

Off the Edge of the Map

Who was the Greatest Explorer of All?

With
Rear Admiral (Retired) Simon Hardern

The World As Europeans Understood It Around 1510



What Makes A Great Explorer?

Four Tests Every Explorer Must Pass



Navigation

Knowing where you are when nobody has been there before



Leadership

Holding a crew together for months or years from home



Risk

Judging when to press on and when to turn back



Discovery

Coming home with something the world did not know

Each of the explorers will be judged objectively against these four tests ...
though the ultimate decision could be viewed as subjective



The Usual Suspects

Four Famous Names - And Why They Are Not In My Five

The Usual Suspects

The Man Who Never Knew Where He Was

Christopher Columbus - 1492 to 1504

- A Genoese navigator sailing for Spain with three small ships - Santa María, Pinta and Niña

- Sighted land in the Bahamas on 12 October 1492, 36 days after leaving the Canary Islands

- Four voyages in all, yet he died in 1506 still insisting he had reached Asia

- Norse sailors had already reached North America around 500 years earlier

36 Days

From the Canary Islands to landfall

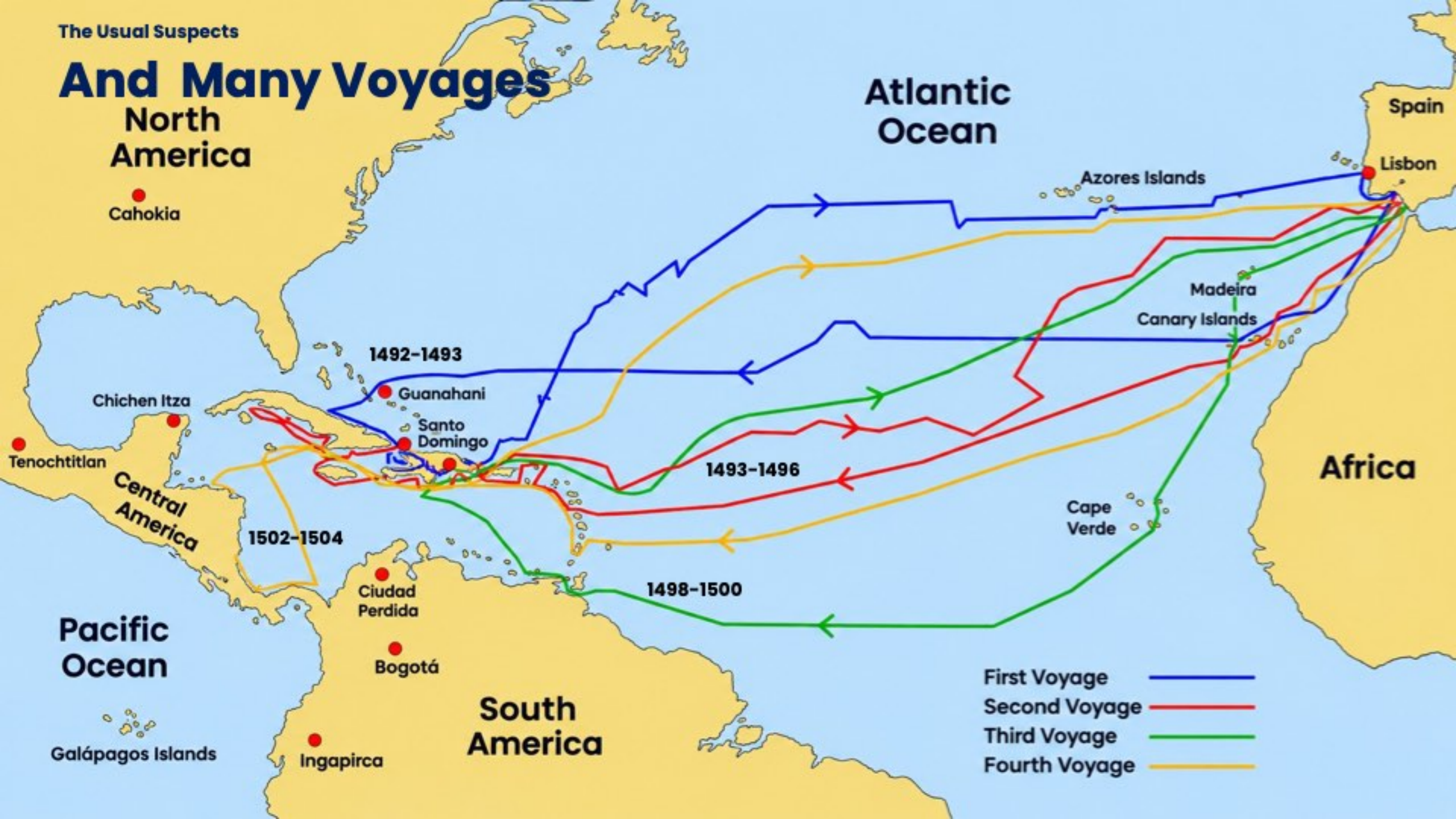
Why Not In My Five

Brave and determined, but discovered is a word that starts arguments rather than ending them

The Usual Suspects

A Man of Many Faces




The Usual Suspects
And Many Voyages
North America
Cahokia
Atlantic Ocean
Spain
Lisbon
Azores Islands
Madeira
Canary Islands
1492-1493
Guanahani
Chichen Itza
Santo Domingo
Tenochtitlan
Central America
1493-1496
Africa
Cape Verde
1502-1504
Ciudad Perdida
1498-1500
Pacific Ocean
Bogotá
South America
Galápagos Islands
Ingapirca
First Voyage
Second Voyage
Third Voyage
Fourth Voyage

First Around the World … Well Almost

Ferdinand Magellan - 1519 to 1522

- A Portuguese captain sailing for Spain, departing in 1519 with five ships and around 270 men

- Found the strait that bears his name. He entered it on 1 November 1520 and called it himself the 'Strait of All Saints'

- Killed on Mactan in the Philippines in April 1521, with the voyage only half done

- Juan Sebastián Elcano brought the last ship, Victoria, home in September 1522

18 Men

Of around 270 came home aboard Victoria (so just about 6% survival rate

Why Not In My Five

He never finished the voyage he is famous for, and much of the credit arguably belongs to Elcano

First Around The World - Almost





The Usual Suspects

10 August
1519
Magellan sailed with five ships

6 Sep
1522
Single galleon returns with 18 survivors

27 April
1521
Magellan killed by natives

21 October
1520
Magellan's galleon entered the strait

North America
Pacific Ocean
Atlantic Ocean
Spain
Seville
Africa
Asia
Philippines
Mactan Islands
Pacific Ocean
Indian Ocean
South America
Australia



Magellan's Trip Around The World - 1519-1522



The Usual Suspects

He Did Name the Pacific Ocean



On exiting the Magellan Strait on 28 November 1520, he called it Mar Pacífico, meaning Peaceful Sea, because the waters appeared remarkably calm compared with the storms his expedition had encountered

The Usual Suspects

Hero or Pirate? Depends Who You Ask

Sir Francis Drake - 1577 to 1580

- The first captain to sail around the world and survive the journey, aboard Golden Hind (renamed from Pelican)

- Came home so laden with Spanish treasure that Elizabeth I had him knighted on his own deck in 1581

- Known to the Spanish as El Draque - The Dragon

- Helped defeat the Spanish Armada in 1588, then died at sea off Panama in 1596

1,000+ Days

Plymouth to Plymouth, 1577 to 1580

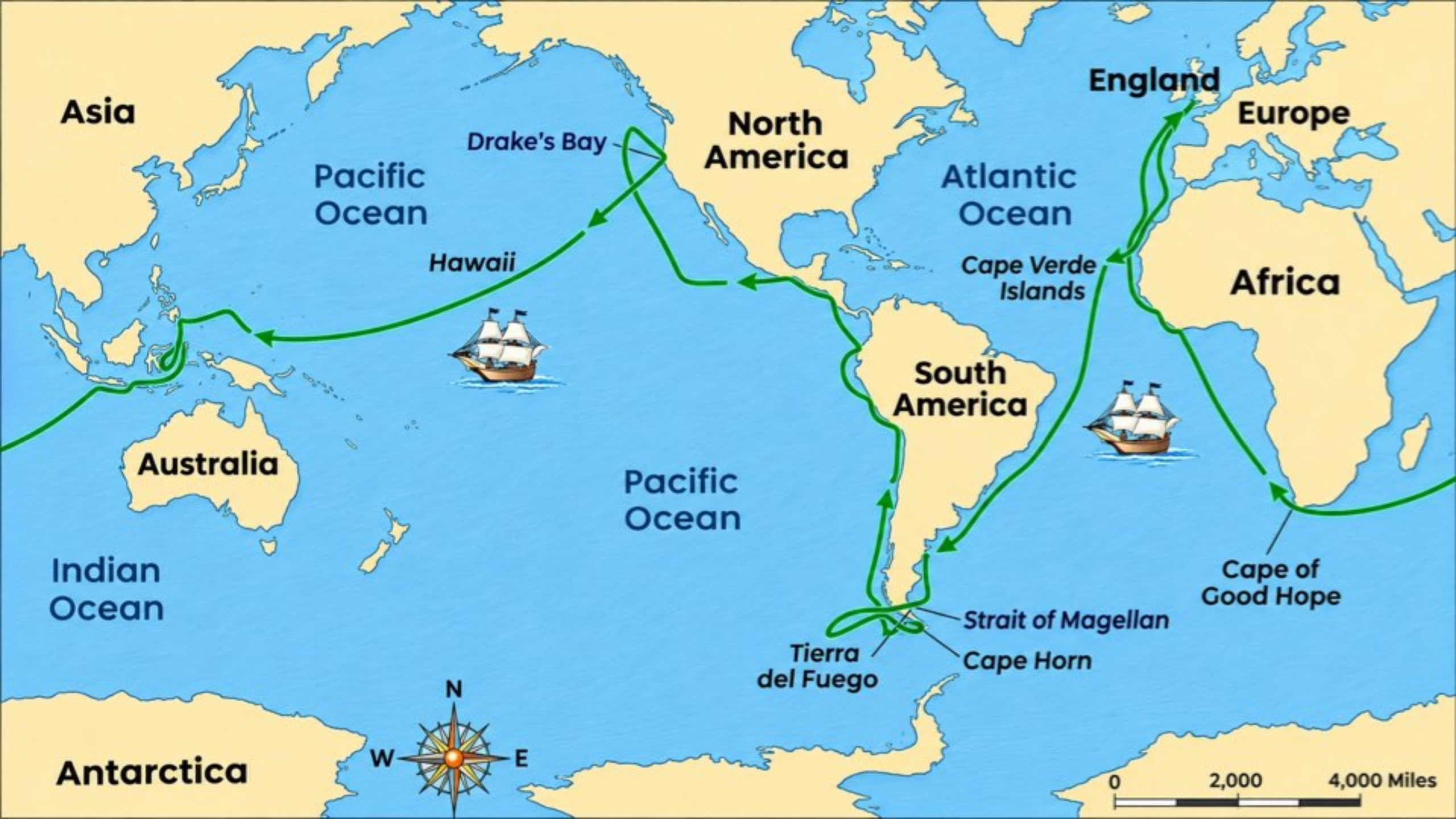
Why Not In My Five

A brilliant seaman, but his voyage was as much about Spanish treasure as discovery (though he did bring back clover and nutmeg!)

Secrets and Mysteries






Asia
Pacific Ocean
Drake's Bay
North America
Atlantic Ocean
England
Europe
Hawaii
Cape Verde Islands
Africa
South America
Australia
Pacific Ocean
Indian Ocean
Cape of Good Hope
Strait of Magellan
Tierra del Fuego
Cape Horn
Antarctica
N
W
E
0
2,000
4,000 Miles

The Drake Shake ... and Lake



The Usual Suspects

History's Greatest Failure

Ernest Shackleton - 1914 to 1916

- Set out in 1914 to make the first crossing of Antarctica, but never even set foot on the continent

- Endurance was trapped and crushed by the Weddell Sea ice, sinking in November 1915

- Sailed the open boat James Caird about 1,330 km (830 miles) through the Southern Ocean to find rescue

- The wreck was finally found on 5 March 2022 at 3,008 metres (9,869 feet)

28 of 28

Every man of the Endurance crew came home

Why Not In My Five

A giant of leadership, but his expedition discovered almost nothing new

The Usual Suspects

The Shackleton Adventure - A Hero Born of Failure





The Usual Suspects

Endurance Found



The Great Five

Five Explorers Put To The Test



From Captive Boy to Grand Admiral

Zheng He (JUNG-huh) - The Man

- Born around 1371 in Yunnan, south-west China, into a Muslim family named Ma

- Captured as a boy by the invading Ming army and taken into imperial service

- Became a trusted commander to the prince who seized the throne as the Yongle Emperor

- Renamed Zheng He and given command of the largest fleet the world had yet seen



At A Glance

Born

Around 1371, Yunnan

Sailed For

Ming China

Era

1405 To 1433

The Treasure Fleets

Seven Voyages Across the Indian Ocean

1405

First voyage sails with 62 treasure ships and around 27,800 men

1414

A giraffe reaches the imperial court, hailed as a mythical qilin

1417

The fleet reaches Malindi and Mogadishu on the coast of East Africa

1433

Zheng He dies around the end of the seventh voyage - the fleets never sail again

300 Ships

At its peak - Columbus had three

The largest treasure ships are said to have been around 120 metres (400 feet) long - historians still argue whether they were really that big




Poland & Lithuania
Golden Horde Khanate
Nurgan
Oirads Mongols
Ottoman Empire
Chagatai Khanate
Beijing
Joseon
Japan
Timur Empire
Do-Kham
U-Tsang
Ming Empire
Nanjing
Liujiagang
1417-1419
Mamluk
Beduins
Hormuz
Delhi Sultanate
Nepal
3
Raiputen
Sindh
Malwa
Gujarat
2
4
Bengal
Ahom
Ava
Arakan
Pandua
Orissa
Bahm ani
Quanzhou
Guangzhou
Medina
Jidda
Mecca
Oman
Fartak
1413-1415
Aden
5
Lasa
Pegu
1
Lan Sang
Ayutthaya
Ayutthaya
Vijayanagar
Calicut
Cambodia
Champa
1405-1407
Ethiopia
Ifat
Galle
Semudera
Malacca
Malacca
Palembang
Mogadishu
1421-1422
Malindi
1. Champa
2. Khandesh
3. Multan
4. Gondwana
5. Rasulids



The Seafarer's Verdict

Zheng He

Navigation	●●●●○
Leadership	●●●●●
Risk	●●●○○
Discovery	●●○○○

What I Admire

Running a fleet of up to 300 ships and nearly 28,000 people across an ocean - a feat of logistics no navy matched for centuries

What I Would Question

He sailed well-known trade routes with local pilots - a magnificent voyage, but not truly into the unknown given travelling known to Arab, Indian and Malay traders

The Hard Man From Sines

Vasco Da Gama - The Man

- Born around 1460 in Sines (SEE-nesh), a small fishing port on Portugal's Atlantic coast

- A minor nobleman and soldier with a reputation for toughness and a fierce temper

- Chosen by King Manuel I to finish what Bartolomeu Dias began - a sea route to India

- Rose to become Viceroy of Portuguese India and died in Cochin (Kochi) in 1524



At A Glance

Born

Around 1460, Sines

Sailed For

Portugal

Era

1497 To 1524

The Long Way Round To India

Lisbon To Calicut, 1497 To 1499

July 1497

Four ships and around 170 men leave Lisbon

Nov 1497

Rounds the Cape of Good Hope after a vast loop through the South Atlantic

May 1498

Reaches Calicut (Kozhikode) guided by a local pilot from Malindi

1499

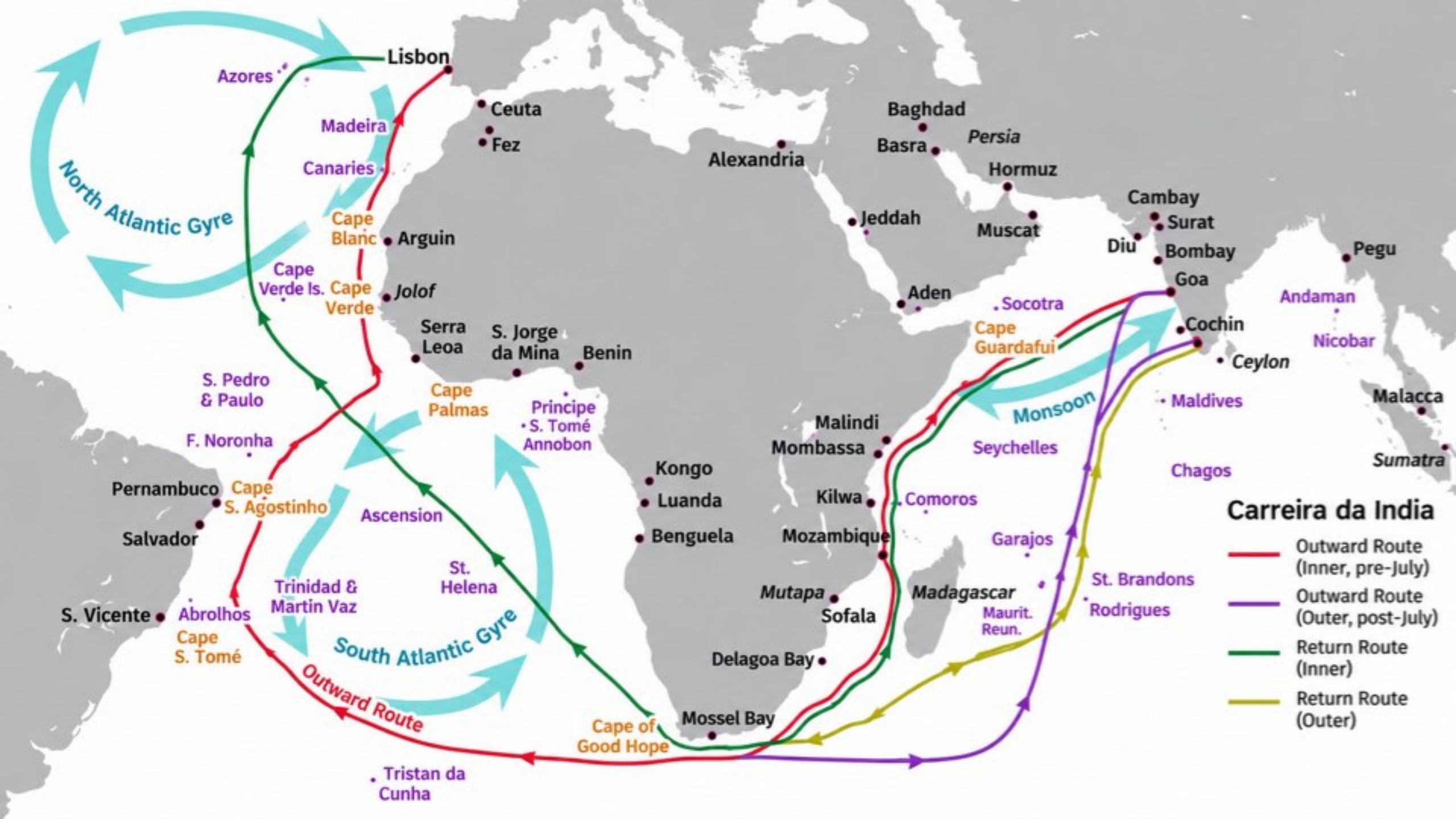
Returns home with only around 55 men alive, many lost to scurvy

93 Days

Roughly, out of sight of land

Columbus was out of sight of land for 36 days - da Gama for around three months. His cargo of pepper and spices paid for the whole voyage many times over




Lisbon
Azores
Ceuta
Fez
Madeira
Canaries
North Atlantic Gyre
Cape Blanc
Arguin
Cape Verde Is.
Cape Verde
Jolof
Serra Leoa
S. Jorge da Mina
Benin
S. Pedro & Paulo
Cape Palmas
Principe
S. Tomé
Annobon
F. Noronha
Pernambuco
Cape S. Agostinho
Salvador
Ascension
Trinidad & Martin Vaz
St. Helena
S. Vicente
Abrolhos
Cape S. Tomé
South Atlantic Gyre
Outward Route
Tristan da Cunha
Cape of Good Hope
Mossel Bay
Kongo
Luanda
Benguela
Delagoa Bay
Mutapa
Sofala
Mozambique
Madagascar
Malindi
Mombassa
Kilwa
Comoros
Seychelles
Garajos
Maurit.
Reun.
St. Brandons
Rodrigues
Chagos
Maldives
Ceylon
Cochin
Cape Guardafui
Monsoon
Socotra
Aden
Goa
Bombay
Diu
Cambay
Surat
Jeddah
Muscat
Hormuz
Baghdad
Basra
Persia
Alexandria
Andaman
Nicobar
Pegu
Malacca
Sumatra
Carreira da India
Outward Route (Inner, pre-July)
Outward Route (Outer, post-July)
Return Route (Inner)
Return Route (Outer)



The Seafarer's Verdict

Vasco Da Gama

Navigation	●●●●●
Leadership	●●●○○
Risk	●●●●○
Discovery	●●●○○

What I Admire

The Volta do Mar - trusting the winds with a huge swing out into the open Atlantic, the boldest seamanship of the age

What I Would Question

Harsh with his crew and brutal ashore - his later voyages were marked by shocking violence

The Farm Boy Who Mapped the Pacific

James Cook - The Man

- Born in 1728 in Marton, Yorkshire, the son of a farm labourer

- Learned his seamanship on Whitby colliers, hauling coal down the North Sea

- Joined the Royal Navy in 1755 as an able seaman and rose on sheer ability

- Made his name charting the St Lawrence River and the coast of Newfoundland



At A Glance

Born

1728, Yorkshire

Era

1768 To 1779

Three Voyages That Filled in the Map

The Pacific, 1768 to 1779

1769

Observes the Transit of Venus at Tahiti, then charts New Zealand

1770

Maps the east coast of Australia and survives running aground on the Great Barrier Reef

1773

Makes the first recorded crossing of the Antarctic Circle

1779

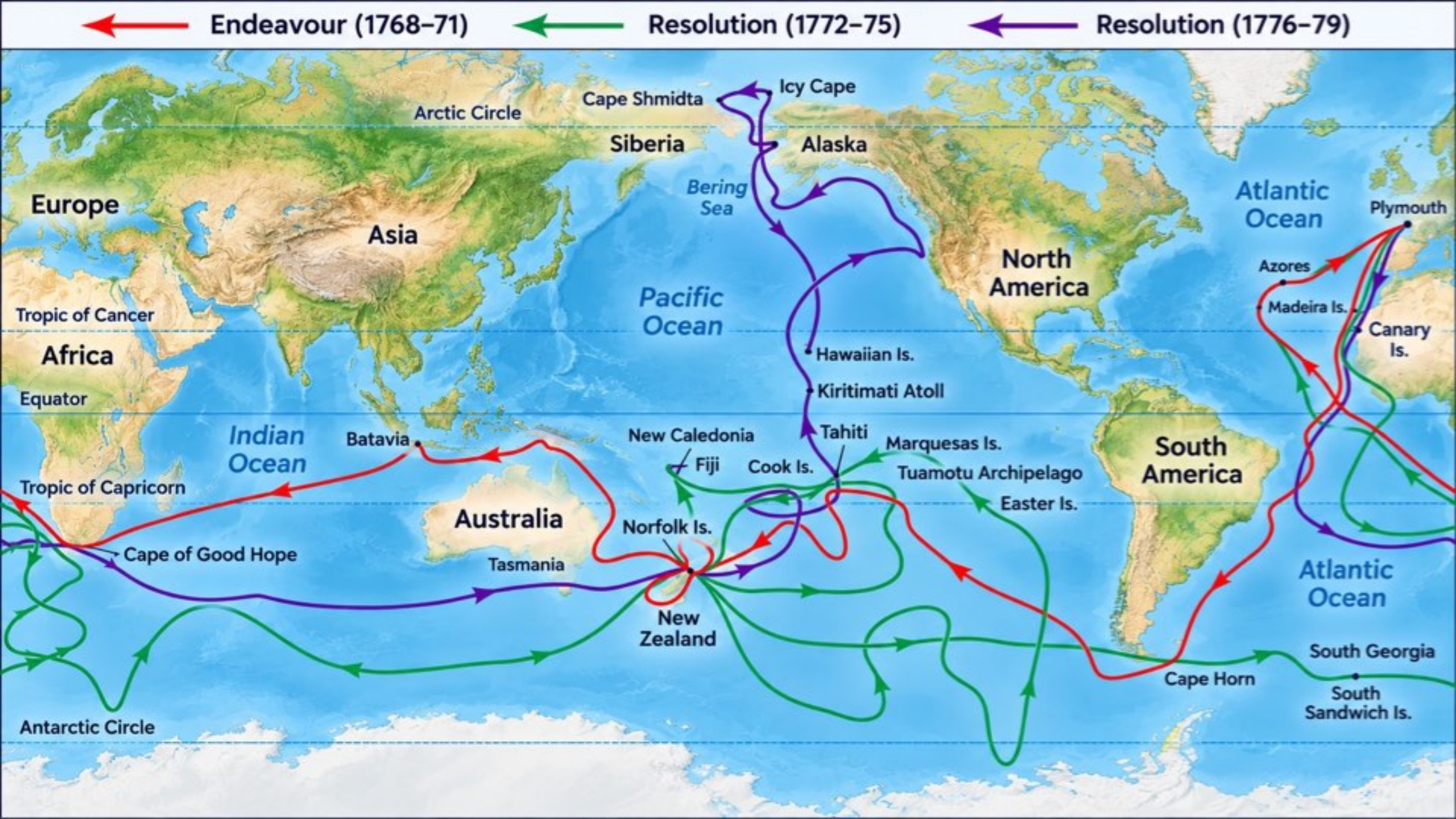
Killed at Kealakekua Bay Hawaii, on his third voyage

3 Voyages

Eleven years of exploring

Carried the K1 chronometer on his second voyage - proving at last that longitude could be found accurately at sea




Endeavour (1768–71)
Resolution (1772–75)
Resolution (1776–79)
Arctic Circle
Cape Shmidta
Icy Cape
Siberia
Alaska
Bering Sea
Europe
Asia
Atlantic Ocean
Plymouth
North America
Azores
Pacific Ocean
Madeira Is.
Canary Is.
Tropic of Cancer
Africa
Hawaiian Is.
Kiritimati Atoll
Equator
Indian Ocean
Batavia
New Caledonia
Tahiti
Marquesas Is.
Fiji
Cook Is.
Tuamotu Archipelago
South America
Tropic of Capricorn
Easter Is.
Australia
Norfolk Is.
Cape of Good Hope
Tasmania
Atlantic Ocean
New Zealand
South Georgia
Cape Horn
South Sandwich Is.
Antarctic Circle


HMS ENDEAVOUR


HMS RESOLUTION


'The danger of navigating these unknown and icy seas is so great that I can be bold to say no man will ever venture farther'
Captain James Cook, 1775

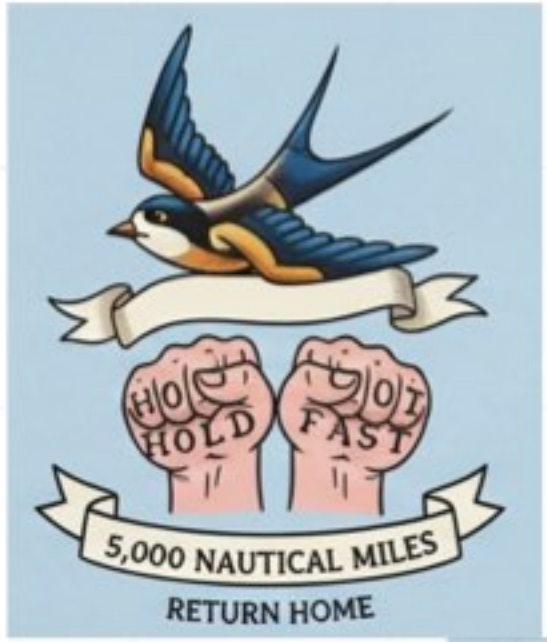


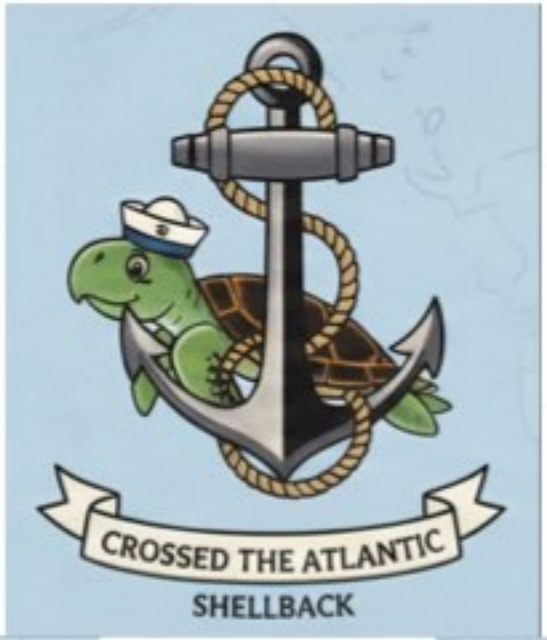


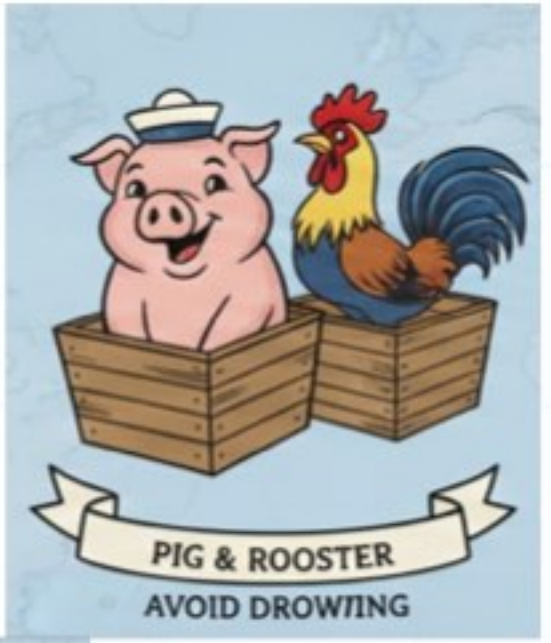
Origins - The history of naval tattoos is a blend of practical necessity, deep-seated superstition and the simple human desire for storytelling. While tattoos existed in various cultures for millennia, the modern Western tradition was essentially born at sea in the 18th century

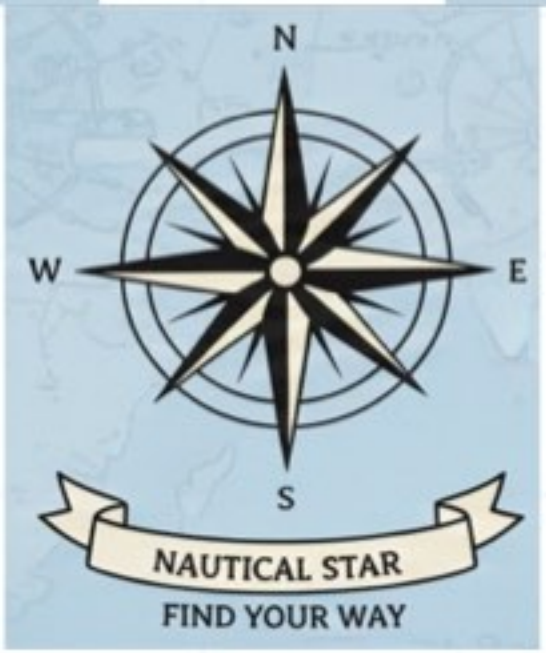
The Etymology - Capt James Cook's crew in 1769 observed the Polynesian art of tatau (meaning 'to strike' or 'mark'). They brought the word back to England, where it became tattoo

The Souvenir - Sailors, particularly those in the Royal Navy, began getting tattooed as a permanent souvenir of their travels. Because space on a warship was limited, a tattoo was the ultimate portable memento. Think physical photo!


HOLD
FAST
5,000 NAUTICAL MILES
RETURN HOME


CROSSED THE ATLANTIC
SHELLBACK


PIG & ROOSTER
AVOID DROWNING


N
W
E
S
NAUTICAL STAR
FIND YOUR WAY


HOLD FAST
GRIP RIGINE

The Seafarer's Verdict

James Cook

Navigation	●●●●●
Leadership	●●●●●
Risk	●●●●○
Discovery	●●●●●

What I Admire

Charts so accurate some were still in use well into the 20th century, and a crew kept healthy through diet and cleanliness

What I Would Question

His encounters with Pacific peoples were often tense - and a final confrontation in Hawaii cost him his life

The Navigator Europe Forgot

Tupaia (too-PIE-ah) - The Man

- Born around 1725 on Raiatea, the sacred heart of Polynesian navigation

- Trained as a priest and navigator, holding generations of ocean knowledge in his memory

- Fled to Tahiti after warriors from neighbouring Bora Bora overran his home island

- An adviser to Tahitian chiefs when the Endeavour arrived in 1769

At A Glance

Born

Around 1725, Raiatea

Sailed With

Endeavour

Era

1769 To 1770

The Man Who Guided Cook

Aboard Endeavour, 1769 To 1770

July 1769

Joins Endeavour at Tahiti and pilots her through the Society Islands

1769

Draws a chart of 74 Pacific islands entirely from memory

Oct 1769

Acts as interpreter with the Māori in New Zealand, whose language was close to his own

Dec 1770

Dies of illness in Batavia (modern Jakarta) on the voyage home

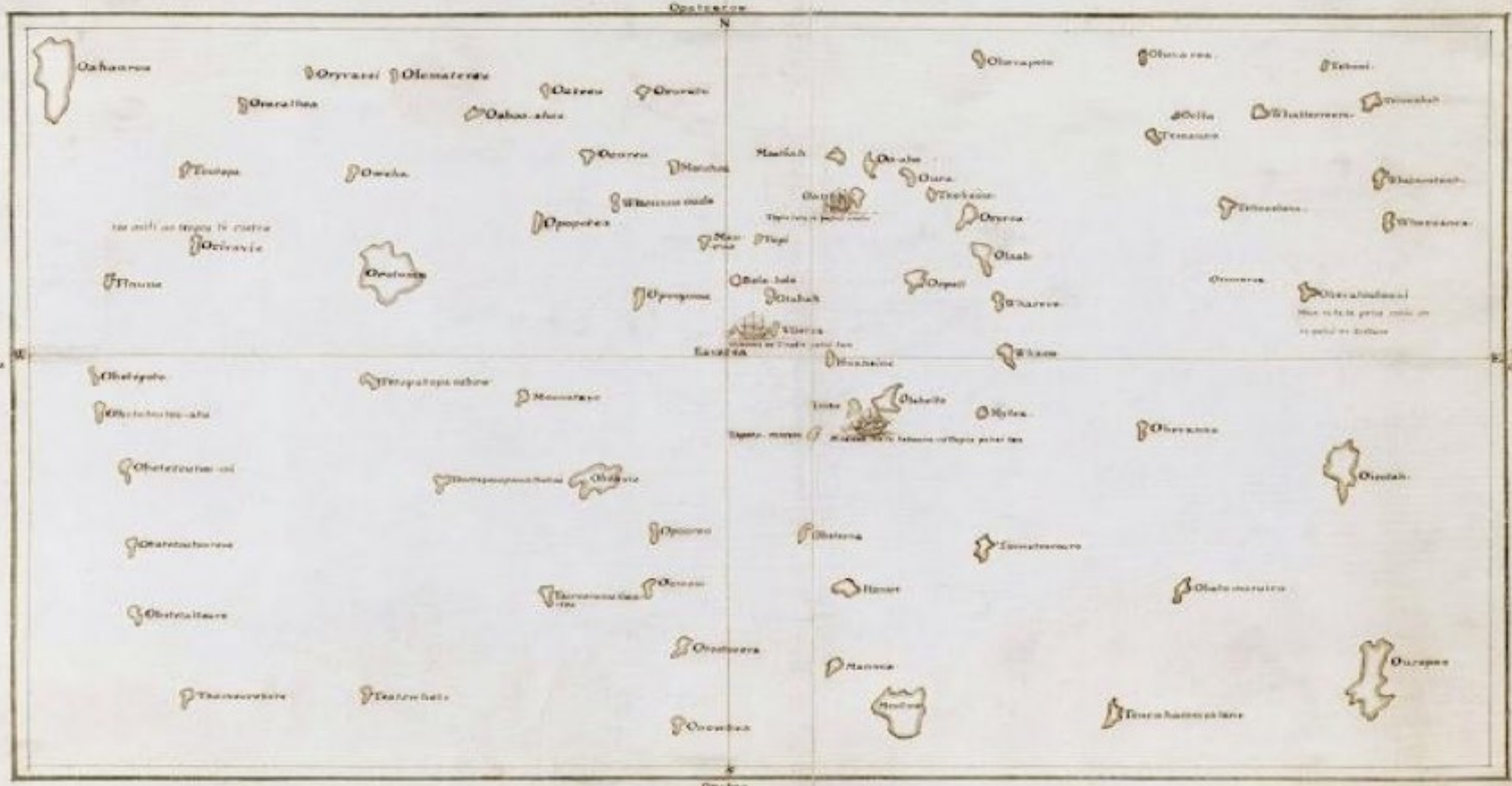
74 Islands

Charted from memory

Polynesian wayfinders read stars, swells, birds and clouds - and settled a vast triangle of ocean from Hawaii to New Zealand to Easter Island






N
W
E
S

The Seafarer's Verdict

Tupaia

Navigation	●●●●●
Leadership	●●●○○
Risk	●●●●○
Discovery	●●●○○

What I Admire

Navigating by knowledge alone across thousands of miles of ocean, with no compass, chart or chronometer

What I Would Question

He did not discover these islands - his ancestors did, centuries before any European. So, who were the real explorers?

The Professional

Roald Amundsen - The Man

- Born in 1872 in Borge, south-east Norway, into a family of shipowners

- Abandoned medical studies to go to sea, determined to become a polar explorer

- Learned fur clothing, dog driving and cold-weather survival from the Netsilik Inuit

- First to sail the Northwest Passage, in the tiny Gjøa (YUH-ah), from 1903 to 1906

At A Glance

Born
1872, Norway

Sailed For
Norway

Era
1897 To 1928

The Race to the South Pole

Aboard Fram, 1910 To 1912

Aug 1910

Leaves Norway, telling almost nobody he is heading south, not north

Sep 1910

Telegrams Scott from Madeira that Fram is proceeding to the Antarctic

Dec 1911

Reaches the South Pole on 14 December with four companions

1926

Flies over the North Pole in the airship Norge

34 Days

Ahead of Scott

Every man in Amundsen's polar party came home - Scott and his four companions did not




FRAM
NORGE

The Seafarer's Verdict

Roald Amundsen

Navigation	●●●●●
Leadership	●●●●●
Risk	●●●●●
Discovery	●●●●○

What I Admire

Meticulous preparation - the right clothing, the right dogs, depots laid in advance and no room for heroics

What I Would Question

His ruthless planning included killing many of his dogs to feed the rest - efficient, but hard to love

The Last 100 Years

When Exploration Went Up, Down and Out of This World

The Top of the World

Edmund Hillary and Tenzing Norgay

- Reached the summit of Everest at 11:30 on the morning of 29 May 1953

- A New Zealand beekeeper and a Sherpa mountaineer, part of a British expedition led by John Hunt

- The news reached London on the morning of the Queen's Coronation (2 June 1953)

- Hillary later drove a tractor to the South Pole in 1958

8,849 m

(29,032 feet) - Everest's current official height

The Frontier

The last great prize on the surface of the Earth - the highest point of all





The Bottom of the Ocean

Jacques Piccard and Don Walsh

- Reached the Challenger Deep, the deepest point on Earth, on 23 January 1960

- Their craft, the bathyscaphe Trieste, took nearly five hours to reach the bottom

- An outer window cracked with a loud bang on the way down - they carried on regardless

- Walsh was a serving US Navy lieutenant, Piccard a Swiss engineer and son of a pioneering balloonist

10,900 m

About 35,800 feet down in the Mariana Trench

The Frontier

The deepest ocean - under more than 1,000 times the pressure at the surface




Sea Level
Diving suit
Maximum depth 600 m
Depth to which light penetrates 100 m
1,000 m
Military submarines
Maximum depth 900 m
Sperm whale
Found at depths up to 1,150 m
2,000 m
3,000 m
RMS Titanic
Located 1987 at depth of 3,800 m
4,000 m
Average ocean depth
4,267 m
Deepest point of Arctic Ocean
5,607 m
5,000 m
Sea Cliff
Record for a submersible
6,000 m
in March 1985
6,000 m
7,000 m
Mount Everest inverted depth
8,849 m
8,000 m
Trieste
The first vessel to reach the bottom of the Challenger Deep at 10,916 m
9,000 m
10,000 m
11,000 m
Japan
Pacific Ocean
Philippines
Mariana Trench

The First Human in Space

Yuri Gagarin

- Launched aboard Vostok 1 on 12 April 1961 and orbited the Earth once

- The son of a carpenter on a collective farm, he trained as a foundry worker before learning to fly

- Nobody knew for certain whether a human could survive the journey - he proved it

- Ejected before landing and came down by parachute, a detail kept secret for years

108 Minutes

From launch to landing

The Frontier

Space itself - nobody had ever left the Earth and returned


СССР
СССР



The Last 100 Years - 1969

One Small Step

Neil Armstrong

- Stepped onto the Moon on 21 July 1969, with Buzz Aldrin following minutes later

- A former US Navy pilot who flew combat missions in the Korean War

- Took manual control to steer past a boulder field, landing with fuel running low

- Only 12 people have ever walked on the Moon, all between 1969 and 1972 ... until next year (maybe)

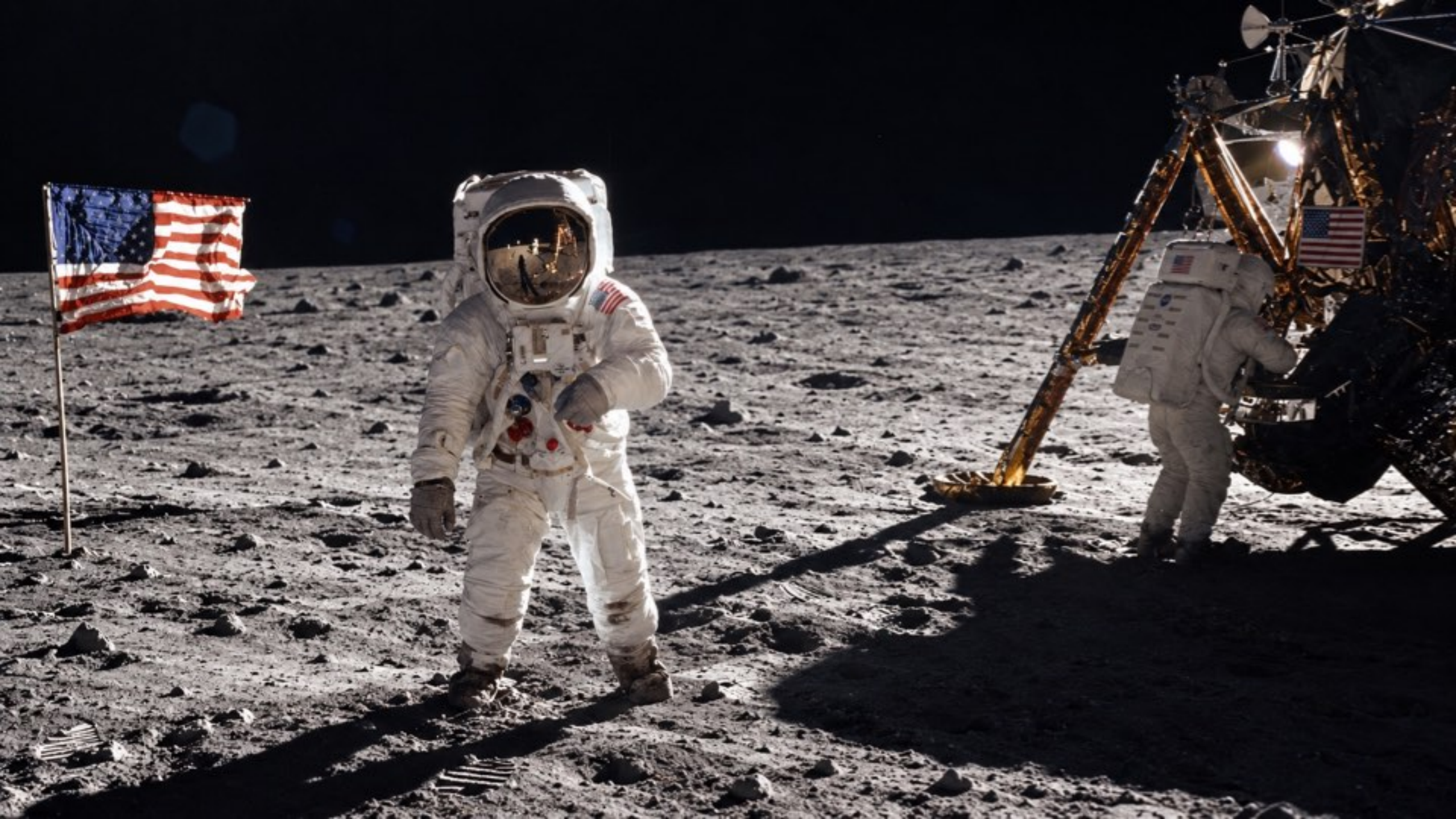
600 Million

Watched the landing live on television

The Frontier

Another world - the first human footsteps anywhere beyond the Earth


NASA
ARMSTRONG



Secrets of the Deep

Robert Ballard

- Part of the 1977 team that found hot vents on the seabed teeming with life - without sunlight (just chemical energy)

- Found the wreck of Titanic on 1 September 1985 with a French team led by Jean-Louis Michel

- The Titanic search was cover for a secret US Navy mission to survey two lost nuclear submarines

- Went on to find the Bismarck, USS Yorktown and John F Kennedy's PT-109

3,800 m

(12,500 feet) - the depth of the Titanic wreck

The Frontier

The deep ocean floor - where life was found that needs no sunlight at all




589



Around the World via Both Poles

Sir Ranulph Fiennes

- Led the Transglobe Expedition from 1979 to 1982 with Charles Burton

- The first to circle the Earth via both the South and North Poles by surface travel alone

- In 1993, made the first unsupported crossing of Antarctica on foot (with Mike Stroud)

- The Guiness Book of records lists him as the world's greatest living explorer

3 Years

The first surface journey around the world via both Poles

The Frontier

Both Poles in a single journey - the whole Earth, top to bottom



Pioneers of Exploration



Sir Ranulph Fiennes believed there were still blank spaces on the map.

In 1979, he departed Greenwich with a mission no one had achieved before: to circle the globe through both poles without leaving the Earth's surface.

Three years later, after crossing Antarctica, the Arctic Ocean and thousands of miles of open sea, he returned having completed one of history's greatest expeditions.

The Transglobe Expedition remains a benchmark for endurance, resilience and human determination.

THOSE WHO WENT FIRST.
THOSE WITH THE COURAGE
TO LEAVE LAND BEHIND.



The Route

Greenwich → Europe → Sahara → West Africa → Cape Town → Antarctica → South Pole → New Zealand → Australia → North America → Yukon → Northwest Passage → North Pole → Svalbard → Greenwich.

"The ice about us spat, cracked and boomed as the floes contracted. The temperature measured -40°C, but the prevailing wind meant an actual temperature of -90°C."

— Sir Ranulph Fiennes,
Transglobe Expedition, Antarctica, 1982



The Final Reckoning

The Greatest Explorer of All

My Verdict



James Cook

1728 to 1779

Master navigator, fine leader, and the man who put more of the Pacific on the map than anyone before him



The Greatest Leap

Yuri Gagarin

First into the complete unknown, with no guarantee of coming back



The One You Should Know

Tupaia

The navigator who helped guide the greatest explorer of all

One Final Thought

The Least Explored Place on Earth

Is Directly Beneath this Ship



12

People have walked on the Moon

2

People reached the Challenger Deep in the 50 years after 1960

About 28%

Of the seabed has been mapped in detail

The age of exploration is not over - it is just a few kilometres (a couple of miles) straight down

Our Oceans are Big!



About 71% of the world's surface is covered in water; 95% of that is in our oceans

... and yet only about 28% of the World's oceans are surveyed to modern standards with modern sonar (or an area about five times the size of South America)

... and only 5% of the seabed has been explored from a topographic perspective

Illustration of Resolution

Earth Surface



Mapped to
30 cm per pixel



Moon Surface



Mapped to
10 m per pixel



Mars Surface



Mapped to
20 m per pixel



Earth Ocean Seabed



Mapped to
4,000 m per pixel





To map the 139 million square miles of seabed to the same fidelity as the land would takeone ship a thousand years


Thank You