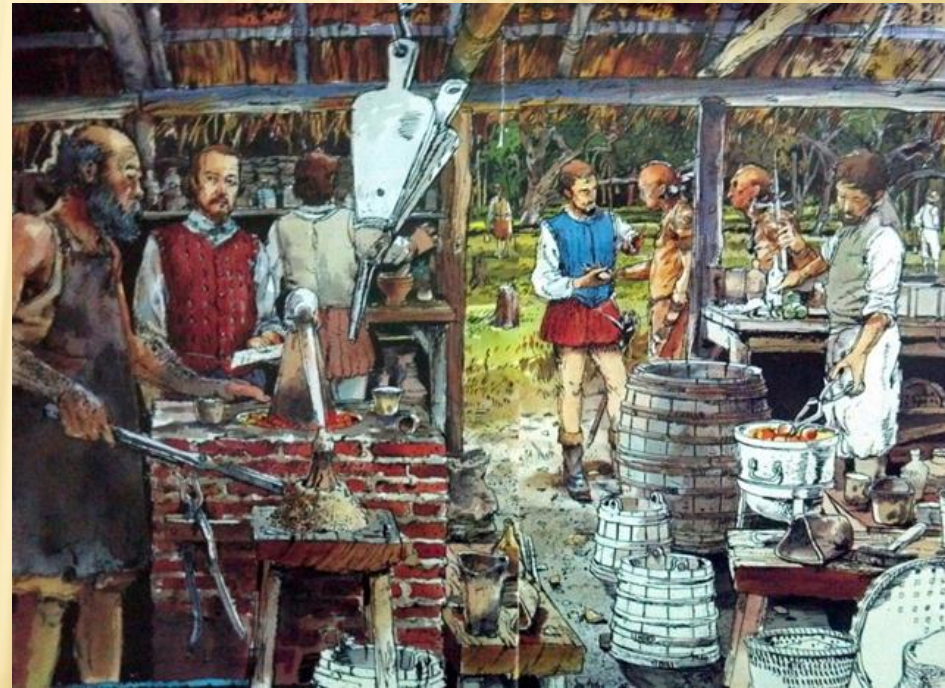


The First Tech Venture? Scientific Expertise and Financing the Roanoke Colony

Brent Lane

First Colony Foundation
Symposium

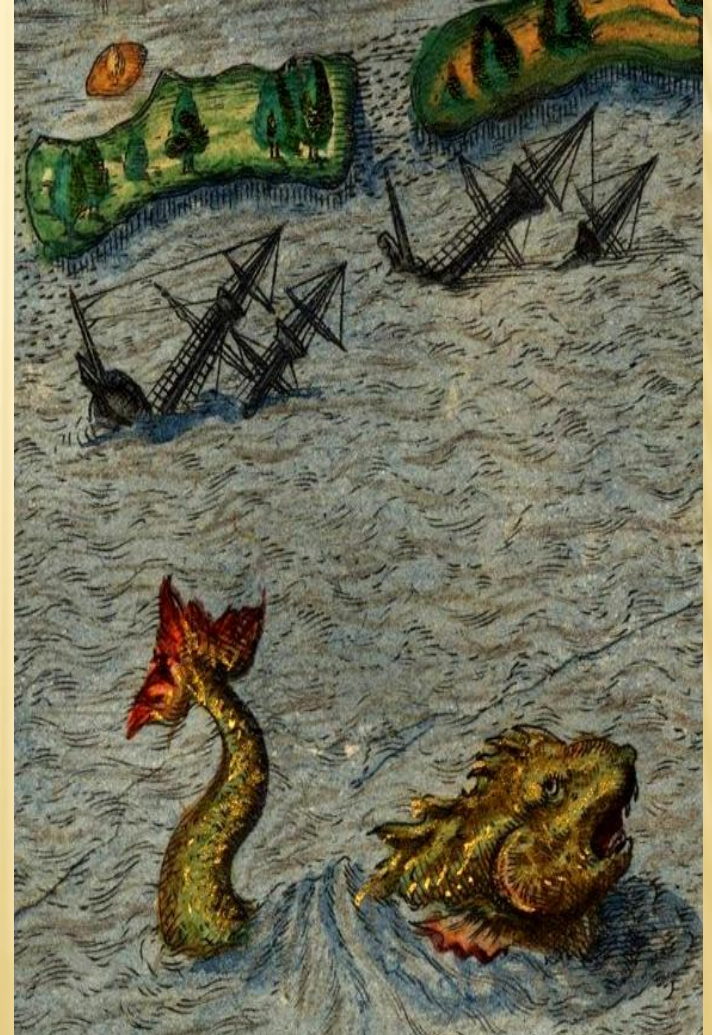
October 27 2017



BRENT LANE

University of North Carolina
Business School
Professor of Heritage
Economics

- Peat geologist
- Science policy wonk
- Tech venture capitalist

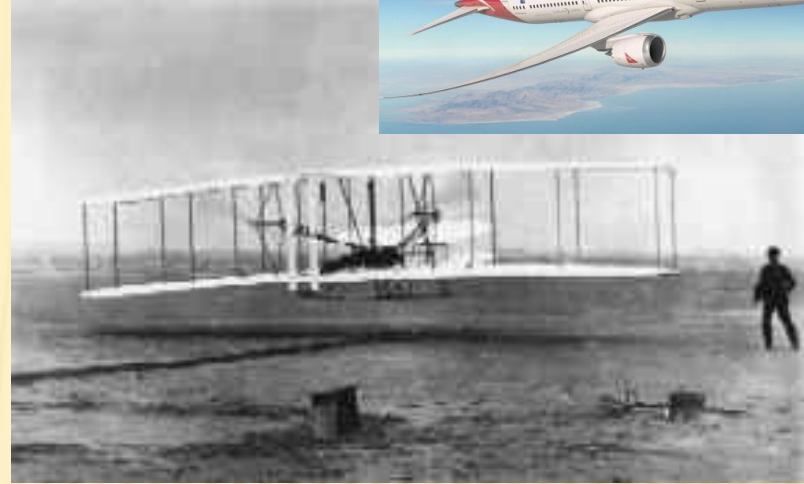




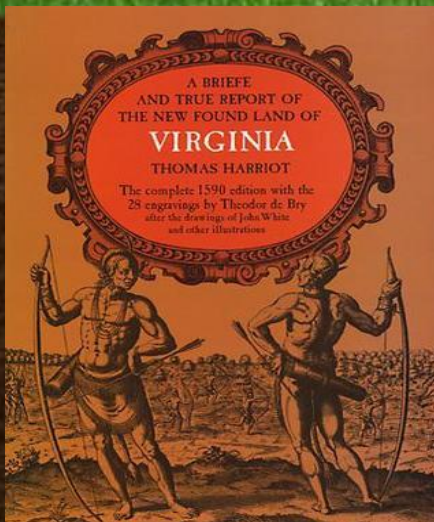
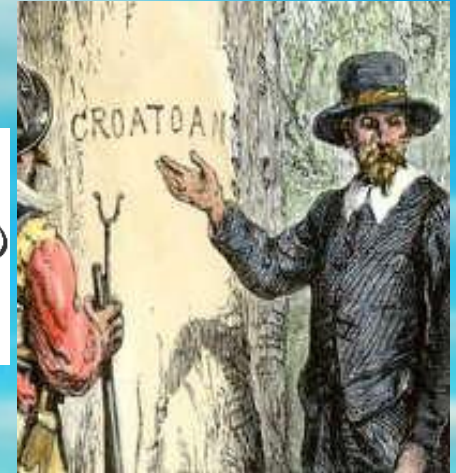
ROANOKE COLONY'S VIRGINEA PARS MAP



LAND OF BEGINNINGS



THE UNDERGROUND COLONY STORY

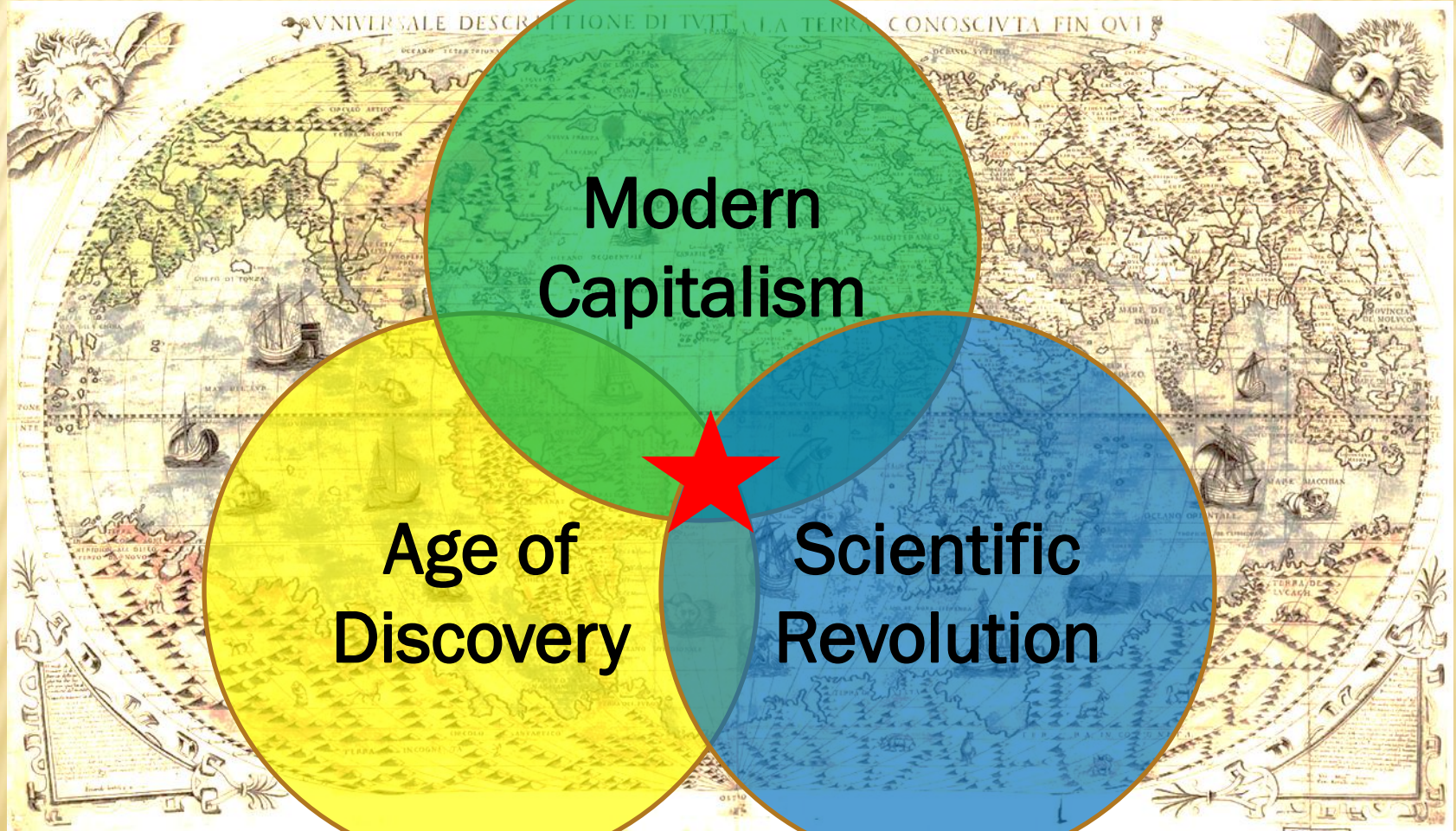




“FIRST TECH VENTURE” THESES

1. Late 16th century a transformational period in the sciences, business and global exploration
2. Underwhelming early North American colonization limited Crown support forcing greater reliance on skeptical private capital
3. Raleigh used “science” expertise to enhance credibility of Roanoke Colony business plan
4. This strategy proved a “double bladed sword”

LATE 16TH CENTURY EUROPE



**Modern
Capitalism**

**Age of
Discovery**

**Scientific
Revolution**

HIGH NEW WORLD EXPECTATIONS

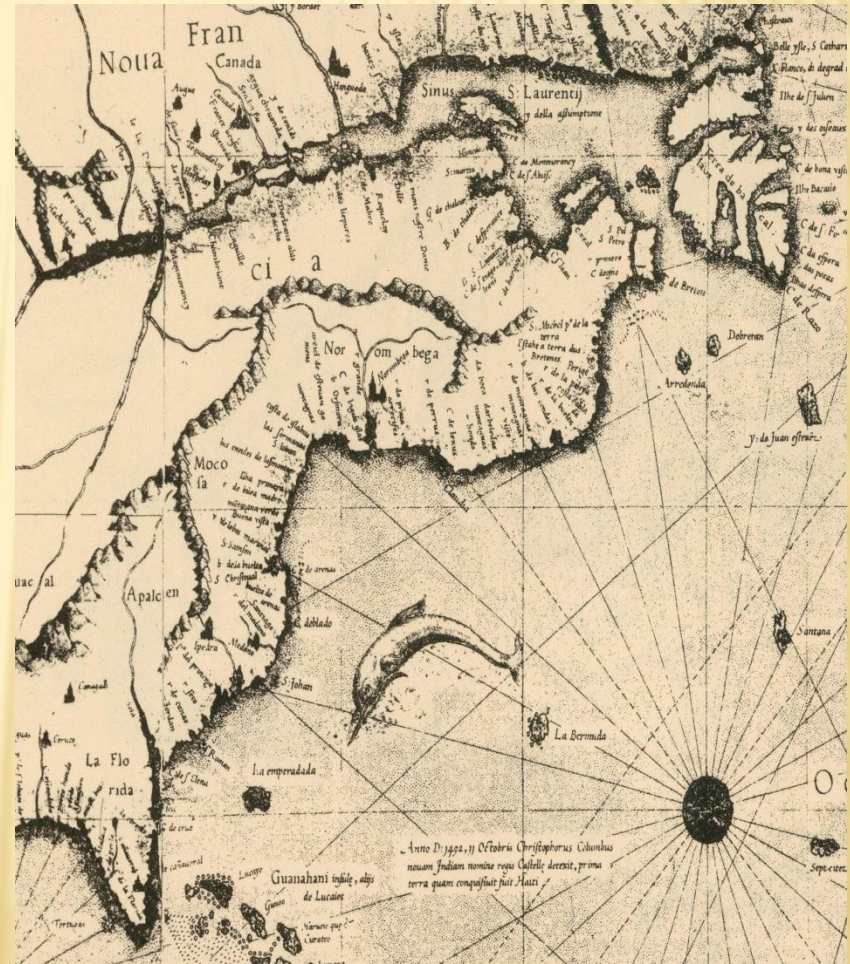
Early 16th century success of court-supported Spain and Portugal's exploration in Central and South America spurred rival interests in trade, botanicals and precious metals.



Del Tabaco, & sue grandi virtus.
Cap. I.

NORTH AMERICA SPECULATIONS

- ✘ Northwest Passage
- ✘ Markets for goods
- ✘ Precious metals and commodities
- ✘ Botanicals
- ✘ Piracy/privateering



NEW WORLD COLONY BEARS AND BULLS



NORTH AMERICA MIXED RESULTS

Early North America explorations by English and French had similar support...but a lack of financial success soon curbed their royal enthusiasms.

Maritime entrepreneurs turned to private investors.

Henry VII of England and Francis I of France



PRIVATEERING BULL MARKET

- ✘ While illegal “privateering” established as a lucrative speculative investment.
- ✘ Francis Drake’s 1577-80 circumnavigation seized Spanish prize ships.
- ✘ Drake produced a 47X return for his investors.



COLONIZATION BEAR MARKET

1542: Cartier @ Cap-Rouge (Fr)

1565: Ribault @ Fort Caroline (Fr)

1578: Frobisher @ Meta Incognita (En)

1583: Gilbert @ Norembega (En)

Bad science and information control

- ✘ Much loss of lives and capital
- ✘ Many investor lawsuits
- ✘ Weak joint stock company structure
- ✘ Pessimistic capital markets



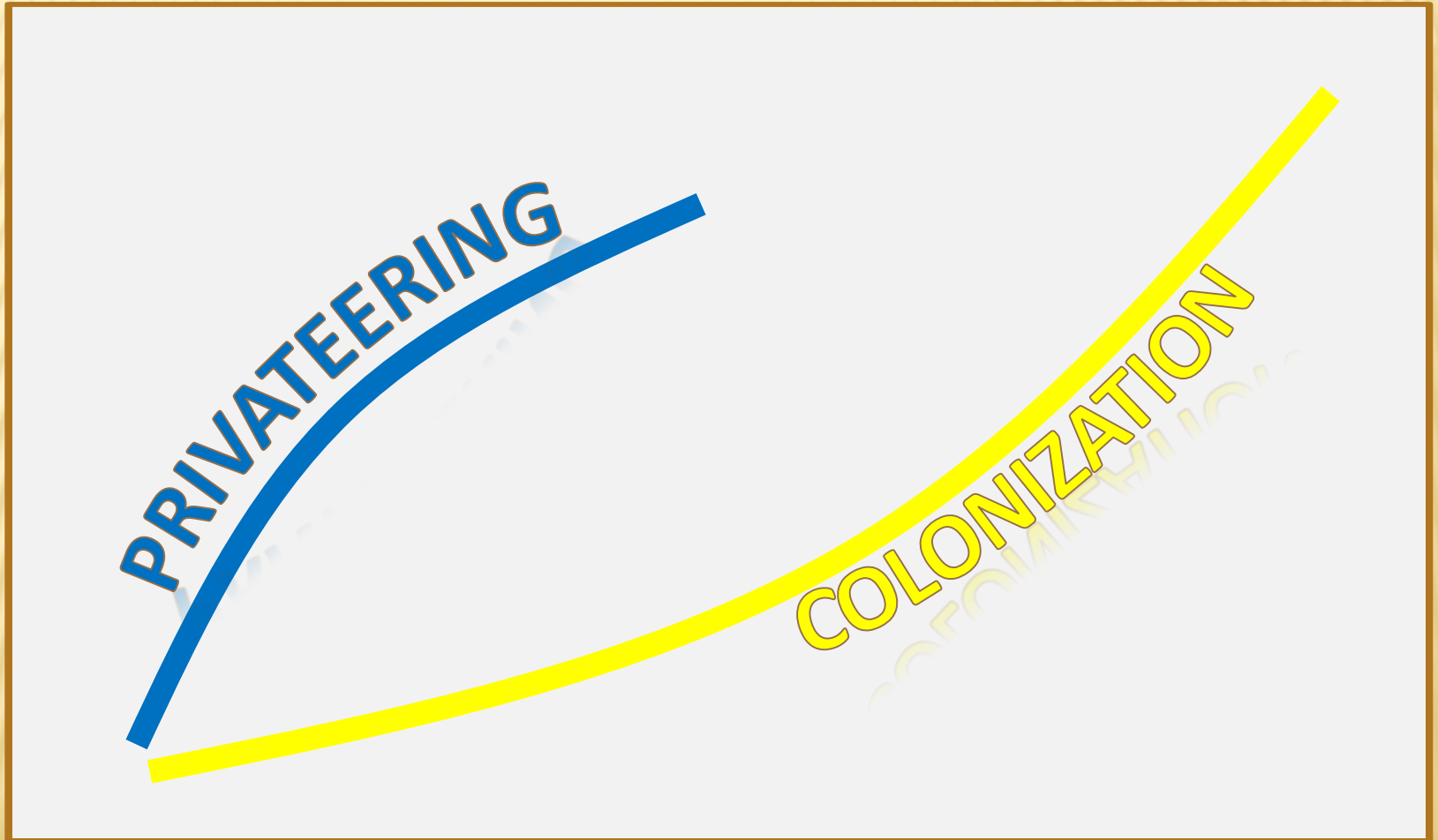
CONTRASTING RISK/REWARD CURVES

REWARD

PRIVATEERING

COLONIZATION

RISK



SIR WALTER RALEGH (c. 1552–1618)

English courtier, soldier, pirate, poet

- ✘ promoted English exploration and settlement in the New World
- ✘ Oxford educated with lifelong interest in science.
- ✘ Developed network of scientific advisors and kept a laboratory even in Tower of London.



JANUARY 1584 – RALEGH'S OPPORTUNITY



Walter Raleigh received exclusive “patent” to establish the first English colony in North America

He needed capital but faced skeptical investors with attractive market alternatives.

OCTOBER 1584 – RALEGH'S DILEMMA



Self-financed
£2,000 for a 1584
reconnaissance
mission.

On its return he
needed to quickly
raise £10,000 to
proceed.

PROSPECTIVE INVESTORS

Queen, Privy Council, Gentry

- ✘ Strategic investors who sought financial and long-term political returns



Merchant Adventurers

- ✘ “Merchant capitalists” traders motivated by familiar, short term results



DECEMBER 1584 – RALEGH'S SOLUTION



1. North West Passage
2. Markets for English goods
3. Valuable commodities
4. Basis and base for privateering

ATTENUATE RISK/ACCENTUATE REWARD

$$E[R] = \sum_{i=1}^n R_i P_i$$

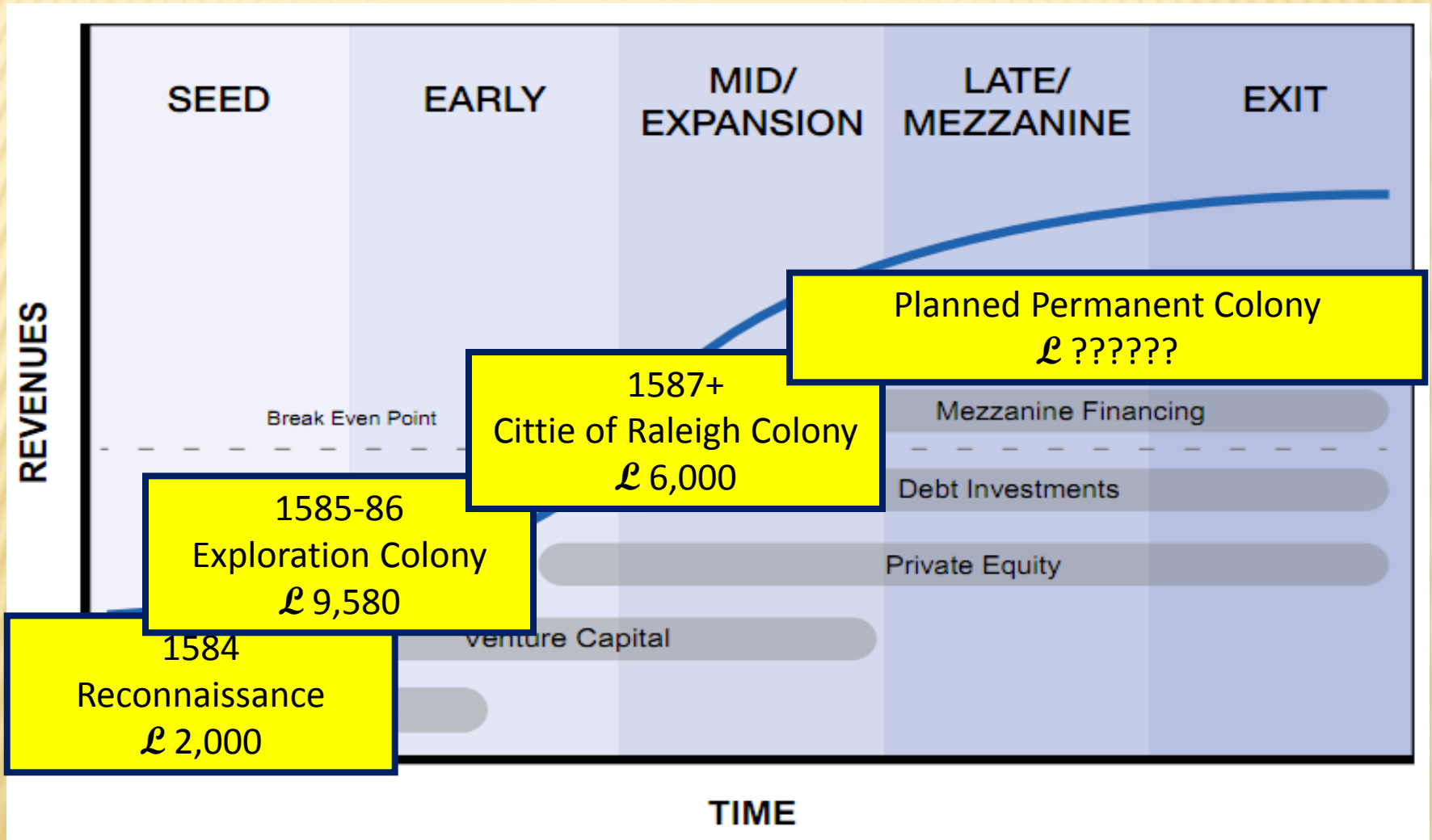
R_i is the return in scenario i ;
 P_i is the probability for the return R_i in scenario i ; and
 i counts the number of scenarios.

New manuscript and archaeology show Raleigh enhanced investors' $E[R]$ using science to increase credible ROI scenarios.

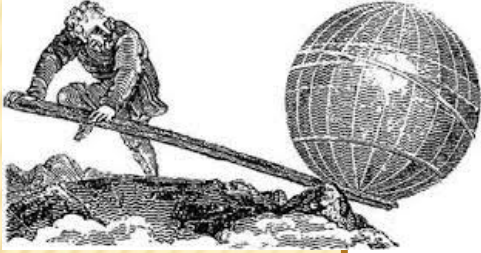
RALEIGH'S PHASED COLONIZATION PLAN

- ✘ 1584: Amadas/Barlowe reconnaissance mission to prospective colony locations
- ✘ 1585: “First Colony” year long exploration to identify site for future permanent settlement
- ✘ 1586: Resupply and soldier/settler rotation
- ✘ 1587 +: resupply and expand permanent colony as the “Cittie of Raleigh”

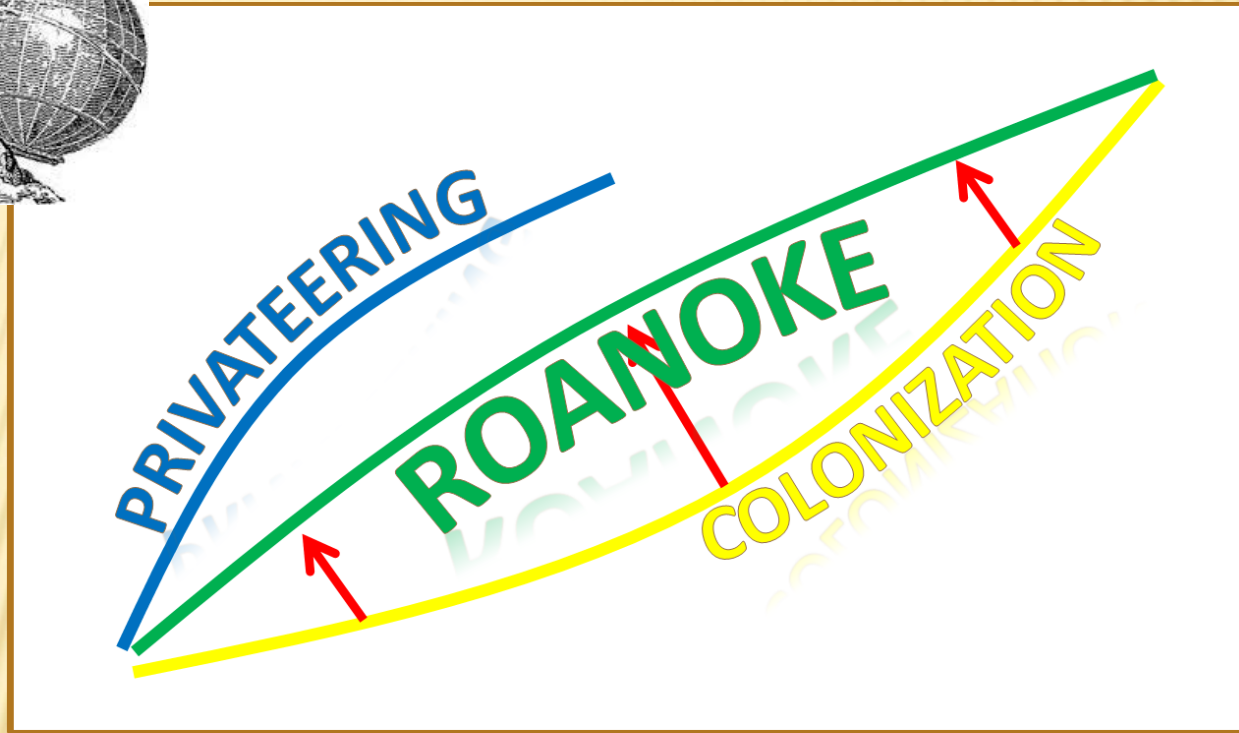
RALEIGH'S VENTURE CAPITAL STAGES



BENDING THE YIELD CURVE



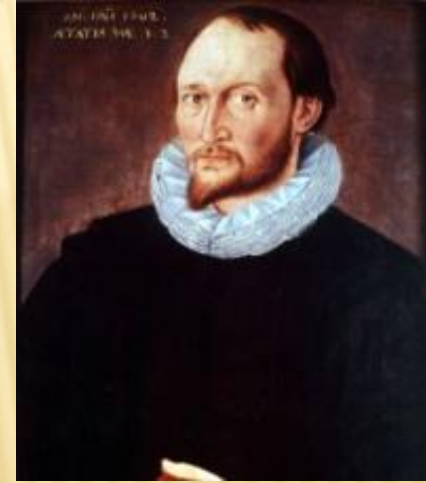
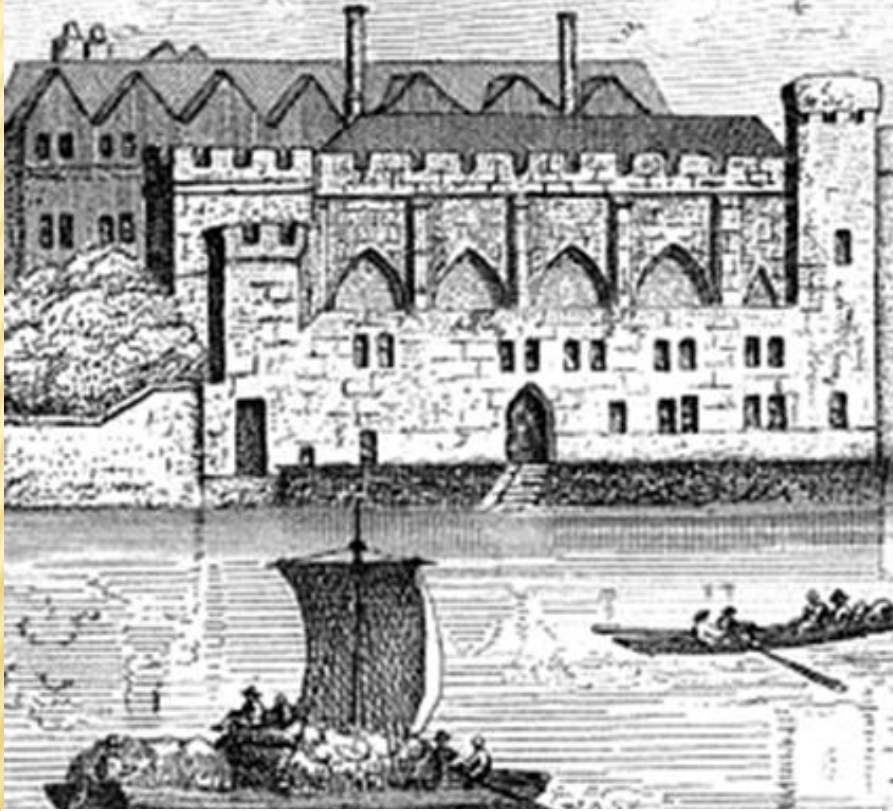
REWARD



RISK

Bend investors' Risk/Reward curve in favor of Roanoke Colony with the lever of Science.

ROANOKE'S "BLUE RIBBON SCIENCE TEAM"



- ✘ Navigation
- ✘ Metallurgy
- ✘ Botany
- ✘ Linguistics
- ✘ Cartography
- ✘ Apothecary
- ✘ Physician
- ✘ Surgeon



DR. JOHN DEE (c. 1527–1609)

- ✘ English mathematician, astronomer, astrologer, cartographer
- ✘ Advocate and adviser to English exploration
- ✘ Resident in Prague in 1583-89



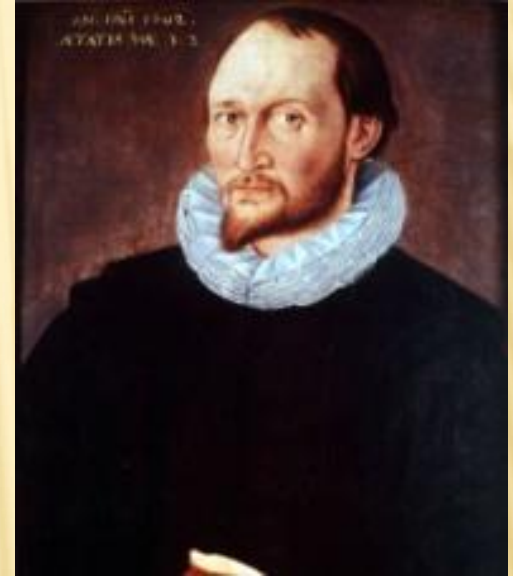
JOACHIM GANS (c. 1550–?)

- ✘ Metallurgist, native of Prague and Jew
- ✘ Advised English mining and smelting companies
- ✘ Translated Ercker's treatise on metallurgy
- ✘ Likely agent of Sir Francis Walsingham



THOMAS HARIOT (c. 1560–1621)

- ✘ English mathematician, astronomer, linguist, and experimental scientist
- ✘ Oxford graduate
- ✘ Raleigh science team leader and chronicler of outcomes
- ✘ Correspondent with Johannes Kepler in Prague



JOHN WHITE (c. 1540– c. 1603)

- ✘ Artist and cartographer
- ✘ Illustrated research findings
- ✘ Mapped areas of exploration
- ✘ Later Governor of attempted permanent colony (1587)



MANTEO AND WANCHESE

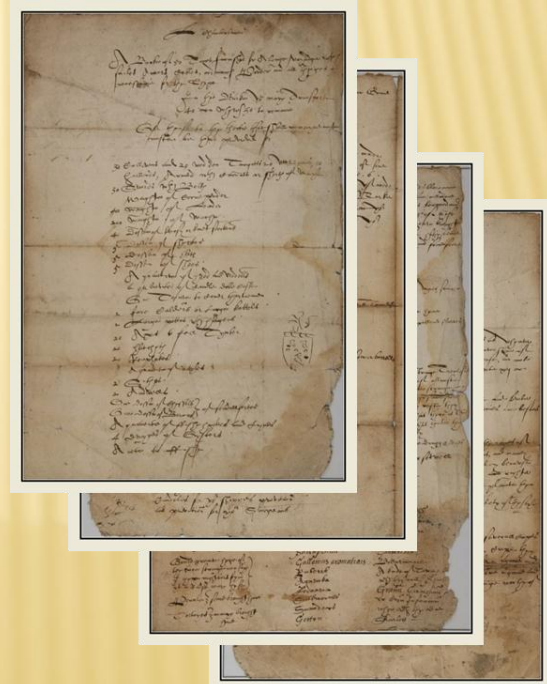
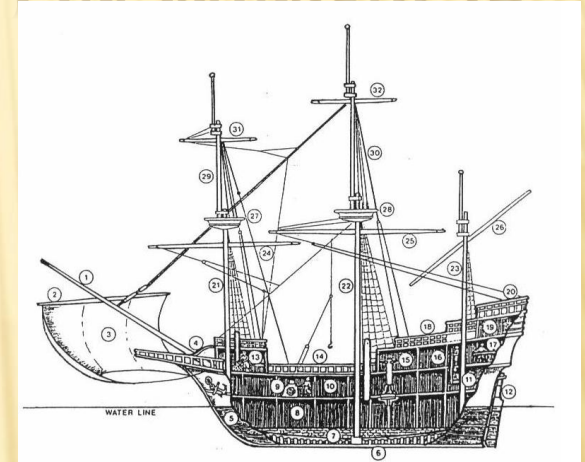
- ✘ Members of two different tribes - the Secotan and the Roanoke
- ✘ Selected by their chiefs to travel to London in 1584 to learn about the English
- ✘ Returned with the 1585 First Colony with very different perspectives



“SUCHE THINGES AS IS TO BE HAD IN WINGACIE”

Kent archive - 1585 Roanoke Colony prospectus specifying

- ✘ “A Barke of 50 Tonnes” to “Transporte 40 men whereof 30 to remaine”
- ✘ Personnel, equipment, and supplies
- ✘ “Expert” validated commercial opportunities



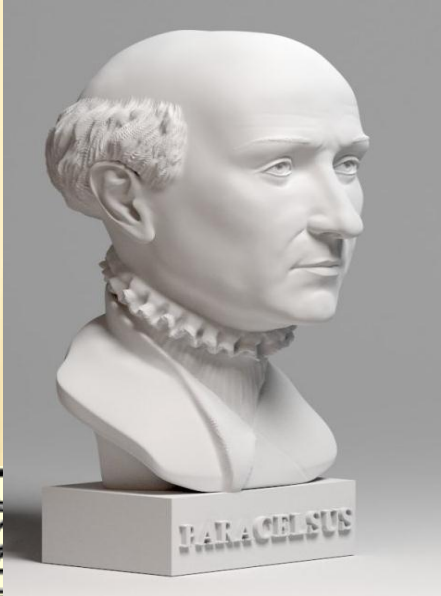
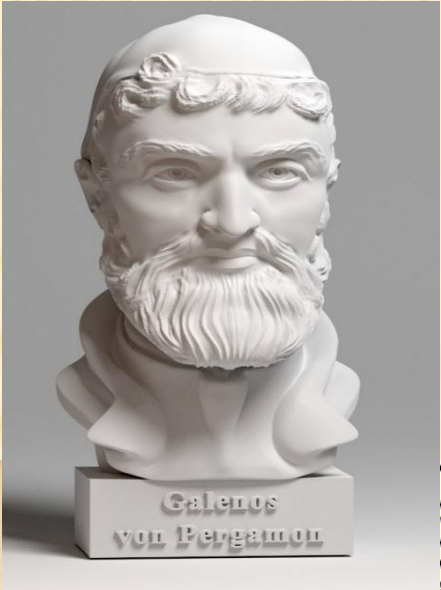
“MERCHANDABLE COMODITEIES”

“Wee have allredie by
manefold Wayes Learened
and to be in Wyngandacoia”

- ✘ Gold, copper, naval stores
- ✘ Botanicals with “effects in
Phisicke, other some in
Chaurgerie



ENGLAND'S VENEREAL ARMS RACE



“APOTHECARIE DRUGG & DYES”

- ✘ Guaiacam
- ✘ Therootte China
- ✘ Orres
- ✘ Turmanack
- ✘ Colloquintida
- ✘ Brassell
- ✘ Mastick
- ✘ Ollybaun
- ✘ Aloes Cicatrine
- ✘ Cumamnia
- ✘ Salsaprulla
- ✘ Callomus
aromatiais
- ✘ Ruberrb
- ✘ Agaricke
- ✘ Ledoaria
- ✘ Saunders
- ✘ Cotton
- ✘ Zednaria or
setwell
- ✘ Cohenile
- ✘ India blewe
- ✘ Teria Samia
- ✘ Beniamyn
- ✘ Sene leaues
- ✘ Tackamachaca
- ✘ Cocolus India
- ✘ Galinga
- ✘ Cantarides

EXETER INVESTORS' MINUTE BOOK

At this don'tt how ver containe Articles brought
m. by S^r Deputy
to us by myc^r a d^r
merch^rantable.
publy^red and
be mentured
adventure, & ca
alreade. w^{ch} m^r Andrian Gilb^t m^r a voyage into China
they will not adventure any more. n^r any such voyage
until they see that voyage ended, or some success therof.



EXETER INVESTORS - JANUARY 1585

“At this Court there were certain Articlesby Mr. Carew Raleigh touching a planned voyage to Wyngandacoia and a note of the merchantable and other commodities there found...

Whereunto the Company did answer that as they were adventurers already with Mr. Adrian Gilbert in a voyage unto China they will not adventure any more in any such voyages until they see that voyage ended or some success thereof.”

1585-86 COLONY FINANCING

By April 1585, Raleigh had raised £10,000

- ✘ Seven ships carrying approximately 600 men.
- ✘ 108 men were settled on Roanoke Island for a year.
- ✘ Research team of 15 to 20 members

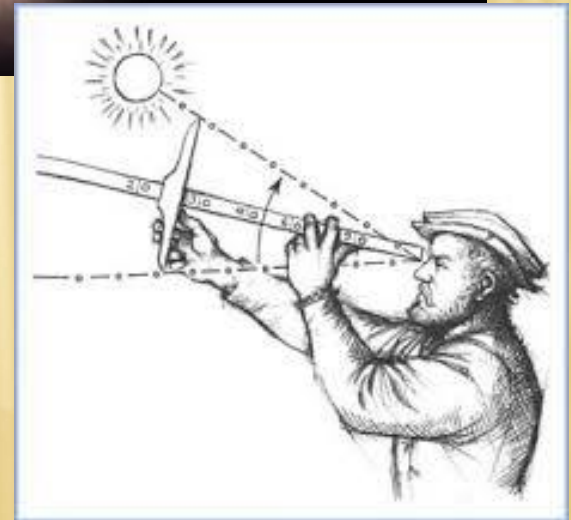


1585-86 SCIENCE PROGRAMME

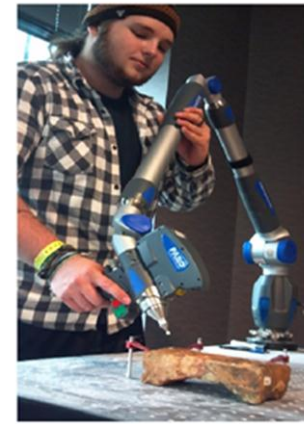
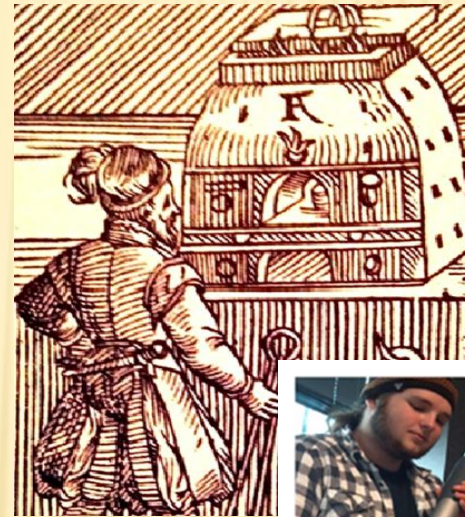
1. Celestial navigation
2. Exploration/cartography
3. Ethnography/linguistics
4. Geological/biological inventory
5. Commodities assessment
6. Site evaluation for future capital “Cittie of Raleigh”



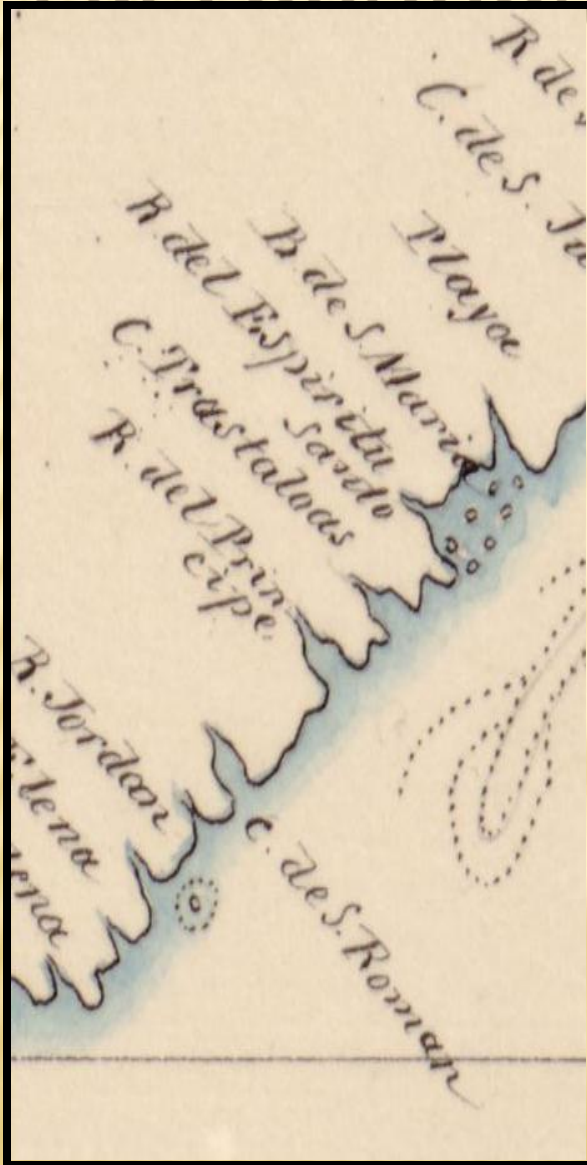
CELESTIAL NAVIGATION



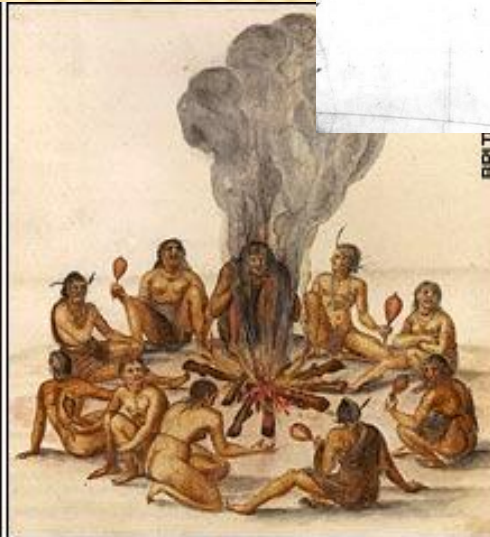
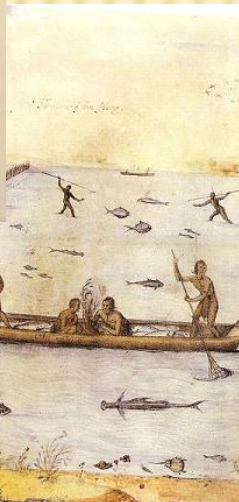
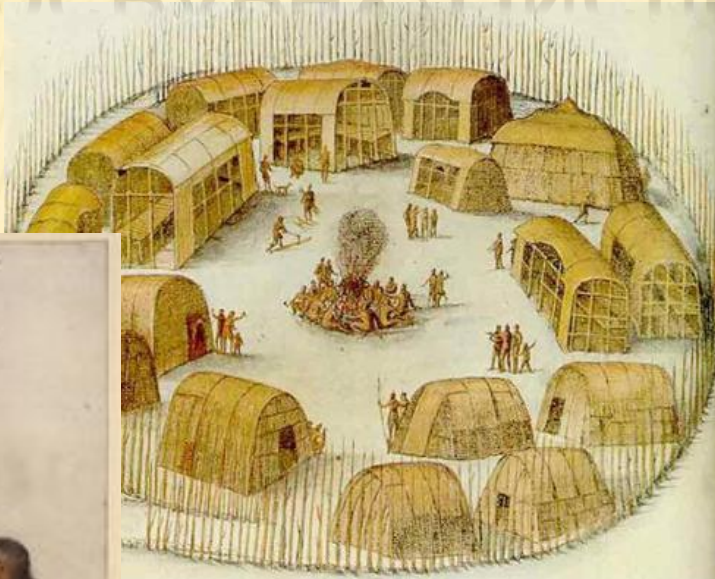
ROANOKE ISLAND "SCIENCE CENTER"



EXPLORATION/CARTOGRAPHY



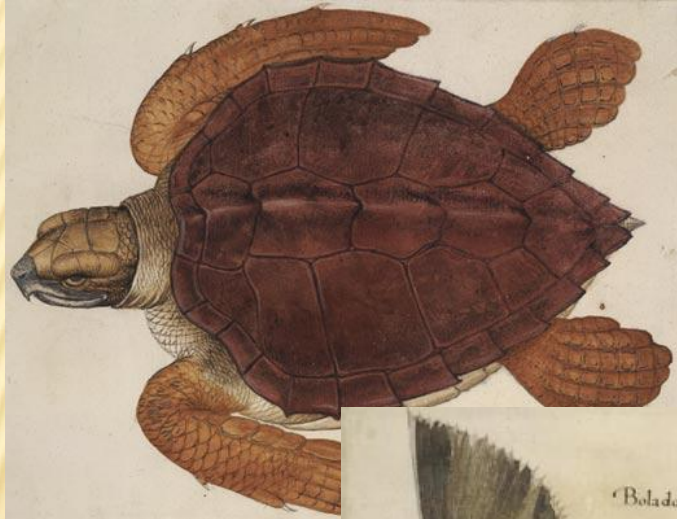
ETHNOGRAPHY/LINGUISTICS



In the full of the day...
 The first of the day...
 The second of the day...
 The third of the day...
 The fourth of the day...
 The fifth of the day...
 The sixth of the day...
 The seventh of the day...
 The eighth of the day...
 The ninth of the day...
 The tenth of the day...
 The eleventh of the day...
 The twelfth of the day...
 The thirteenth of the day...
 The fourteenth of the day...
 The fifteenth of the day...
 The sixteenth of the day...
 The seventeenth of the day...
 The eighteenth of the day...
 The nineteenth of the day...
 The twentieth of the day...
 The twenty-first of the day...
 The twenty-second of the day...
 The twenty-third of the day...
 The twenty-fourth of the day...
 The twenty-fifth of the day...
 The twenty-sixth of the day...
 The twenty-seventh of the day...
 The twenty-eighth of the day...
 The twenty-ninth of the day...
 The thirtieth of the day...
 The thirty-first of the day...

baheva 2017/1/3

BIOLOGICAL / MINERAL INVENTORY



INORGANIC CHEMISTRY

Gans and his “mineral men” searched for ores and tested copper used by natives

- ✘ Archaeologists found evidence of assaying and metallurgical testing research on Roanoke Island

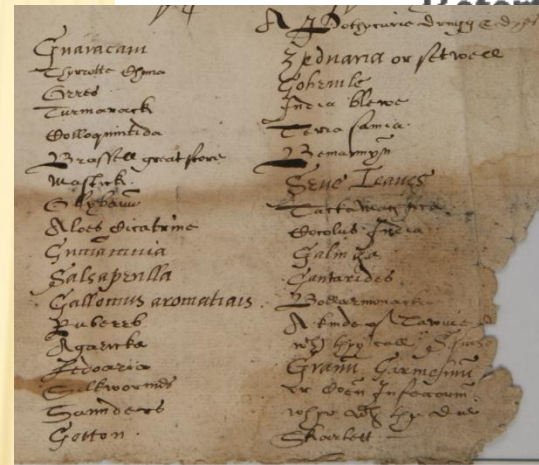
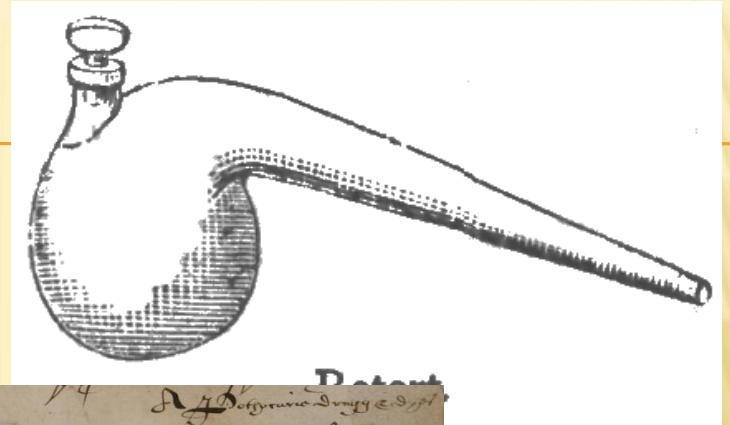


ORGANIC CHEMISTRY

Distillation apparatus
excavated at Roanoke
“Science Center”

Reports by Roanoke
apothecaries confirmed
presence of numerous
pharmacological compounds

- ✘ Raleigh maintained lucrative monopoly on imports of saffron through 1603



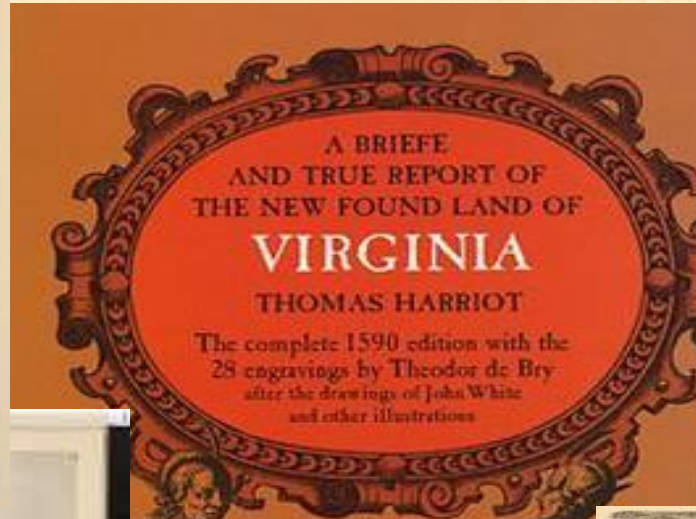
KNOWLEDGE IS POWER, BUT SECRECY IS CONTROL

Early modern “Knowledge economy”

“Scientific knowledge and economic needs in the 16th century existed in a reciprocal relationship”

- *Dr. Stephen Clucas, Birkbeck College, University of London*

BALANCING DISCLOSURE AND SECRECY



HARRIOT “BRIEF AND TRUE” REPORT

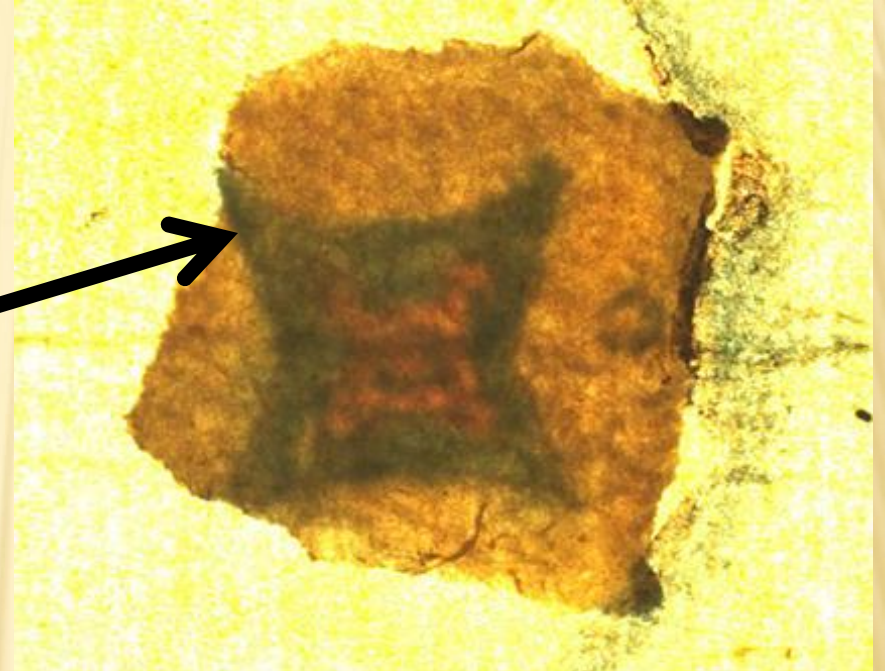
“Two more commodities of great value...I might have specified. So likewise of those commodities already set downe I might have said more, as of the particular places where they are found. But because others than welwillers might bee therewithal acquainted, not to the good of the action, I have wittingly omitted them, knowing that to those that are well disposed I have uttered sufficient”

LA VIRGINEA PARS

- ✘ East coast of North America from Chesapeake bay to Cape Lookout
- ✘ 1585-87 by John White and Thomas Harriot
- ✘ Brown ink and watercolor over graphite on paper
- ✘ 478 mm x 235 mm
- ✘ Scale: 1:790000



“CITTIE OF RALEIGH”?



**THE
BRITISH
MUSEUM**

IN CONFIDENCE

DEPARTMENT OF CONSERVATION AND SCIENTIFIC RESEARCH

Examination of patches on a map of the east coast of North America by John White
("La Virginea Pars"; 1906,0509.1.3)

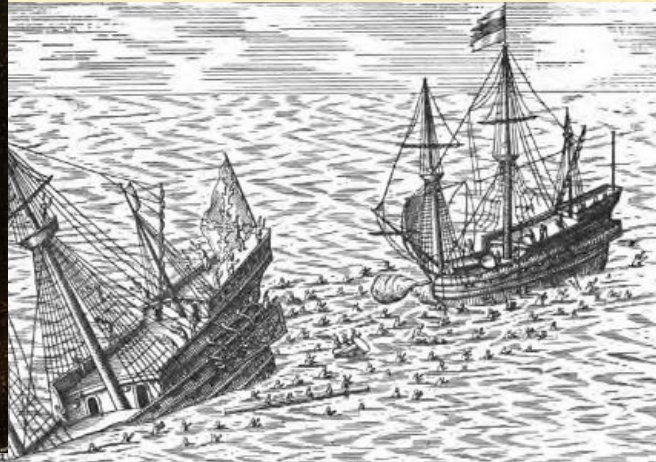
CSR ANALYTICAL REQUEST NO. AR2012-21

THE INFORMATION “UNRAVELING” OF ROANOKE

- ✘ Externally, alienated elite colonists spread disparaging rumors in England
- ✘ Internally, credible findings underwhelmed investors
- ✘ 1587 - minimal “permanent” colony to maintain patent
- ✘ Thin capitalization made vulnerable to externalities

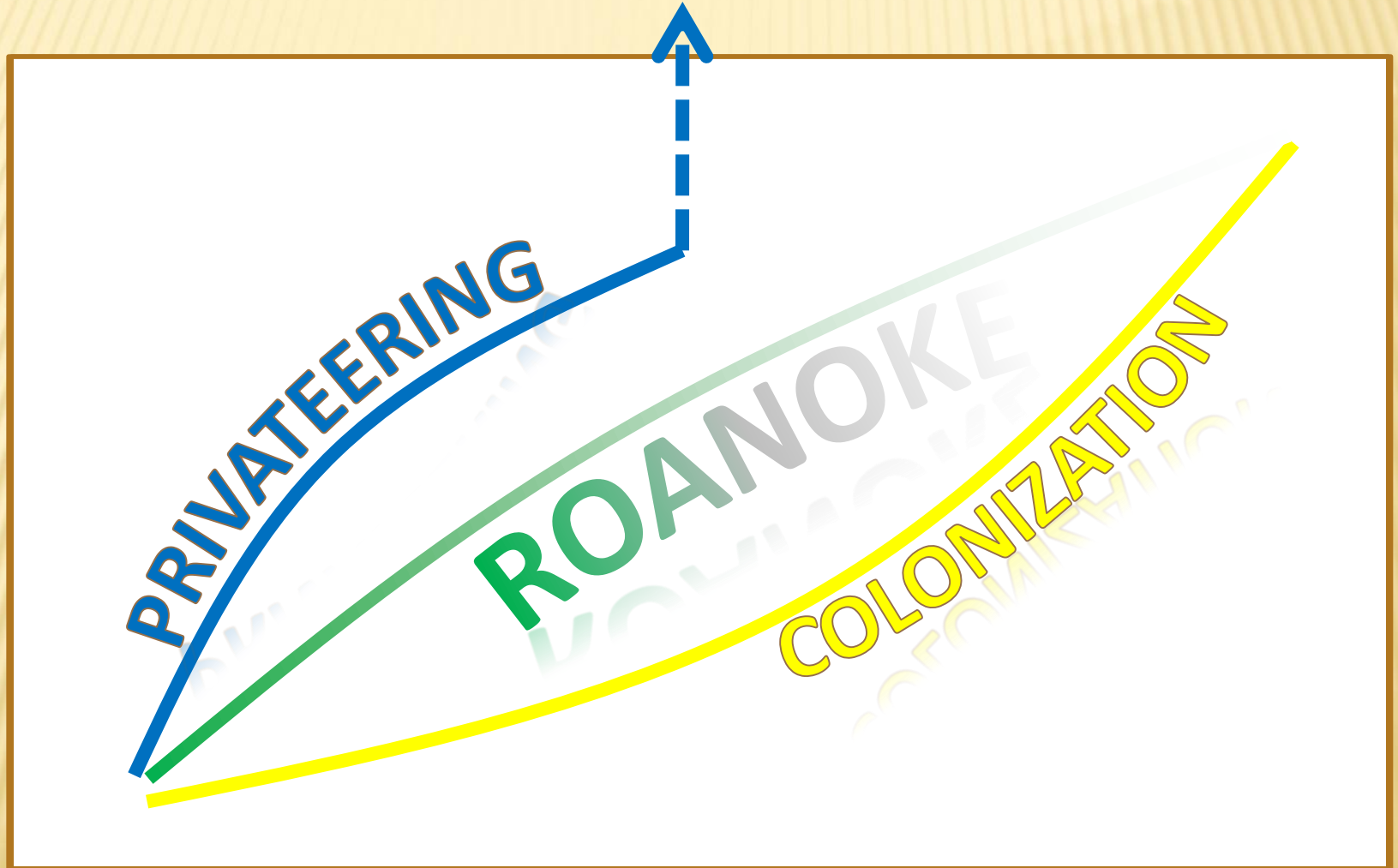


1585 - OPEN WAR, PRIVATEERING BOOM



PRIVATEERING DIVERTED CAPITAL

REWARD



RISK

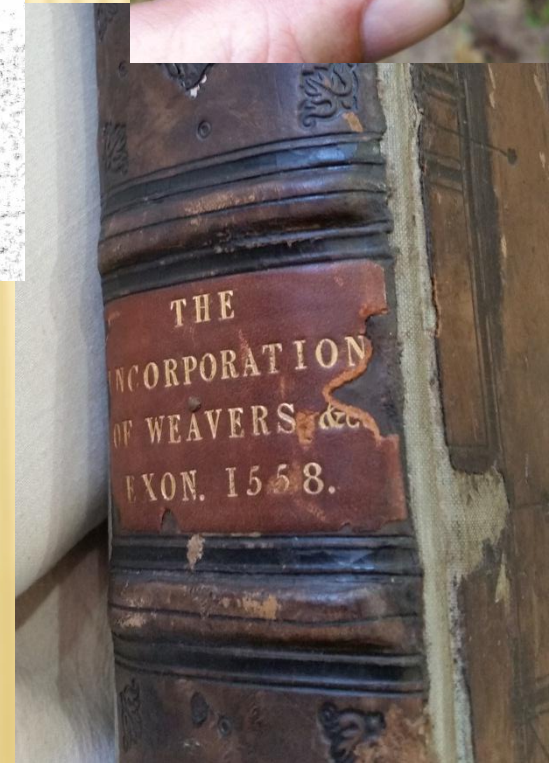
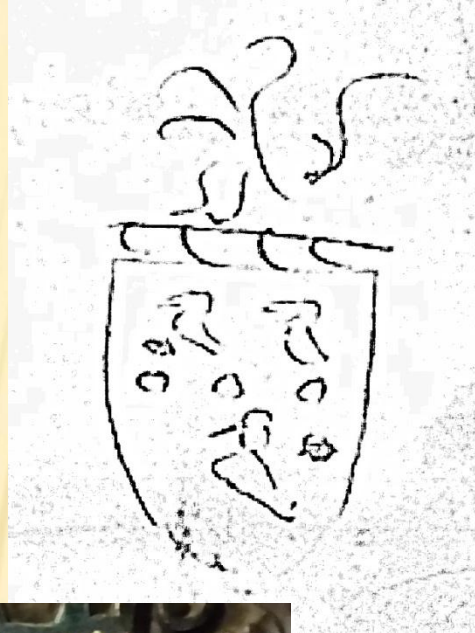
SPANISH THREAT DIVERTED ATTENTION



1590 SECRET COLONY.... LOST COLONY



NEW PERSPECTIVES, NEW INFO, RICHER STORY



The First Tech Venture? Scientific Expertise and Financing the Roanoke Colony

Brent Lane

First Colony Foundation
Symposium

October 27 2017

