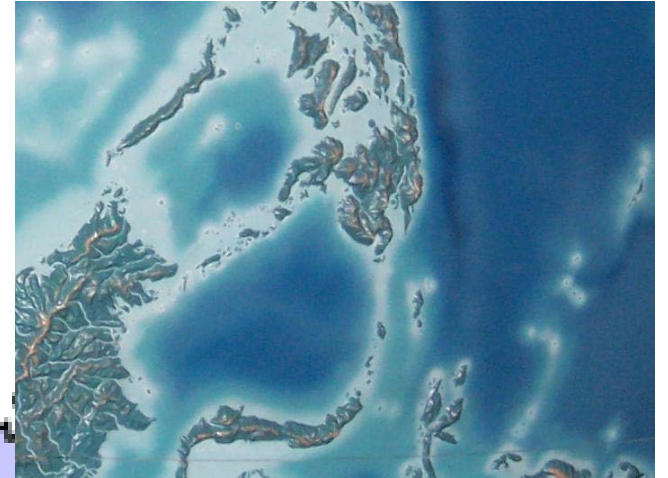


Celebes/Sulawesi



Nutmeg, Mace, Cloves

Maluku Islands, Indonesia

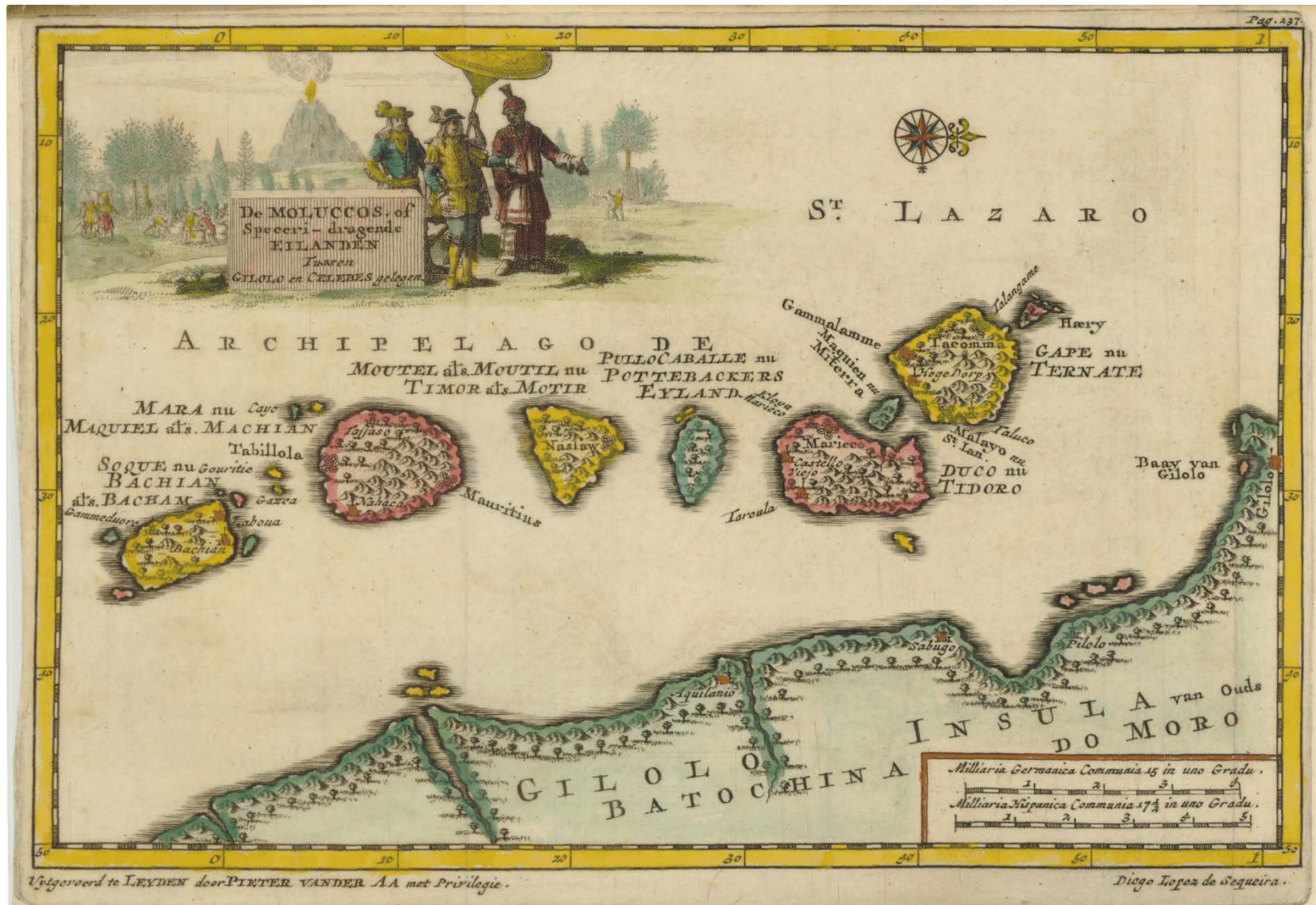


Cinnamon

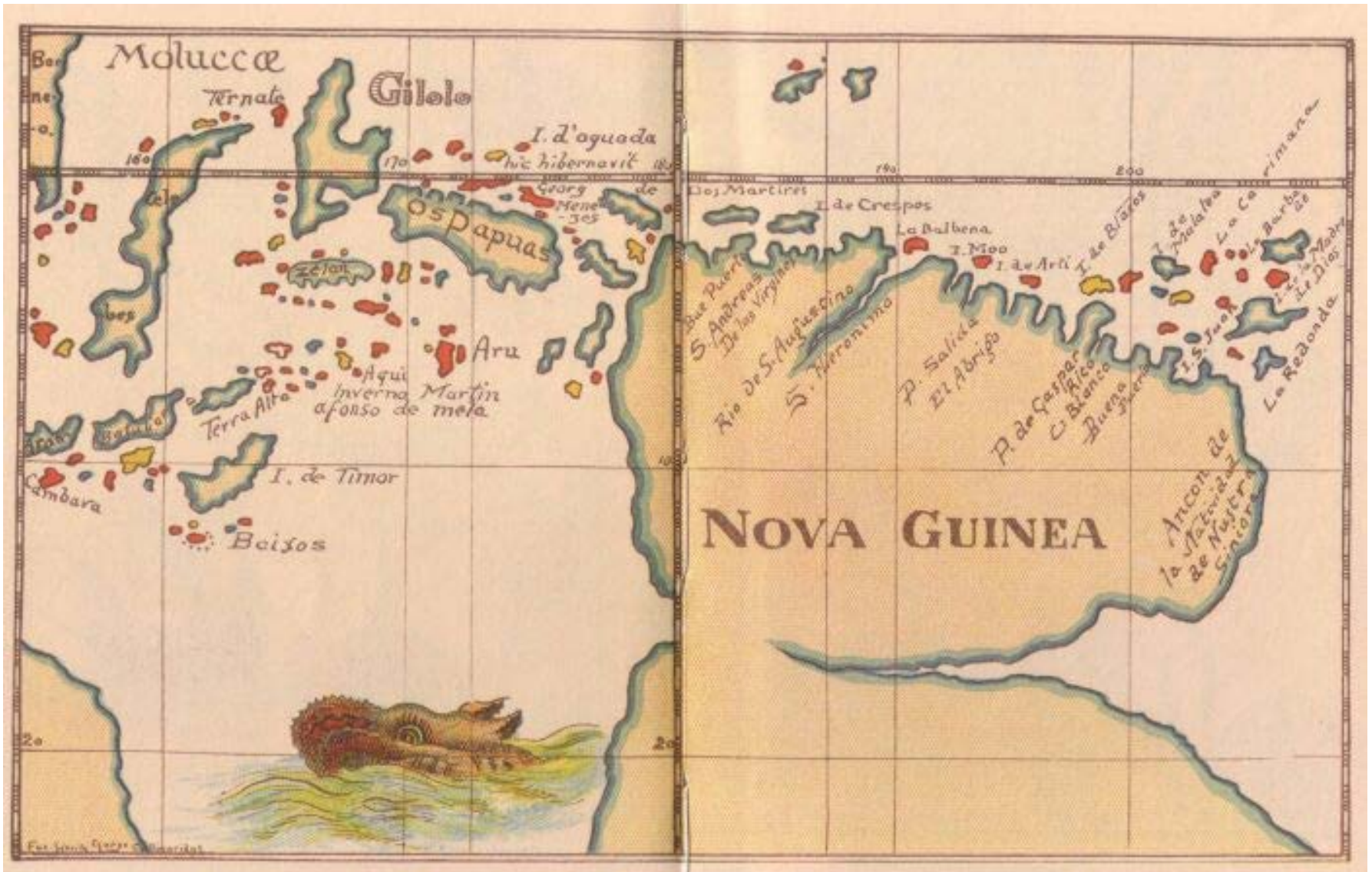


Cinnamon, cassia, cardamom, ginger, and turmeric
From America: Allspice, Red pepper

1683: Sanson, Nicolas, 1600–1667. “De Molukkische Eilanden, Celebes, Gilolo, enz.” From Sanson’s *Geographische en historische beschryvingh der vier bekende werelds-deelen . . .* (Utrecht, 1683). [Princeton Historic Maps Collection]



Ribero World Map 1529





Colombo

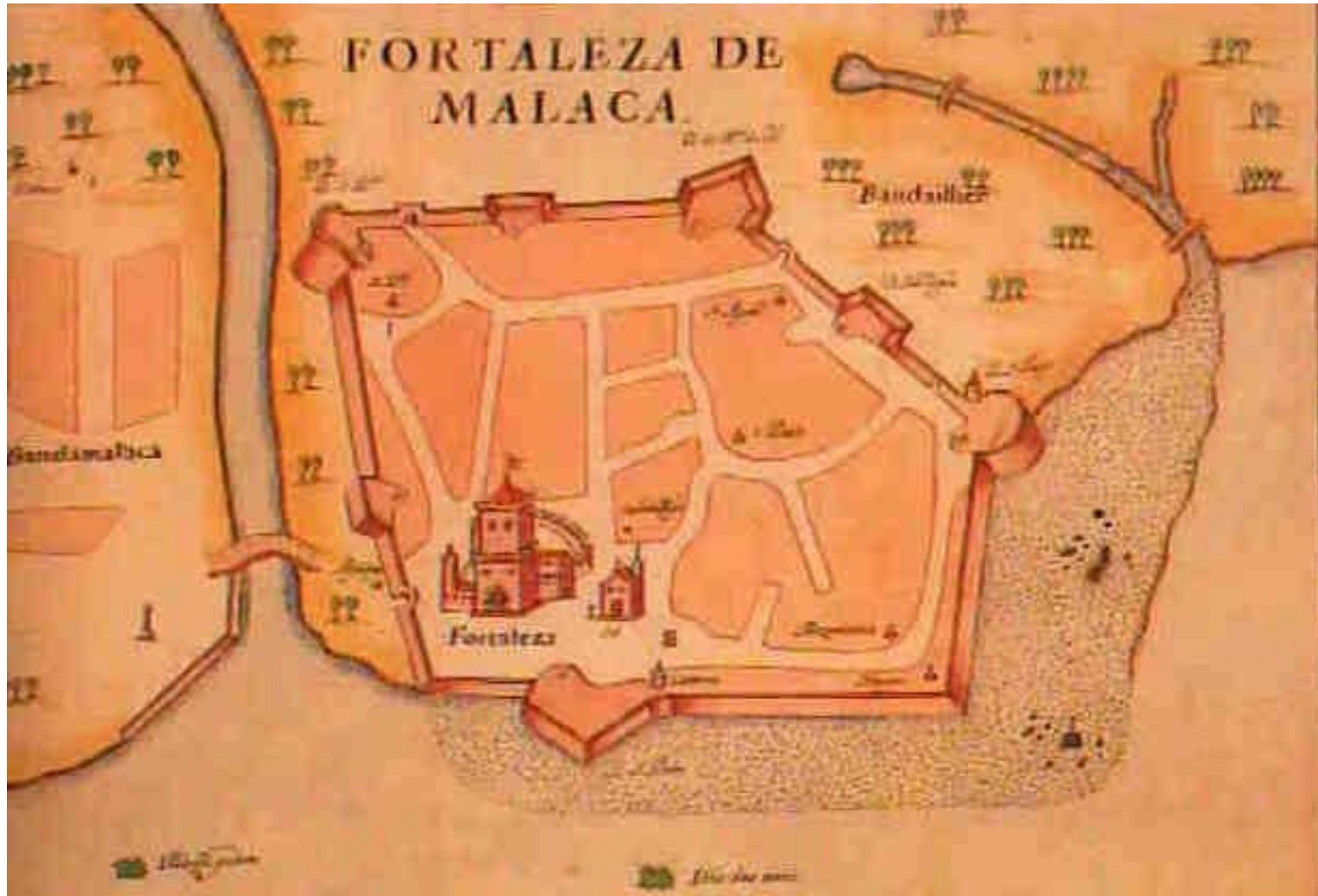
Malacca



Copper engraving, 'De Stadt Colombe' [The Town of Colombo], from Dutch book c. 1775, after original engraving by Johannes Kip of c. 1680



Livro das Plantas das Fortalezas, Cidades e Povoações do Estado da India Oriental 1600s. (about 1630: Portugal)

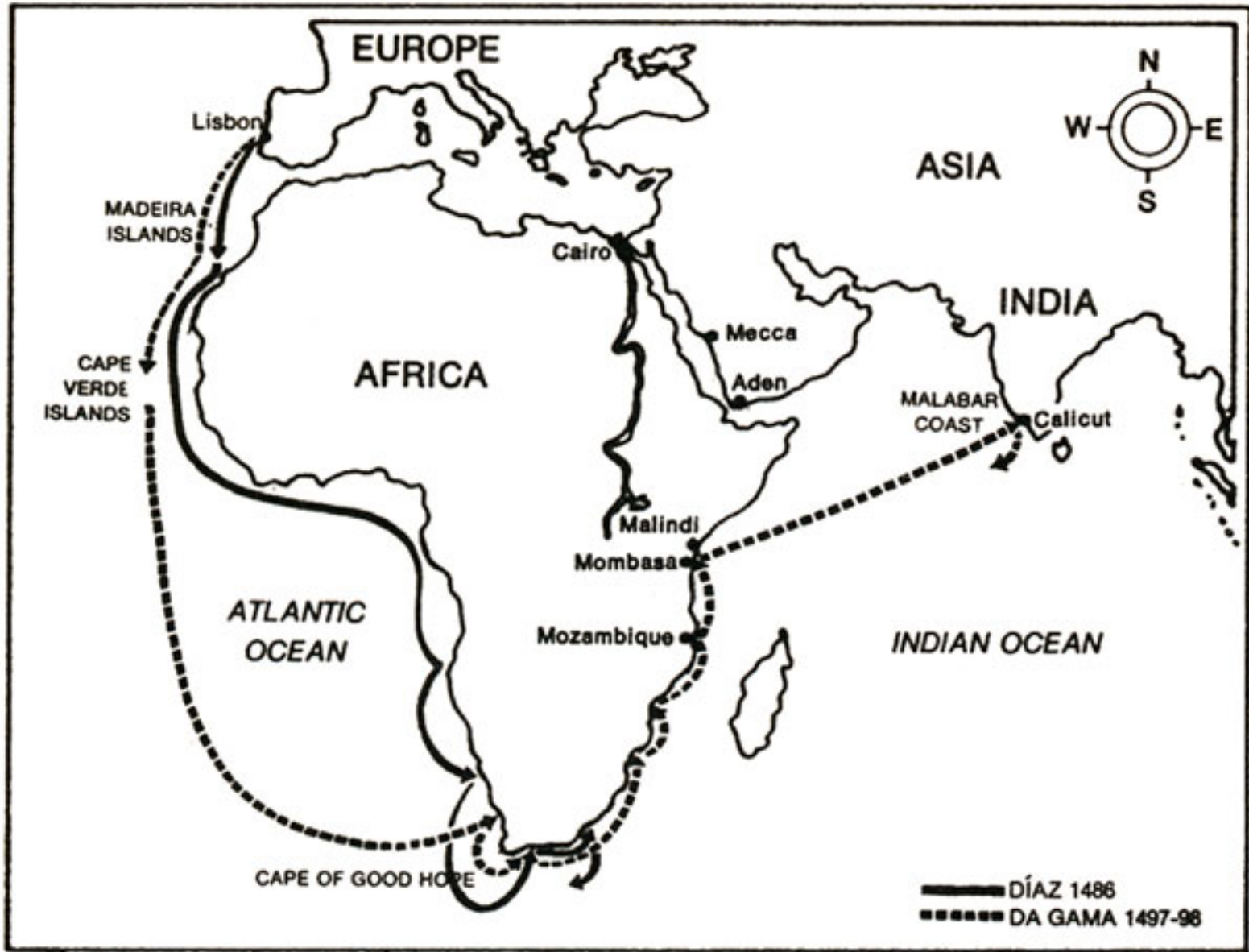


St. Paul's Melaca, Malaysia: 1521



Portuguese Discoveries

- Prince Henry the Navigator b. 1394. Establishes navigational school at Sagres.
- Convinced that India could be reached by sailing along coast of Africa
- Rise in navigational charts, instruments, and ship building (Caravel)
- 1460 – Portuguese reached Azores, Madeira, Senegal, Cape Verde Islands
- 1471 – Equator crossed
- 1487 – Bartolomeu Diaz (1500?-1550) doubled Cape of Good Hope proving Indian ocean is accessible by sea
- Pioneered approach of turning into the southeasterlies to round the cape
- 1487 – Pedro de Covilhao goes overland and by sea to Calicut, Goa, and Hormuz and whets the Portuguese appetite for spices.



Voyages of Diaz and Da Gama.

16th Century Caravels



Lateen vs. Square Rig



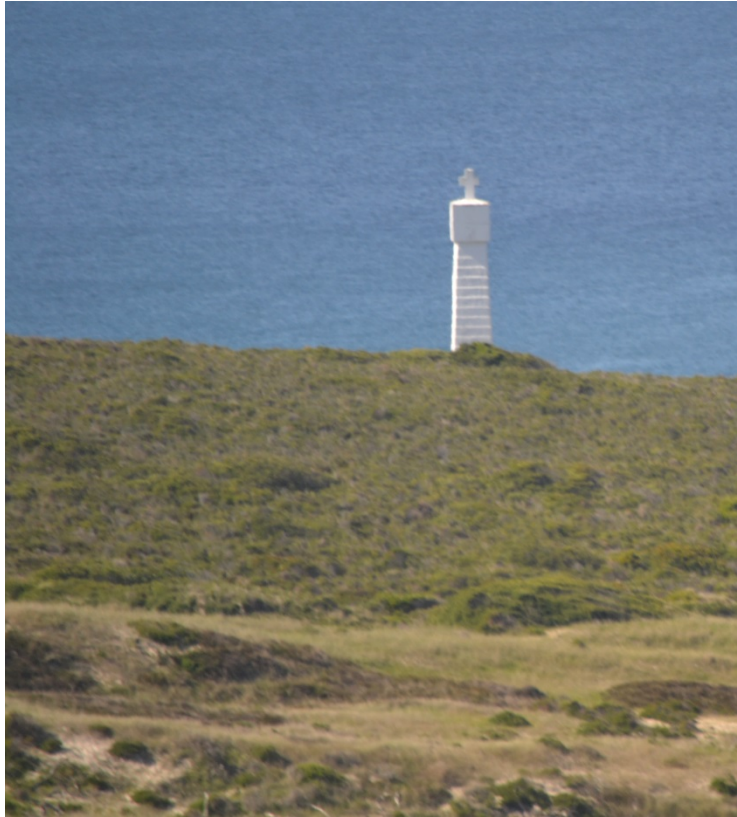


Vasco Da Gama (1469-1524)

Vasco da Gama

- Selected to lead new ocean expedition
- “Christians and spices”
- Departed 8 July 1497 with four square rig and a supply ship
- Passed 6000 miles out of sight of land—longest at time
- 4 Nov reaches Bay of St. Helens but trouble with locals
- 22 Nov reaches Cape 12 dec Capo de Recife (Dias’ last point)

At Cape Point



Da Gama in the Indian Ocean

- 17-20th reverses course as new currents encountered
- At KwaZulu Natal, gets back on course
- 10 Jan finds hospitable reception at R. Inharrime “Rich and hospitable”
- At Mozambique used local pilots (but flogs them)
- At Malindi, finds pilot for India



AFRICA

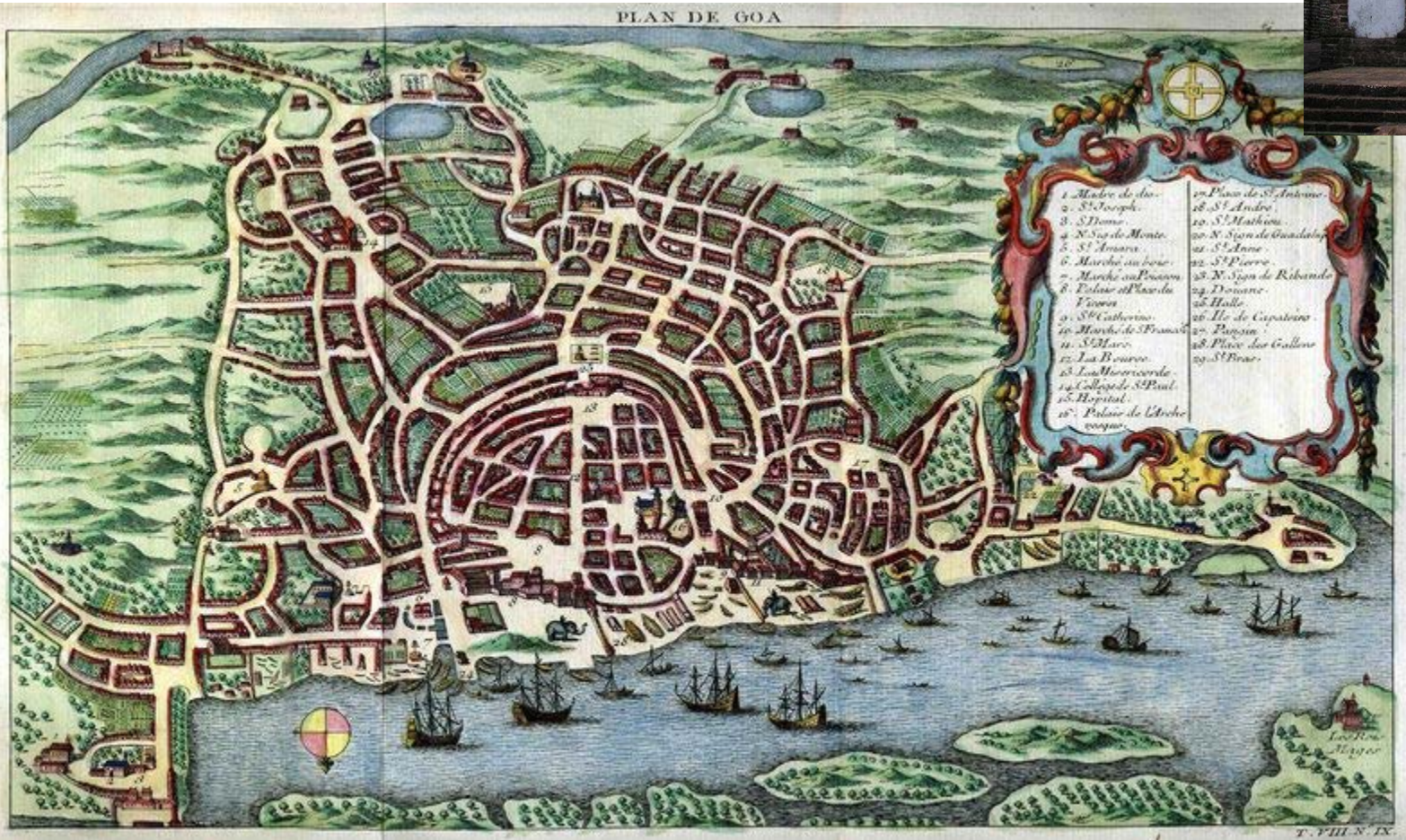
Malindi
Mombasa

Goa
Calicut

St. Helena Bay
Mossel Bay
Natal

Goa

"Plan de Goa", Índia.
Antoine François. 1750



The return(s)

- Ibn Majid's sailing directions to Mecca "captured" by Portuguese
- 23 day Monsoon crossing to Calicut by May 20th
- At Calicut, mistook Hinduism for a sect of Christianity
- Locals unimpressed by Portuguese trade goods
- "the entire land wished him ill"

Back to Lisbon

- Left small group at Calicut
- Started back 29 August (wrong time)
- Stopped at Aujediva Is.
- 7 January back to Malindi but with 50% of crew dead, rest with scurvey
- One ship abandoned, remaining two back to Portugal in July and August 1498
- Immediately promoted and praised (*Count of Vidigueira, 6th Governor and 2nd Vice-Roy of India*)

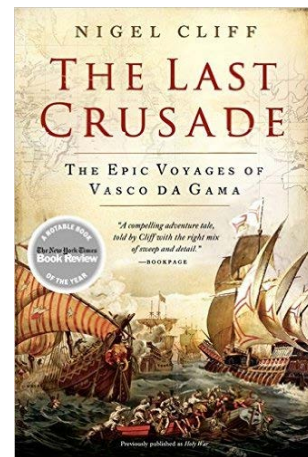
The Brutal Sequel

- Second voyage 1502
 - Bombarded Calicut after learning those left from first trip had been killed
 - Ambushed Indian Muslim ship MÎVÎ, loaded with over 100 rich merchants, stole goods, burned ship
 - “The last crusade”
- Third Voyage 1524
 - Captured Kilwa, destroyed Calicut fleet of 29 ships
 - Died of malaria in Goa
 - Body returned to Portugal in 1539
 - Buried at Vidiguenira

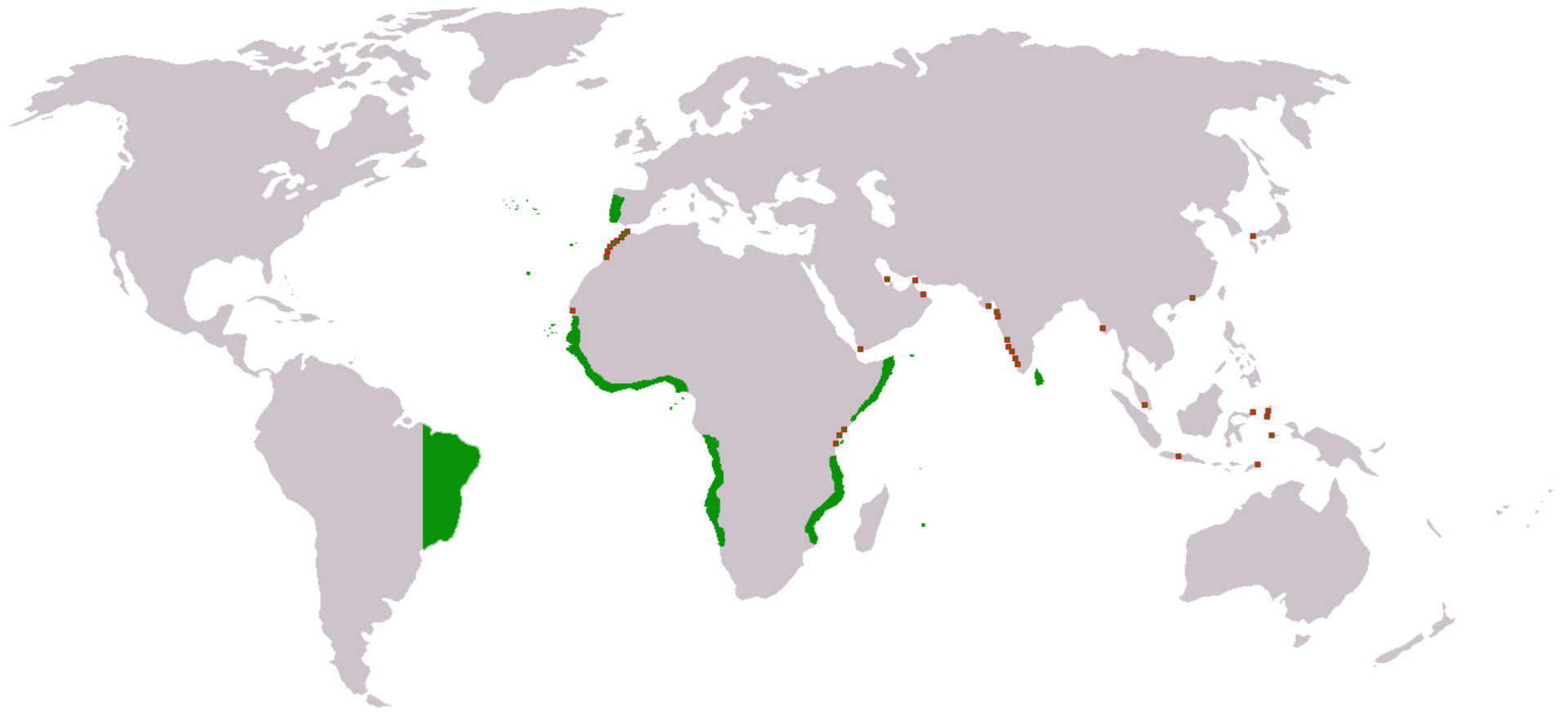


The lens of history

- “Vasco had made almost every mistake imaginable”
- Gasper Correia, a Portuguese historian, described his acts as unequaled in cold-blooded cruelty.
- 2011 Book Nigel Cliff: *The Last Crusade*
- Made very little impact on trade
- Huge impact on cartography
- Trip was not repeated for about 100 years
- Invigorated Portuguese expansionism



Portuguese Empire in 1530



An epilog

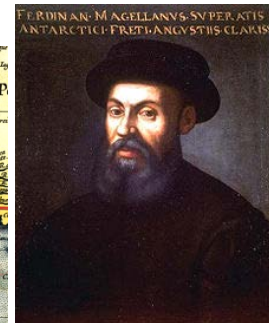
- In 1998, attempts to observe the five hundredth anniversary of Gama's arrival in India by the Government of Portugal had to be abandoned because of public antipathy towards the event

Portugal Masters of the Spice Trace

- Pedro Alvares Cabral sails off course and discovers Brazil for Portugal, later Madagascar
- Returns with 6 of 13 ships and a cool reception
- Retires and establishes spice factories
- Adventurer Amerigo Vespucci sent to Brazil and gives name to America
- da Gama in 1502 subjugates the Moslems and Portugal established control in India. (Goa was Portuguese until 1952)
- Ferdinand Magellan circumnavigates the globe in 1519 for Spain.
- Fleet discovers and locates spice islands

Ferdinand Magellan 1519-22

- Sought alternative route to Spice Islands, to claim them for Spain-5 Ships
- First to pass the Straits of Magellan
- Juan Sebastian de Elcano completes first circumnavigation (Enrique of Malacca).
- Took and captured several vessels
- Kidnapped pilots, resulting in Magellan's murder
- 18 out of 237 returned on the Victoria





Martin Waldseemüller's 1507 Universalis Cosmographia Secundum Ptholomaei Traditionem et Americi Vespucii Alioru[m]que Lustrationes, St. Dié, France.

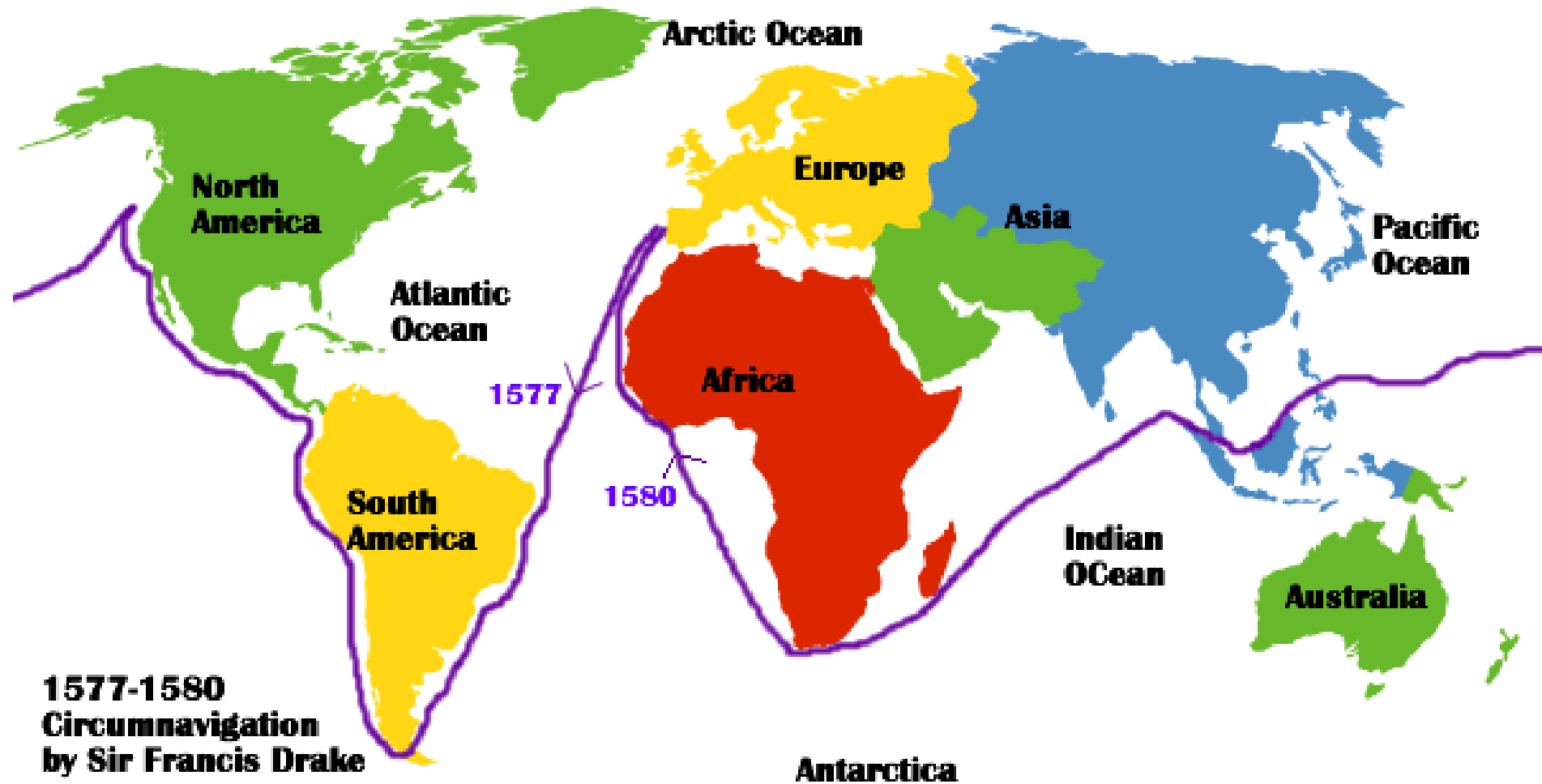


- 1492 – Christopher Columbus (1451-1506) thinks Portugal errs in sailing East, and looks for a western route
- Not a new concept: Strabo, 1500 years earlier notes: “If the extent of the Atlantic was not an obstacle, we might easily pass by sea from Iberia to India still keeping the same parallel.”
- By serendipity, Columbus discovers America in 1492
- Discovers *Capsicums* (red pepper) and *Pimenta dioica* (allspice)

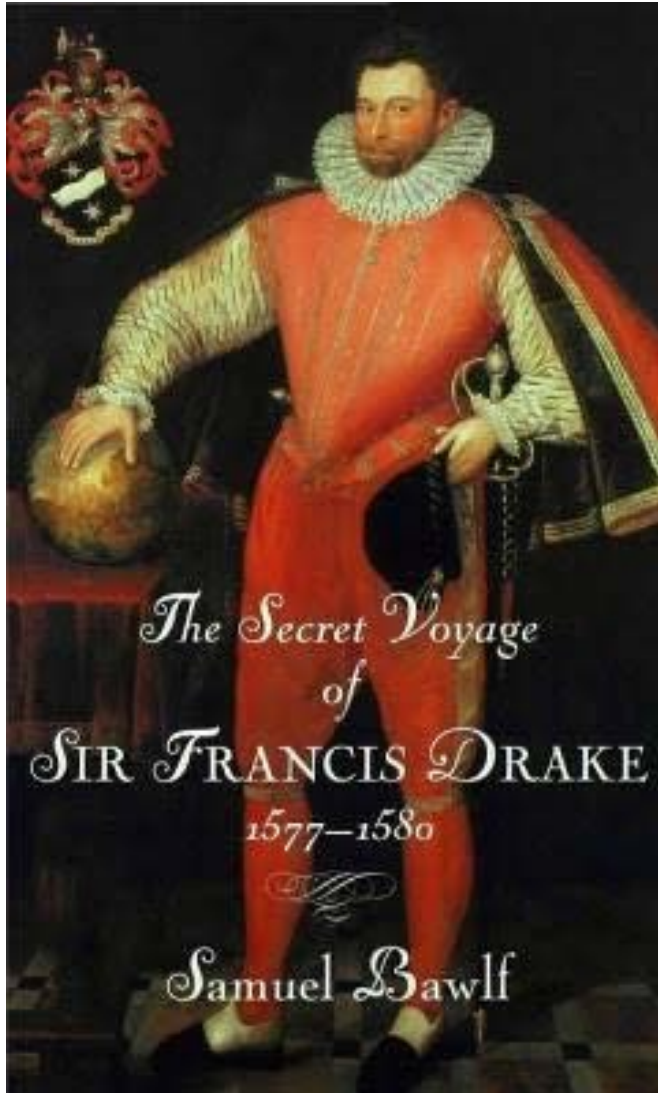
Europe Competition

- Francis Drake
 - Circumnavigates globe
 - Discovers San Francisco Bay in 1579
 - The defeat of the Spanish Armada by England is the beginning of the end for Spanish and Portuguese influence.
- England and the Netherlands then dominate the Age of Exploration.
- Cornelium Van Houtman breaks the Portuguese monopoly, dominates the East Indies, and makes a foothold in Brazil
- Two great spice trading companies emerge:
 - Dutch East India Company: monopoly in the spice islands
 - English East India Company

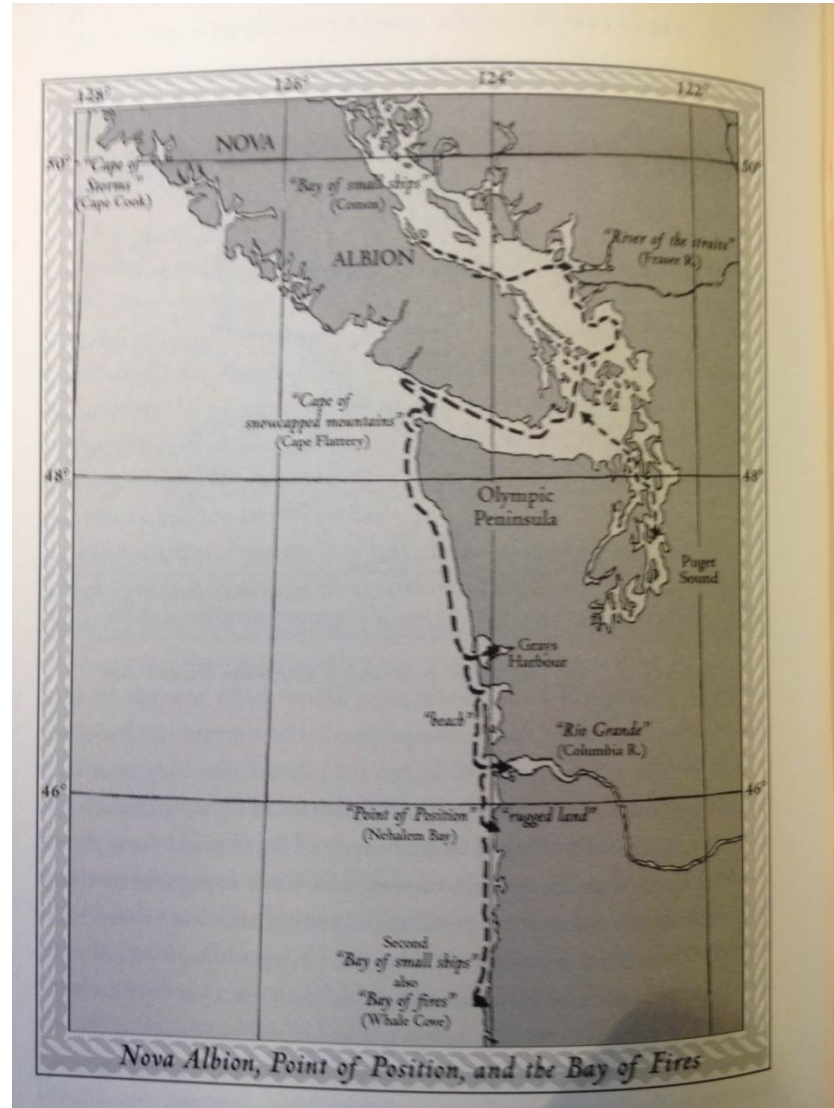
Francis Drake



Drake and New Albion



2003



Golden Hinde II in Southwark, London

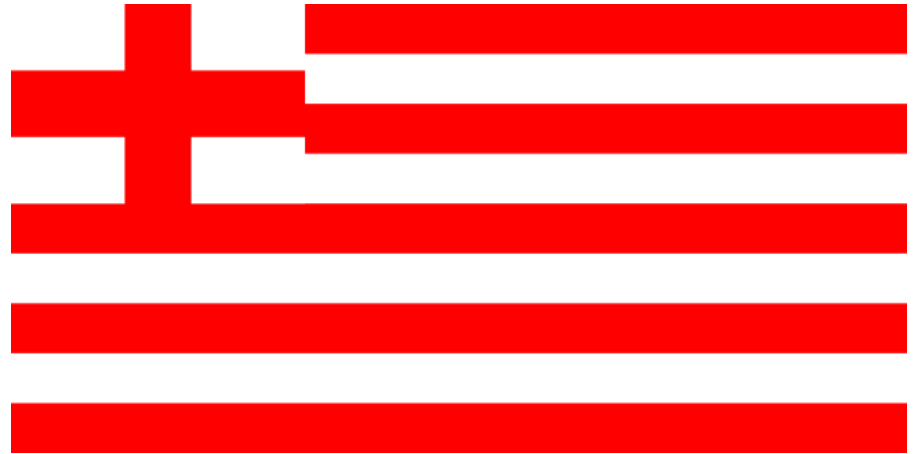


The payoff

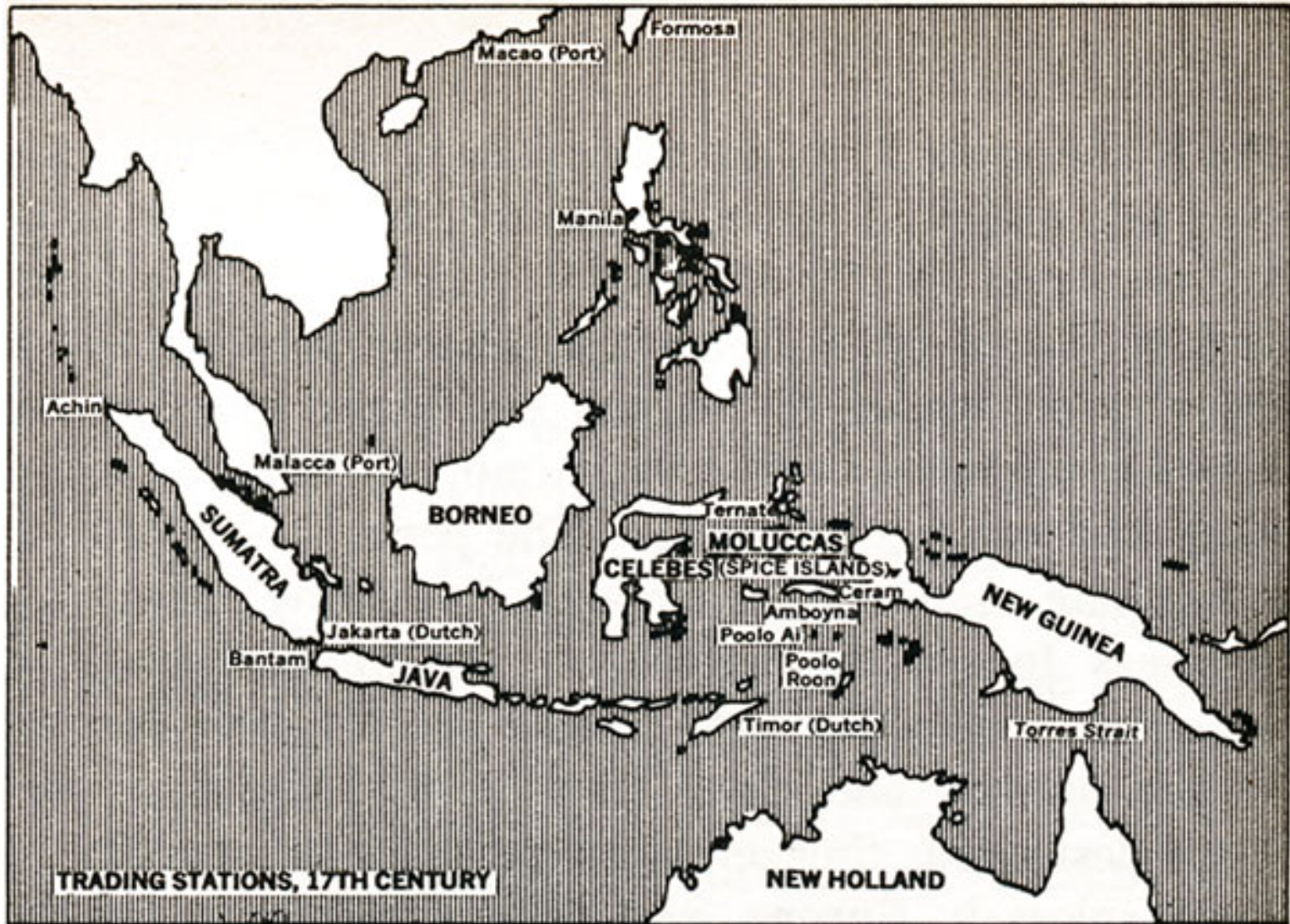


- Despite Spanish protests about his piratical conduct while in their imperial waters, Queen Elizabeth herself went aboard the *Golden Hind*, which was lying at Deptford in the Thames estuary, and personally bestowed a knighthood on him
- Her share of the treasure came to almost £160,000 [...] enough to pay off her entire foreign debt and still have £40,000 left over to invest in a new trading company for the Levant. Her return and that of other investors came to £47 for every £1 invested, or a total return of 4,700%.

Commerce as PreColonialism



East India Company founded Dec 1600
Dutch East India Company
Vereenigde Oost-Indische Compagnie
Founded 1602



Trading stations for spices in the East Indies in the 17th century.

Summary

- World wind patterns a major determinant of discovery, e.g. Kerala, Zheng He
- Age of exploration begins as a way to circumvent the Arab-dominated Spice Trade
- Columbus inadvertently discovers America
- Portuguese to Africa and India, on to Asia
- Magellan then Drake circumnavigate
- Motives
- World map starts to look modern
- After Spain and Portugal, England and Netherlands start to dominate world trade via private companies