Geography Lesson Plan

Cycle 4: New World

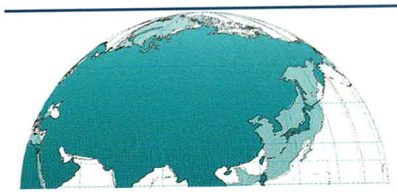
		textbook	supplemental materials
Week 1	Early Cartography (Part 1)	p. 6-9, 178-179	*Maps of the Ancient Sea Kings*
Week 2	Early Cartography (Part 2)	p. 6-9, 178-179	*Maps of the Ancient Sea Kings*
Week 3	Oceania: Australia Physical	p. 152-153	Read some Captain Cook
Week 4	Oceania: Australia Cities & Provinces	p. 160-161, 158	Animals of Australia
Week 5	Oceania: New Zealand, Pacific Islands	p. 152-153	Captain Cook
Week 5	Oceania: Pacific Islands		Captain Cook

		textbook	supplemental materials
Week 13	The Caribbean		Diario of Christopher Columbus
Week 14	South America Physical	pp. 38-43, 44-45, 50-53	Captain Cook?
Week 15	South America Major Cities		*Into the Amazon* (?)
Week 16	South America Political	pp. 38-43, 44-45, 54	
Week 17	Antarctica	pp. 170-177	Captain Cook
Week 18	Arctic		Captain Cook

		textbook	supplemental materials
Week 25	North America Physical—Waters	pp. 24, 20-21	
Week 26	North America Physical—Lands	pp. 24-25, 20-21	
Week 27	North America Major Cities & Political	pp. 26, 30, 36, 20-21	
Week 28	United States Historical	pp. 22-23, 33-35	
Week 29	United States: States	pp. 25, 30-35	
Week 30	Texas		

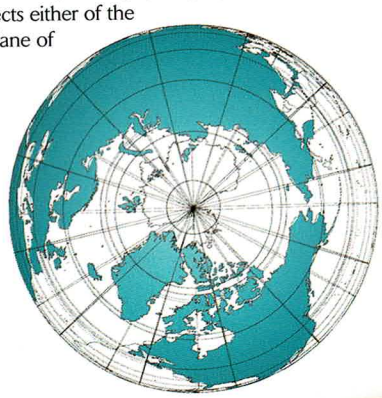
Theme to return cover, repeatedly, every year: Why are political lines, cities, languages divisions where they are on maps? Dangers of using maps to artificially divide up the earth.

AZIMUTHAL PROJECTION

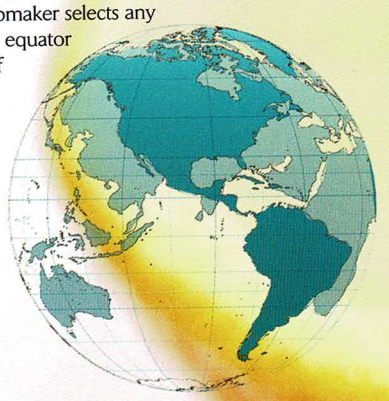


Plane of projection A line tangent to the point on the globe determines the aspect.

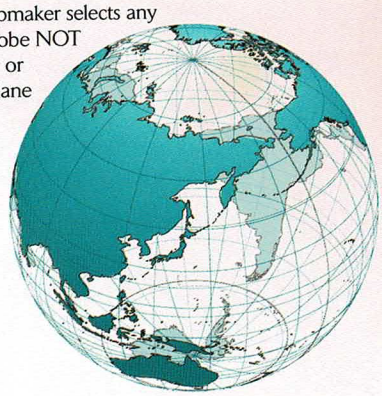
Polar Aspect Globe, Orthographic projection. Mapmaker selects either of the poles for the plane of tangency.



Equatorial Aspect Globe, Orthographic projection. Mapmaker selects any point along the equator for the plane of tangency.

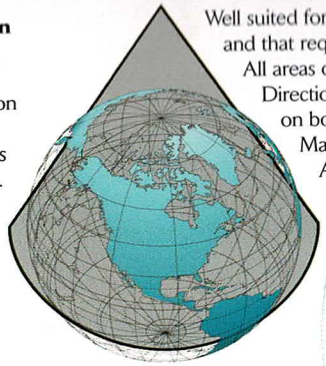


Oblique Aspect Globe, Orthographic projection. Mapmaker selects any point on the globe NOT on the equator or poles for the plane of tangency.



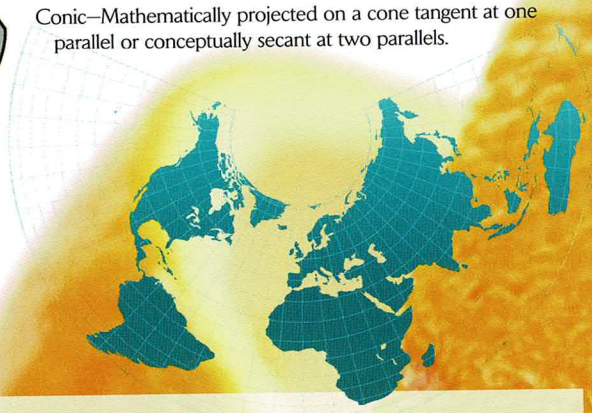
CONIC PROJECTION

Albers Equal Area Conic



Well suited for large countries or other areas that are mainly east-west in extent and that require equal-area representation. Used for many thematic maps. All areas on the map are proportional to the same areas on the earth. Directions are reasonably accurate in limited regions. Distances are true on both standard parallels. Scale true only along standard parallels. Map is not conformal, perspective, or equidistant. Presented by H. C. Albers in 1805.

Conic—Mathematically projected on a cone tangent at one parallel or conceptually secant at two parallels.



ORANGE PEELS and PERSPECTIVES

Map Projections

Consider an orange peel that you have carefully removed in one piece. Now lay the orange peel flat. How does laying the peel flat distort your perception of the orange? Map distortions are the result of such an attempt. Taking a round figure, the earth, and placing it on a flat sheet of paper causes quite a conundrum. Cartographers have wrestled with this dilemma for years, and the outcome is a variety of map projections.

Three main types of nautical map projections exist: the **azimuthal**, the **conic**, and the **cylindrical**, each projection possessing its own strengths and weaknesses. Some projections distort the size of figures on a map, while other projections distort the shape. Skews also affect the location of the equator on a map. Because a "perfect" map does not exist, the purpose and utilization of a map determines the projection of choice. The azimuthal skew is useful for mapping polar regions, portraying celestial bodies, and studying earthquakes, air travel, and radio use. The most common type of azimuthal projection is the orthographic. Cartographers apply the second major projection, the conic, to representations of large countries and North and South America. Lastly, map makers employ the cylindrical projection to design world maps. For centuries, sailors have navigated by these depictions of the world. The popular Mercator, Miller, and Robinson projections are forms of the cylindrical projection.

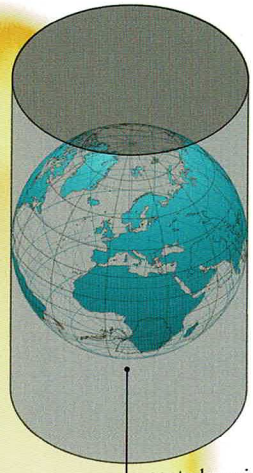
Miller Projection

The projection of choice for the non-historic maps contained within this resource is cylindrical. This skew derives its name from the shape onto which the globe is projected, a cylinder. When the cylinder is unfolded, a rectangular map is created, like the label of a soup can that is removed from the can. As a type of cylindrical projection, the Miller depiction of the world possesses a rectangular outline. The lines of latitude on a Miller map are therefore parallel and the lines of longitude, or meridians, run perpendicular to the lines of latitude, creating a grid. As the lines of latitude move toward the poles, the

"Since my youth geography has been for me the primary object of study. When I was engaged in it, having applied the considerations of the natural and geometric sciences, I liked, little by little, not only the description of the earth, but also the structure of the whole machinery of the world, whose numerous elements are not known by anyone to date."

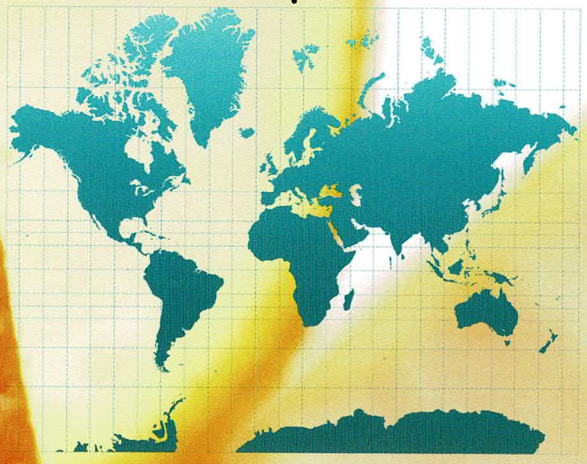
—Gerardus Mercator (1578)

Mercator Projection Central meridian is selected by the mapmaker. Great distortion at high latitudes, but reasonably true shapes and distances within 15 degrees of the equator.

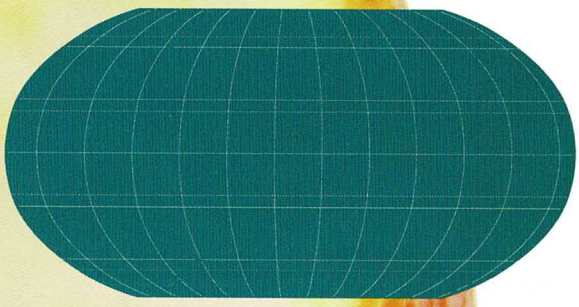


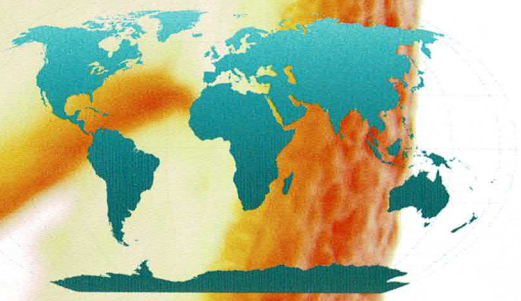
Equator touches cylinder if cylinder is tangent.

central meridian



The **Robinson Projection** features a straight equator, central meridian and lines of latitude (parallels). The central meridian is 0.53 as long as the equator. Concave meridians are equally spaced from the center.





distance between the lines of latitude increases. This results in some distortion at the poles; the distortion, however, is minimized. Straight lines and diminished distortion enable a student to more easily copy and create proportionate world maps.

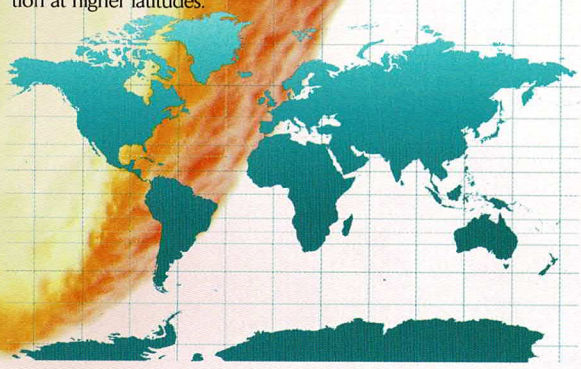
The Art of Cartography

A fantastic way to learn the countries, capitals, and features of the world is to draw them! Students of all ages can develop cartography skills by tracing, copying, and drawing maps. The outline maps provided in this resource are simple outlines of various countries and continents that should be used by students only as a beginning reference point. Students that start with tracing should be encouraged to quickly move to drawing straight from the atlas to hone their cartography skills.

Spelling

Due to the difficulty of translating the names of some countries and capitals into English, the spelling of these countries and capitals vary. The spellings chosen for this resource come from the CIA *World Factbook*.

Miller Projection Like the Mercator projection, the central meridian is chosen by the mapmaker. However, the equator always touches the cylinder, and the change in spacing of parallels is less than that of the Mercator projection, resulting in less distortion at higher latitudes.



Geography

Early Cartography

Cycle 4, Week 1

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Bring:

   - *Exploring the World Through Cartography* (pages 10–11)
   - Guyot *Geography*
   - *Maps of the Ancient Sea Kings*, by Hapgood
   - *Longitude*, by Dava Sobel
   - *The Puzzle of Ancient Man*, by Donald Chittick
   - *Frozen in Time*, by Michael Oard
   - Globe

2. Printed pages for display (mostly for next week!):

   1. Piri Re'is Map
   2. Beatus Medieval Map
   3. Andreas Walsperger Map
   4. Dulcert Portolano
   5. Tracing of the Dulcert Portolano
   6. Idrisi Map
   7. Map of Ptolemy
   8. World Map of Eratosthenes
   9. Pomponius Mela World Map
   10. Oronteus Finaeus Map
   11. Dutch Royal Palace
   12. Dutch Eastern Hemisphere
   13. Dutch Western Hemisphere
   14. Delisle World Map

3. Handouts for notebooks:

   - Piri Re'is Map
   - Book excerpt: *Maps of Ancient Sea Kings* (only one copy per family)

To Start

1. Explain Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its

surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

The Central Problem of Mapmaking

1. Show them the globe; show them the parts of the earth we'll be studying this year (Americas, Oceania, and the poles).

2. We're going to begin the year by learning just a little bit about the history of Cartography.

3. But before we start looking at the history of Cartography, you need to have a little understanding of how difficult it is to make good maps.

4. What makes a map good?

    a. Accuracy.

5. Maps can be super simple or very, very detailed. Maybe you've made a map of your house, or your yard, or your street? Or showing your house over here, and your church over there? The simplest maps can give directions that are very helpful!

    But simple maps can also leave people confused, or lead people the wrong way, because the mapmaker didn't include enough detail, or accurate detail. (Example could be a simple map on the white board, with Wisdom's Way and student's house—but if someone tried to follow it, he would never find WW!)

    The bigger the area you try to draw on a map, the harder this problem is to solve.

6. What about measuring distances? There are trees, and hills, and oceans, and all sorts of things in the way! People put a *lot* of work into accurately calculating distances, in the past!

7. And there's an added problem. (Draw on white board to demonstrate ...)

    - Take these three cities: Memphis, TN, Fort Smith, AR, and St. Louis, MO.

- Fort Smith is pretty much directly West of Memphis, and St. Louis is pretty much directly North of Memphis. So the three cities ought to make a right triangle. If we have the distances of two legs of the triangle, we can use basic Geometry (the Pythagorean Theorem) to discover the third leg of the triangle.
- Memphis, Tennessee to Fort Smith, Arkansas— 249 miles.
- Memphis, Tennessee to St. Louis, Missouri— 243 miles.
- Using the Pythagorean Theorem, the distance from Fort Smith to St. Louis ought to be 348 miles.
- But it's actually 320 miles!
- Why? Because the earth isn't a flat surface!!!!
- So how can you draw an accurate map, on a flat piece of paper, of something that is a round ball?!?!
- The central problem of mapmaking has always been: How do you put a spherical shape accurately on a flat surface?
- (Show *Exploring the World Through Cartography*, pages 10–11, read first paragraph.)
- The problem is seriously *that big!!!!!!*

Early Maps

1. The history of cartography—how mapmaking has gotten better and better over time—is so fascinating that I want to read to you about it this week and next week, and we'll look at lots of cool old maps!

    a. Briefly show them all of the cool maps you've brought, but just for a sec; we'll look at them in more detail next week!

2. In this story, you'll get to see a lot of examples of old maps, so you can learn about the history of cartography by seeing these examples of old maps for yourself, but you will also get to hear through this story a lot about how maps were made at different times in history. So, you get to hear a true story, which will teach you lots about mapmaking and the history of mapmaking.

3. One thing you will notice is that most of these maps are beautiful. This is partly because God's world is beautiful, and maps are a chart representing God's world; and partly because cartographers love to make their work beautiful themselves, as men created in the image of God. He designed us so that, copying Him, we can make beautiful things!

4. The book we're going to read a little from these next couple of weeks is the story of an old map, that is actually much older than it appears! The Bible tells us that man was originally really smart, perfectly created in the image of God.

a. Recommended reading: *The Puzzle of Ancient Man*, by Donald Chittick!!!

5. Christians today, including one of my Christian professors in a summer study course(!!!!)—one of the men who *loves the Lord and his Word*, and is passionate about our wonderful Lord—have continued the long line of godly men who have devoted their lives to studying God's creation.

    a. The glory of God is to conceal a thing secret: but the King's honor is to search out a thing. (Pr. 25:2)

    b. These men—Kurt Wise, Russell Humphreys, Steven Austin, John Baumgardner, Andrew Snelling, and Larry Vardiman—looked at the matter of the Plate Tectonics Theory of the earth's crust. "In 1859 Antonio Snider proposed that rapid, horizontal divergence of crustal plates occurred during Noah's Flood." Darwinists took that model and co-opted it into their story about the continents drifting slowly over millions of year, but their theory leaves many problems unexplained.

    c. These Christians, highly skilled scientists in their own fields, studied the matter carefully and came up with the Catastrophic Plate Tectonics Model (which we study in Cycle 2!), which explains how the Flood may have happened through the ocean floor being literally broken up, as the Bible says, "The fountains of the great deep were broken up."

    d. Michael Oard, another God-fearing scientist, exploring God's creation in the field of weather, considered what would have happened to the earth after the Flood, if this theory were, indeed, the very way the Flood took place.

    e. He concluded that if the Catastrophic Plate Tectonics Model were correct, then for perhaps about 500 years after the Flood, the world would be plunged into an Ice Age.

    f. Recommended reading: *Frozen in Time*, by Michael Oard!!!!!!

6. Here's the reason why I'm telling you all of this: In Michael Oard's Ice Age model (and by the way, his computer models are the most accurate models of any climatologist in the world!!), the Ice Age would have had some key differences from the ice age models proposed by atheistic scientists. (And there would have only been *one* Ice Age, not many ice ages like the Darwinists believe.)

    a. In his model, the middles of continents would have been the first thing to get glaciated, and the coastlines would have stayed free from ice for hundreds of years after the Flood.

b. And I'm telling you all of that because...

7. Chapter 1 of the *Maps of the Ancient Sea Kings*, Reading #1.

    a. Pass out the Piri Re'is Maps to the children. (They can look at their map while you read; you may point out the coasts of Africa, Europe, and South America to them.)

    b. Notes: Columbus discovered America in 1492.

    c. Longitude—Recommended reading: *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time*, by Dava Sobel.

8. Continue with chapter 1 of the *Maps of the Ancient Sea Kings*, Reading #2.

    a. Source maps: Sea captains each need very detailed maps, the best maps they can get ahold of. So there was an entire industry of cartographers, who copied maps.

    b. Just like with books, they would copy the work of previous cartographers. And often, a cartographer would have his best map, and then when a sea captain would come back with new discoveries, he would add the new information to his maps.

    c. So maps in those days would often be pieced together from other maps. Ex: Maybe you had a great map of the Mediterranean, but you didn't have a lot of detailed information about Northern Europe. And then a sea captain visiting from the Netherlands showed you the great map he had of Northern Europe. So you would copy the details from his Northern Europe map to replace the sketchy Northern Europe you have on your best map.

9. Continue with chapter 1 of the *Maps of the Ancient Sea Kings*, Reading #3.

    a. According to Darwinists, Antarctica was completely covered with ice 20 million years ago, and people didn't "evolve" until less than 1 million years ago.

    b. Plus, according to Darwinists, people started out as monkeys, and have gotten smarter and smarter—people were dumber in the past. So no men could have done better earth exploration in the past than we've done today!

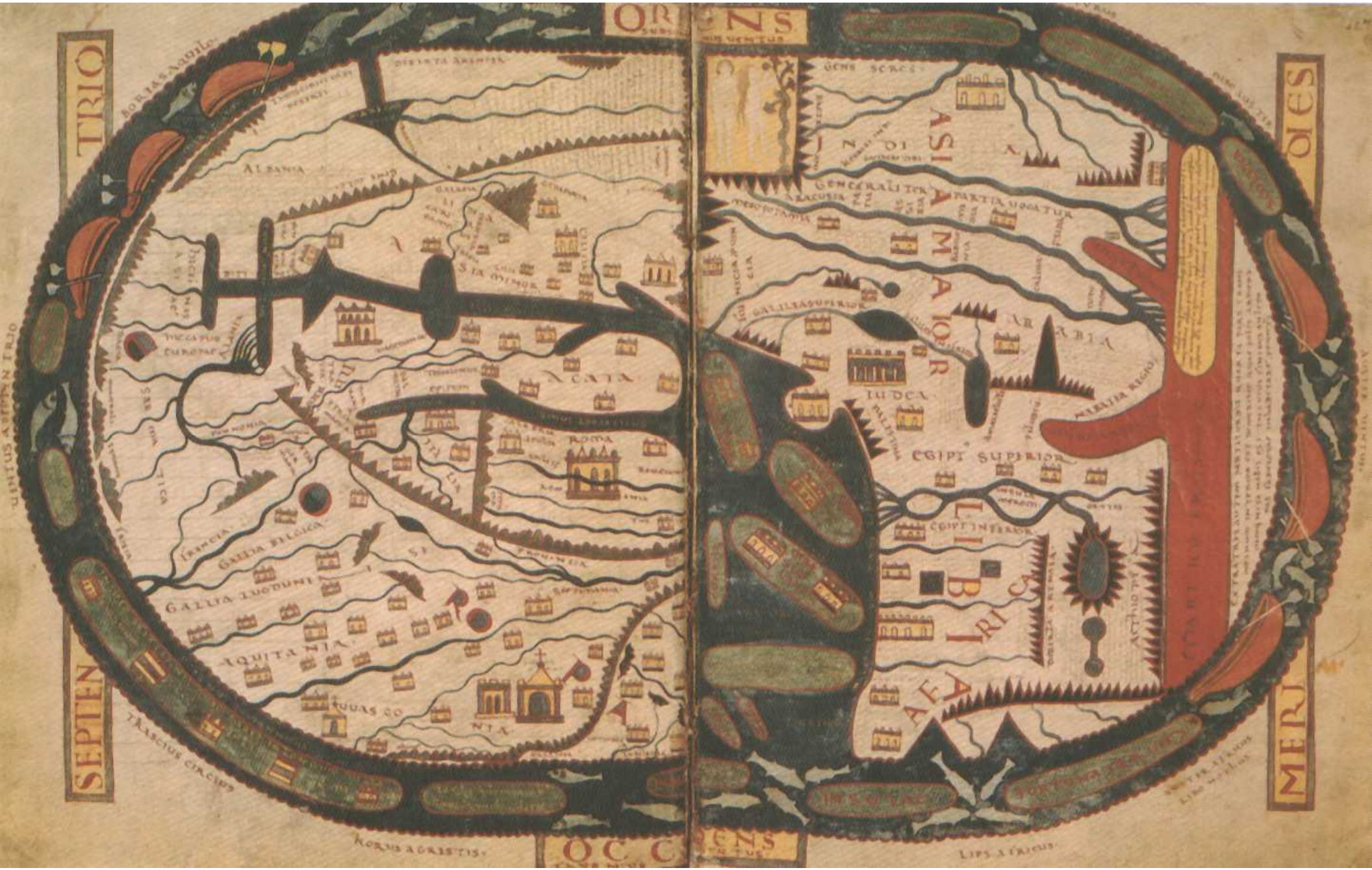
c. But the Bible tells us that God created the first man perfectly, so we have only gotten sicker and dumber since the Fall, because of the effects of sin. ("For we know that every creature groaneth with us also, and travaileth in pain together unto this present." Romans 8:22)

d. And the work of scientists who fear God and reject all "science" teaching that contradicts the Bible, but rather *submit* their scientific work *under* the authority of the Bible, has discovered that the coast of Antarctica was probably free from ice after the Flood!

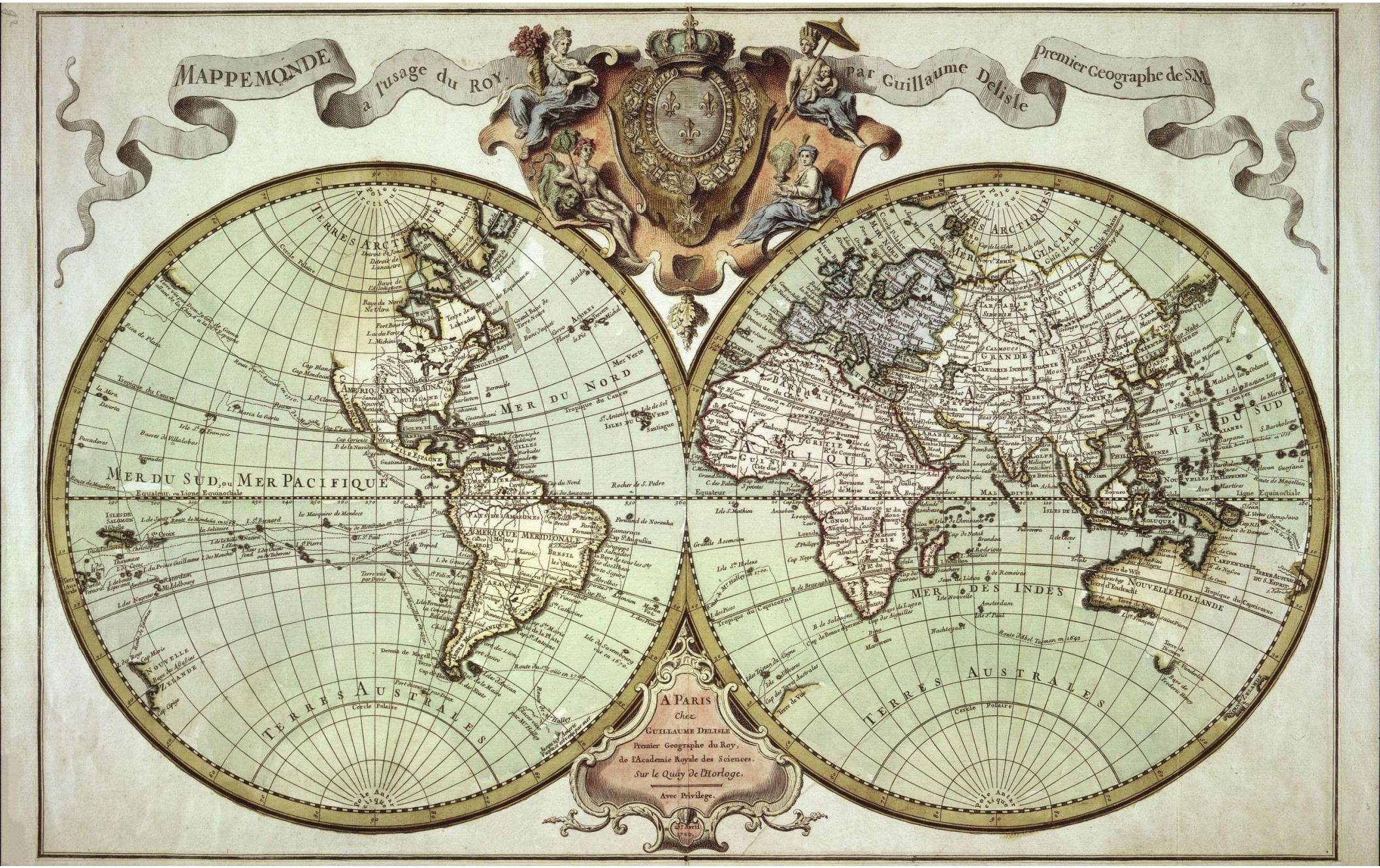
e. (You know, when all of the men living were descended from a ship builder of such excellent proficience that he built the only ship sturdy enough to keep himself and his family safe in the Great Flood—and every animal kind, too!!!!)

10. What happened next is that Hapgood, the author of this book, and his students at college thoroughly researched this map to find out if it really was a map from 1513, and if it really did show information that *no one on earth knew in 1513*. Could it be that ancient men had better explored the earth than men at the dawn of the Age of Exploration and the Reformation????

The Andreas Walsperger Map (1448)



The S. Osma Beatus Medieval World Map



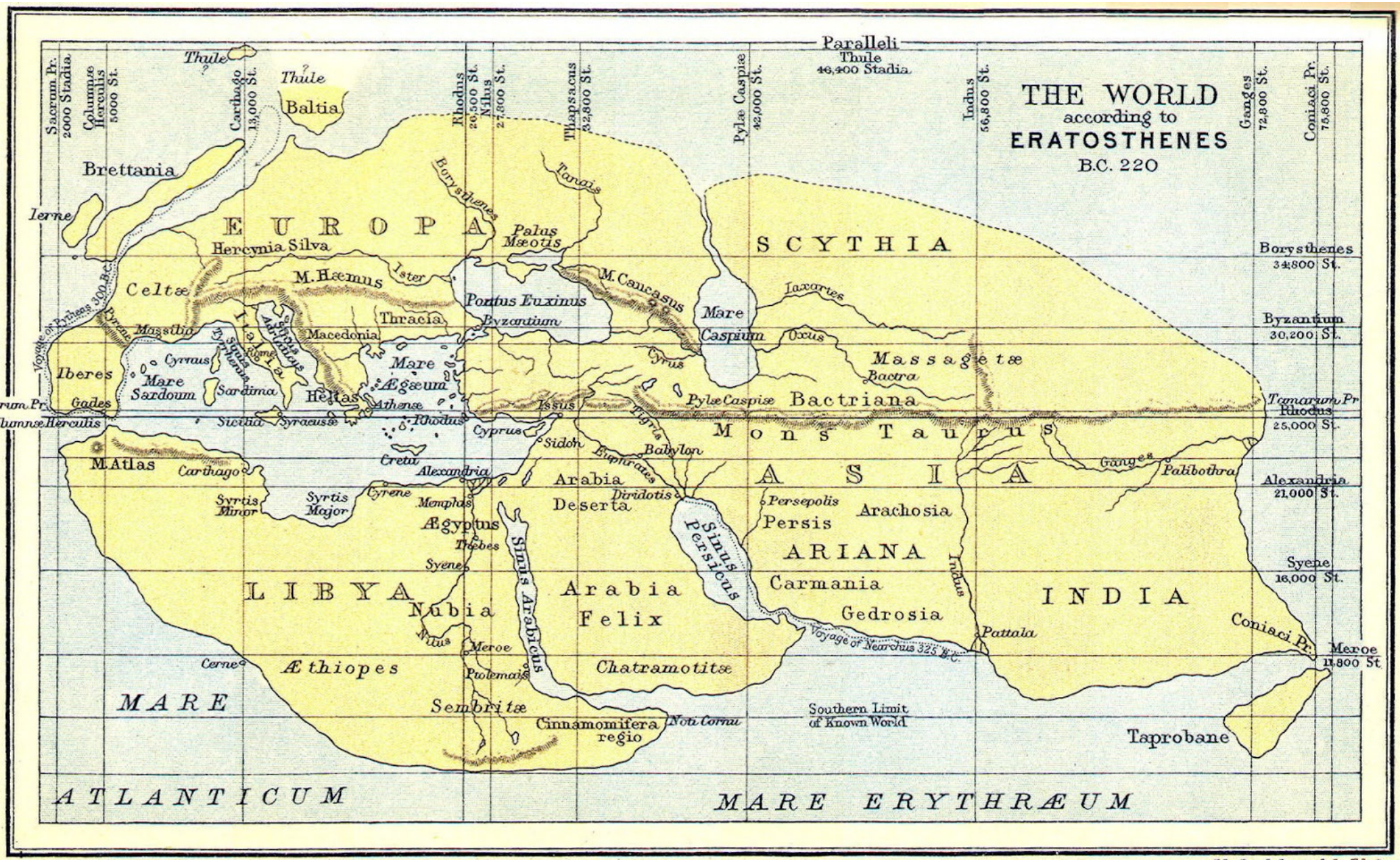
The World Map of Delisle (1720)

(Notice that everything that has not been newly discovered and verified in their age has been erased—and see how much had been explored, in under 250 years, by men with biblical worldviews, with God helping them!)

The Dulcert Portolano (1339)

Dutch Royal Palace, maps of world on the floor (in marble), completed 1655.


CIRCULUS ANTARCTICUS
POLUS ANTARCTICUS MERIDIES
TERRA CONCORDIA
TERRA DIEMENSIS



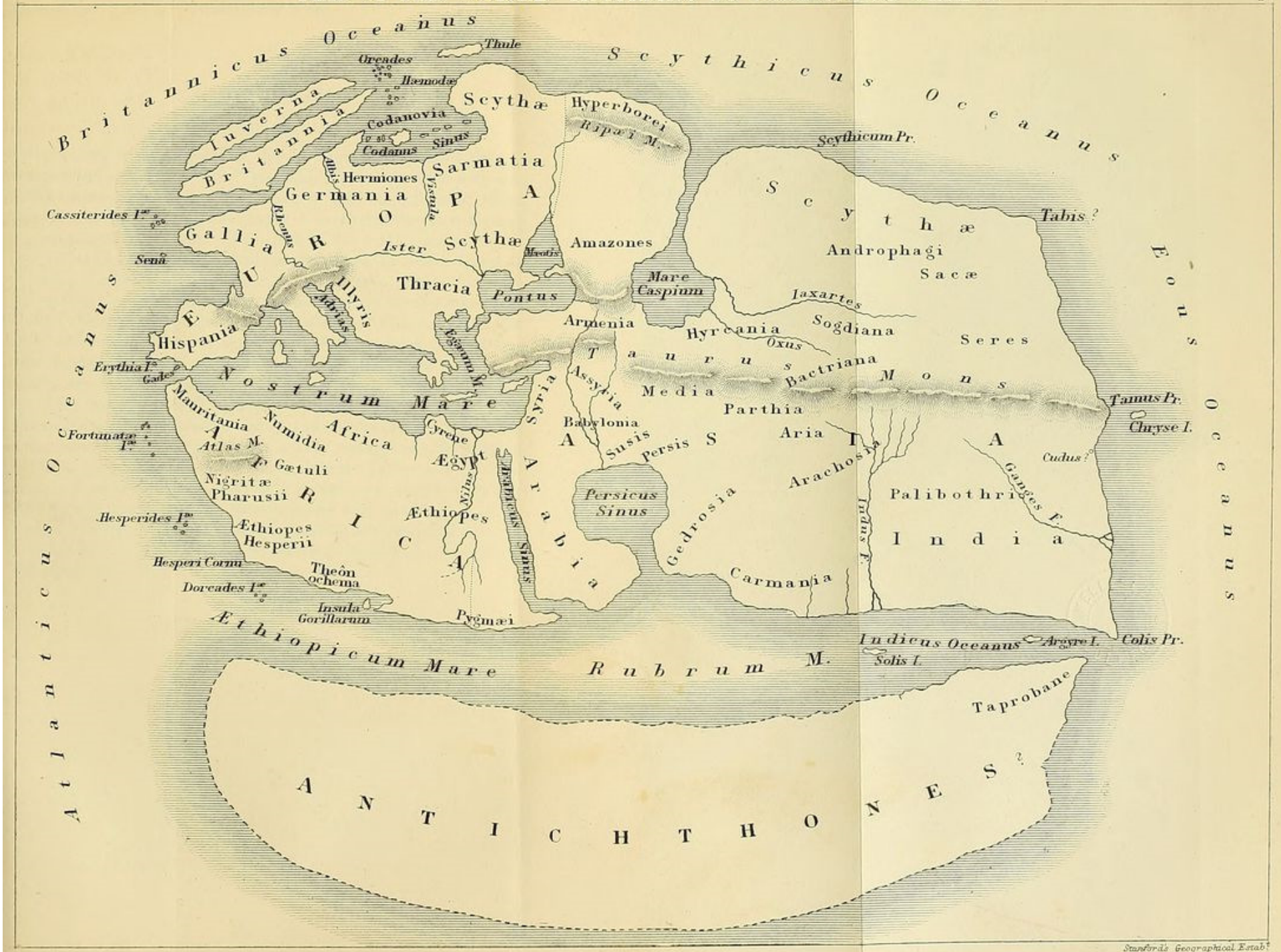
The World Map of Eratosthenes

The World Map of Idrisi

Oronteus Finaeus Map (1531)

Dünya Haritası, Piri Reis
Topkapı Sarayı Müzesi Kütüphanesi. No. H. 1824
The World Map, Piri Reis
Library of Topkapı Palace Museum. No. H. 1824

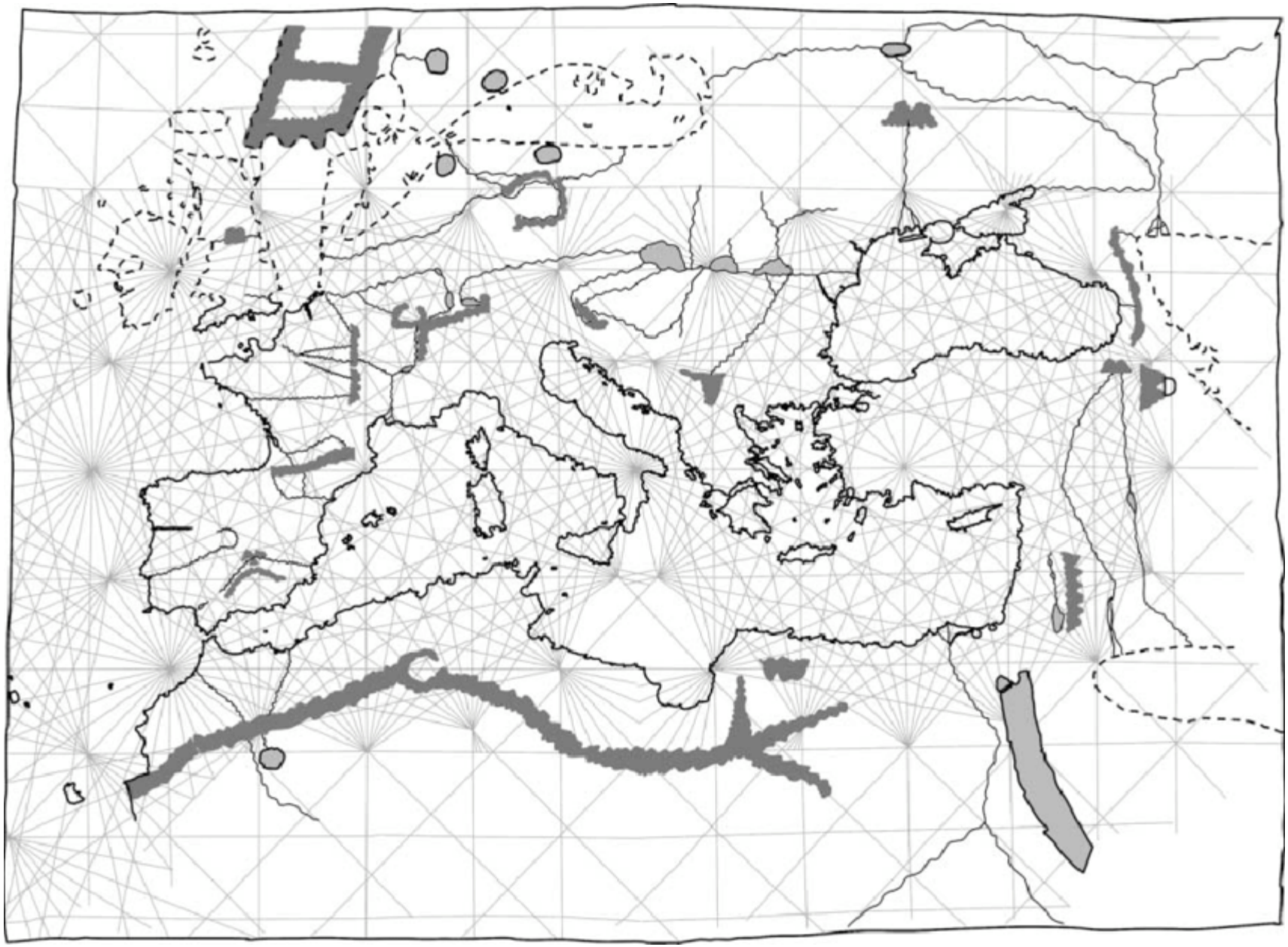
MAP OF THE WORLD ACCORDING TO POMPONIUS MELA.



Stanford's Geographical Estab.t

London: John Murray.

The World Map of Ptolemy



Tracing of the Dulcert Portolano


CHAP
TER I
THE
TREASURE
HUNT
BEGINS

In 1929, in the old Imperial Palace in Constantinople, a map was found that caused great excitement. It was painted on parchment, and dated in the month of Muharrem in the Moslem year 919, which is 1513 in the Christian calendar. It was signed with the name of Piri Ibn Haji Memmed, an admiral of the Turkish navy known to us as Piri Re'is.[1]

The map aroused attention because, from the date, it appeared to be one of the earliest maps of America. In 1929 the Turks were passing through a phase of intense nationalism under the leadership of Kemal, and they were delighted to find an early map of America drawn by a Turkish geographer. Furthermore, examination showed that this map differed significantly from all the other maps of America drawn in the 16th Century because it showed South America and Africa in correct relative longitudes. This was most remarkable, for the navigators of the 16th Century had no means of finding longitude except by guesswork.

Another detail of the map excited special attention. In one of the legends inscribed on the map by Piri Re'is, he stated that he had based the western part of it on a map that had been drawn by Columbus. This was indeed an exciting statement because for several centuries geographers had been trying without success to find a "lost map of Columbus" supposed to have been drawn by him in the West Indies. Turkish and German scholars made studies of the map. Articles were written in the learned journals, and even in the popular press.[2]

One of the popular articles, published in the *Illustrated London News* (1),[3]

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[1] From his title, Re'is, "admiral." Pronounced "Peeree Ry-iss." See Note 1.

[2] See the Bibliography, Nos. 1, 2, 5, 6, 23, 27, 28, 36, 40, 61, 78, 83, 104, 105, 106, 109, 115, 117, 154, 181, 187, 208, 215.

[3] Figures referring to specific sources listed in the Bibliography are inserted in parentheses throughout the text. The first number indicates the correspondingly numbered work in the Bibliography, and a number following a colon indicates the page in the work.

caught the eye of the American Secretary of State Henry Stimson. Stimson thought it would be worthwhile to try to discover the actual source Piri Re'is had used, a map which had supposedly been drawn by Columbus and which might still be lying about somewhere in Turkey. Accordingly, he ordered the American Ambassador in Turkey to request that an investigation be made.[4] The Turkish Government complied, but no source maps were found.

Piri Re'is made other interesting statements about his source maps. He used about twenty, he said, and he stated that some of them had been drawn in the time of Alexander the Great, and some of them had been based on mathematics.[5] The scholars who studied the map in the 1930's could credit neither statement. It appears now, however, that both statements were essentially correct.

After a time, the map lost its public interest, and it was not accepted by scholars as a map by Columbus. No more was heard of it until, by a series of curious chances, it aroused attention in Washington, D.C., in 1956. A Turkish naval officer had brought a copy of the map to the U.S. Navy Hydrographic Office as a gift (although, unknown to him, facsimiles already existed in the Library of Congress and other leading libraries in the United States). The map had been referred to a cartographer on the staff, M. I. Walters.

Walters happened to refer the map to a friend of his, a student of old maps, and a breaker of new ground in borderland regions of archaeology, Captain Arlington H. Mallery. Mallery, after a distinguished career as an engineer, navigator, archaeologist, and author (130), had devoted some years to the study of old maps, especially old Viking maps of North America and Greenland. He took the map home, and returned it with some very surprising comments. He made the statement that, in his opinion, the southernmost part of the map represented bays and islands of the Antarctic coast of Queen Maud Land now concealed under the Antarctic ice cap. That would imply, he thought, that somebody had mapped this coast before the ice had appeared.

This statement was too radical to be taken seriously by most professional geographers, though Walters himself felt that Mallery might be right. Mallery called in others to examine his findings. These included the Reverend Daniel L. Linehan, S.J., director of the Weston Observatory of Boston College, who had been to Antarctica, and the Reverend Francis Heyden, S.J., director of the Georgetown University Observatory. These trained scientists felt confidence in Mallery. Father Linehan and Walters took part with Mallery in a radio panel discussion, sponsored by Georgetown University, on August 26, 1956. Verbatim copies of this broadcast were distributed and brought to my attention. I was impressed by the confidence placed in Mallery by men like Walters, Linehan, and Heyden, and, when I met Mallery himself, I was convinced of his sincerity and honesty. I had a

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[4] **See correspondence, Note 2.**

[5] **For a translation of all the legends on the map, see Note 3.**

strong hunch that, despite the improbabilities of his general theories, and the lack, then, of positive proof, Mallery could well be right. I decided to investigate the map as thoroughly as I could. I therefore initiated an investigation at Keene State College.

This investigation was undertaken in connection with my classes at the college, and the students from the beginning took a very important part in it.[6] It has been my habit to try to interest them in problems on the frontiers of knowledge, for I believe that unsolved problems provide a better stimulation for their intelligence and imagination than do already-solved problems taken from textbooks. I have also long felt that the amateur has a much more important role in science than is usually recognized. I teach the history of science, and have become aware of the extent to which most radical discoveries (sometimes called "breakthroughs") have been opposed by the experts in the affected fields. It is a fact, obviously, that every scientist is an amateur to start with. Copernicus, Newton, Darwin were all amateurs when they made their principal discoveries. Through the course of long years of work they became specialists in the fields which they *created*. However, the specialist who starts out by learning what everybody else has done before him is not likely to initiate anything very new. An expert is a man who knows everything, or nearly everything, and usually thinks he knows everything important, in his field. If he doesn't think he knows everything, at least he knows that other people know less, and thinks that amateurs know nothing. And so he has an unwise contempt for amateurs, despite the fact that it is to amateurs that innumerable important discoveries in all fields of science have been due.[7] For these reasons I did not hesitate to present the problem of the Piri Re'is Map to my students.

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[6] See Acknowledgments.

[7] The late James H. Campbell, who worked in his youth with Thomas A. Edison, said that once, when a difficult problem was being discussed, Edison said it was too difficult for any specialist. It would be necessary, he said, to wait for some amateur to solve it.

When our investigation started my students and I were amateurs together. My only advantage over them was that I had had more experience in scientific investigations; their advantage over me was that they knew even less and therefore had no biases to overcome.

At the very beginning I had an idea—a bias, if you like—that might have doomed our voyage of discovery before it began. If this map was a copy of some very ancient map that had somehow survived in Constantinople to fall into the hands of the Turks, as I believed, then there ought to be very little in common between this map and the maps that circulated in Europe in the Middle Ages. I could not see how this map could be *both* an ancient map (recopied) and a medieval one. Therefore, when one of my students said this map resembled the navigation charts of the Middle Ages, at first I was not much interested. Fortunately for me, I kept my opinions to myself, and encouraged the students to begin the investigation along that line.

We soon accumulated considerable information about medieval maps. We were not concerned with the land maps, which were exceedingly crude. (See Figures 1 and 2.) We were interested only in the sea charts used by medieval sailors from about the 14th Century on.[1] These "portolan" [2] maps were of the Mediterranean and Black Seas, and they were good. An example is the Dulcert Portolano of 1339. (Fig. 3.) If the reader will compare the pattern of lines on this chart with that on the Piri Re'is Map (Frontispiece) he will see that they are similar. The only difference is that, while the Dulcert Portolano covers only the Mediterranean and the Black Seas, the Piri Re'is Map deals with the shores of the entire Atlantic Ocean. The lines differ from those on modern maps. The lines do not resemble

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[1] Maps in this book, except where it is otherwise indicated, are taken from the Vatican Atlas (139) or that of Nordenskiöld (146).

[2] The term "portolan" or "portolano" apparently derived from the purpose of the sea charts, which was to guide navigators from port to port.

the modern map's lines of latitude and longitude that are spaced at equal intervals and cross to form "grids" of different kinds. Instead, some of the lines, at least, on these old maps seem to radiate from centers on the map, like spokes from a wheel. These centers seem to reproduce the pattern of the mariner's compass, and some of them are decorated like compasses. The radiating "spokes" are spaced exactly like the points of the compass, there being sixteen lines in some cases, and thirty-two in others.

Since the mariner's compass first came into use in Europe about the time that these charts were introduced, most scholars have concluded that the charts' design must have been intended to help medieval sailors sail by the compass. There is no doubt that medieval navigators did use the charts to help them find compass courses, for the method is described in a treatise written at the time (89, 179, 200). However, as we continued to study these medieval charts, a number of mysteries turned up.

We found, for example, that one of the leading scholars in the field did not believe that the charts originated in the Middle Ages. A. E. Nordenskiöld, who compiled a great Atlas of these charts (146) and also wrote an essay on their history (147), presented several reasons for concluding that they must have come from ancient times. In the first place, he pointed out that the Dulcert Portolano and all the others like it were a great deal too accurate to have been drawn by medieval sailors. Then there was the curious fact that the successive charts showed no signs of development. Those from the beginning of the 14th Century are as good as those from the 16th. It seemed as though somebody early in the 14th Century had found an amazingly good chart which nobody was to be able to improve upon for two hundred years. Furthermore, Nordenskiöld saw evidence that only *one* such model chart had been found and that all the portolanos drawn in the following centuries were only copies—at one or more removes—from the original. He called this unknown original the "normal portolano" and showed that the portolanos, as a body, had rather slavishly been copied from this original. He said:

> The measurements at all events show: (1) that, as regards the outline of the Mediterranean and the Black Sea, all the portolanos are almost unaltered copies of the same original; (2) that the same scale of distance was used on all the portolanos (147:24).

After discussing this uniform scale that appears on all the portolanos, and the fact that it appears to be unrelated to the units of measurement used in the Mediterranean, except the Catalan (which he had reason to believe was based on the units used by the Carthaginians), Nordenskiöld further remarks:

> . . . It is therefore possible that the measure used in the portolanos had its ultimate origin in the time when the Phoenicians or Carthaginians ruled over the

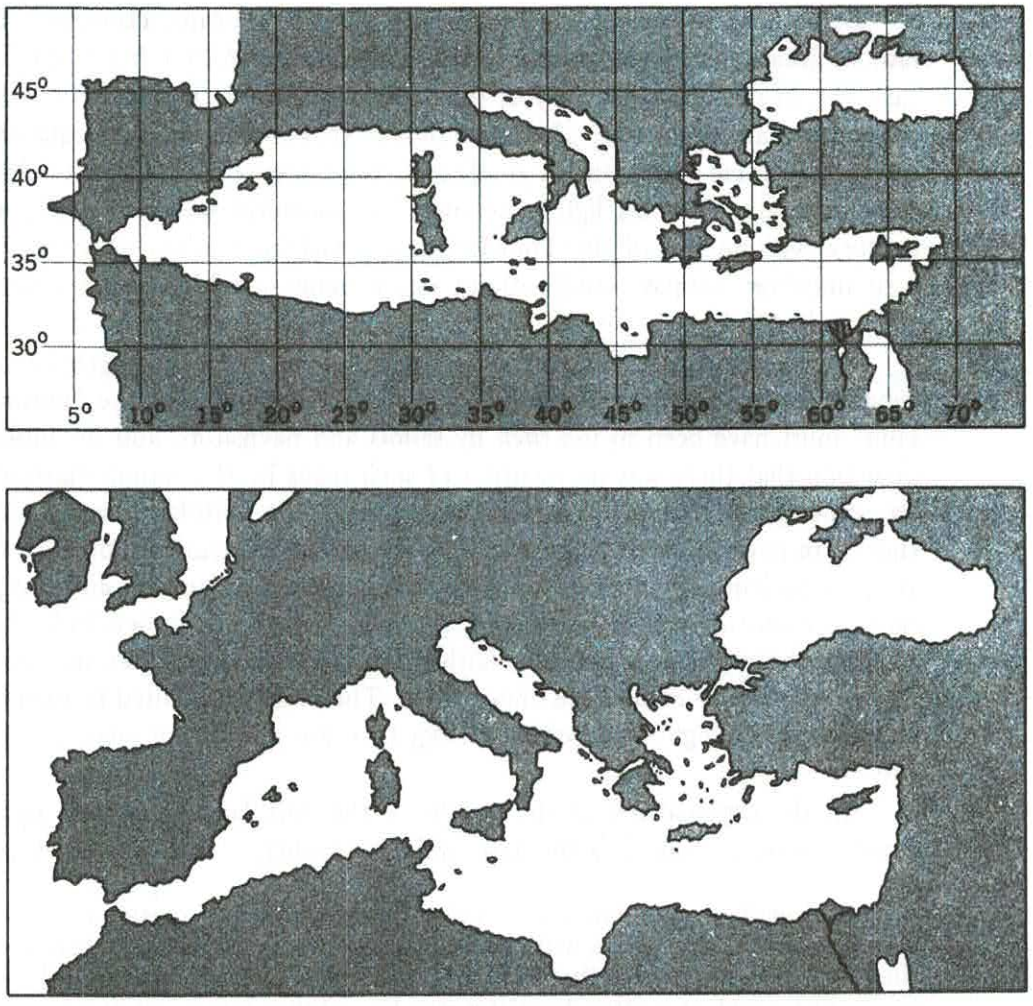

Figure 4. Nordenskiold's comparison of Ptolemy's Map of the Mediterranean (top) with the Dulcert Portolano.

navigation of the western Mediterranean, or at least from the time of Marinus of Tyre . . . (147:24).[3]

Nordenskiöld inclined, then, to assign an ancient origin to the portolanos. But this is not all. He was quite familiar with the maps of Claudius Ptolemy which had survived from antiquity and had been reintroduced in Europe in the 15th Century. After comparing the two, he found that the portolanos were much better than Ptolemy's maps. He compared Ptolemy's map of the Mediterranean and the Black Seas with the Dulcert Portolano (Fig. 4) and found that the superiority of the portolano was evident.

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[3] **Marinus of Tyre lived in the 2nd Century A.D. and was the predecessor of the geographer Claudius Ptolemy.**

Let us stop to consider, for a moment, what this means. Ptolemy is the most famous geographer of the ancient world. He worked in Alexandria in the 2nd Century A.D., in the greatest library of the ancient world. He had at his command all the accumulated geographical information of that world. He was acquainted with mathematics. He shows, in his great work, the *Geographia* (168), a modern scientific mentality. Can we lightly assume that medieval sailors of the *fourteenth century*, without any of this knowledge, and without modern instruments except a rudimentary compass—and without mathematics—could produce a more scientific product?

Nordenskiöld felt that there had been in antiquity a geographic tradition superior to the one represented by Ptolemy. He thought that the "normal portolano" must have been in use *then* by sailors and navigators, and he answered the objection that there was no mention of such maps by the various classical writers by pointing out that in the Middle Ages, when the portolan charts were in use, they were never referred to by the Schoolmen, the academic scholars of that age. Both in ancient and in medieval times the academic mapmaker and the practical navigator were apparently poles apart. (See Figs. 5, 6, 7, 8.) Nordenskiöld was forced to leave the problem unsolved. Neither the medieval navigators nor the known Greek geographers could have drawn them. The evidence pointed to their origin in a culture with a higher level of technology than was attained in medieval or ancient times.[4]

All the explanations of the origins of the portolan charts were opposed by Prince Youssouf Kamal, a modern Arab geographer, in rather violent language:

> Our incurable ignorance . . . as to the origin of the portolans or navigation charts known by this name, will lead us only from twilight into darkness. Everything that has been written on the history or the origin of these charts, and everything that will be said or written hereafter can be nothing but suppositions, arguments, hallucinations. . . . (107:2)[5]

Prince Kamal also argued against the view that the lines on the charts were intended to facilitate navigation by the compass:

> As for the lines that we see intersecting each other, to form lozenges, or triangles, or squares: these same lines, I wish to say, dating from ancient Greek times, and going back to Timosthenes, or even earlier, were probably never drawn . . . to give . . . distances to the navigator. . . .
>
> The makers of portolans preserved this method, that they borrowed from the

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[4] **The Arabs, famous for their scientific achievements in the Early Middle Ages, apparently could not have drawn them either. Their maps are less accurate than those of Ptolemy. (See Fig. 5.)**

[5] **My translation from the French.**

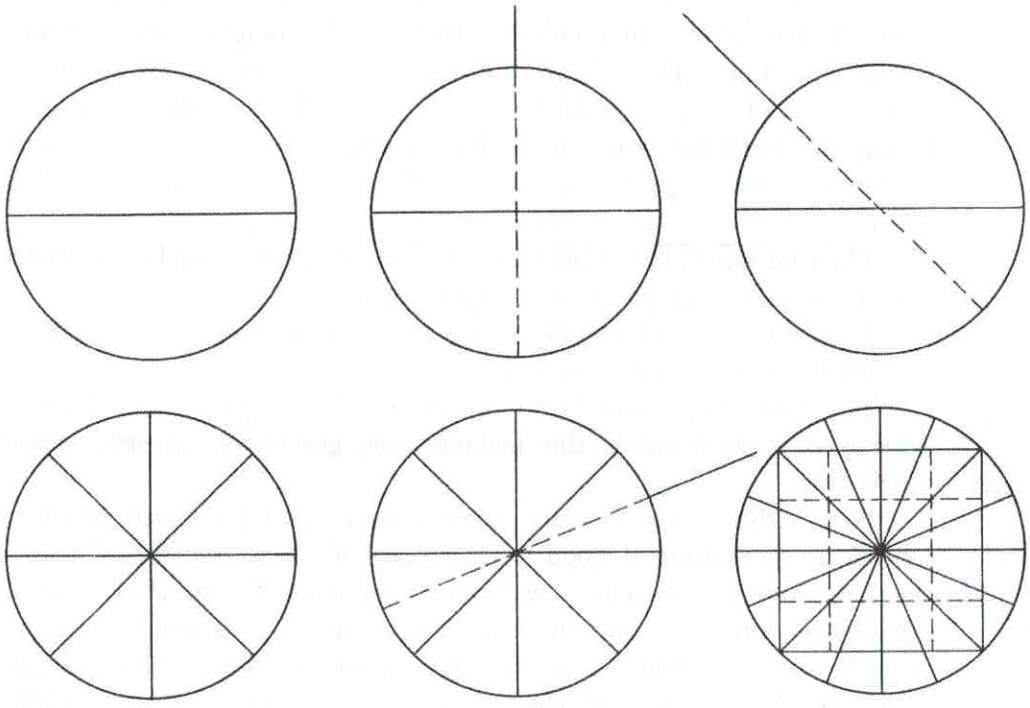

Figure 9. The Eight-Wind System in the Portolan Charts.

Rectangular grids could be constructed with the circular or polar type of projection used in the Piri Re'is and other portolan charts. In this diagram we see how Livengood, Estes, and Woitkowski solved the problem of the construction of the main grid of the Piri Re'is Map (see Fig. 12). (Redrawn by Isroe)

ancient Greeks or others, more probably and rather to facilitate the task of drawing a map, rather than to guide the navigator with such divisions. . . . (107:15–16)

In other words, the portolan design was an excellent design to guide a mapmaker either in constructing an original map or in copying one, because of the design's geometrical character.

Early in our investigation, three of my students, Leo Estes, Robert Woitkowski, and Loren Livengood, decided to take this question—the purpose of the lines on the portolan charts—as their special project. They journeyed to Hanover, New Hampshire, to inspect the medieval charts in the Dartmouth College Library. On their return, one of them, Loren Livengood, said he thought he knew how the charts had been constructed.

The problem was to find out, from the lines actually found on the charts, whether it might be possible to construct a grid of lines of latitude and longitude such as are found on modern maps. In other words, the problem was to see if this portolan system could be *converted* to the modern one.

Livengood's approach was simple. Without actually realizing the importance

of his choice, he put himself in the position of a mapmaker rather than of a navigator. That is, he saw the problem not as one of finding a harbor, but of actually constructing a map. He had never heard of Prince Kamal, but he was adopting the Prince's view of the purpose of the lines. The probable procedure of the mapmaker, Livengood speculated, was first to pick a convenient center for his map and then determine a radius long enough to cover the area to be mapped. With this center and radius the mapmaker would draw a circle.

Then he would bisect his circle, again and again, until he had sixteen lines from the center to the periphery at equal angles of 22½°.[6]

The third step would be to connect points on the perimeter to make a square, with four different squares possible.

The fourth step would be to choose one of the squares, and draw lines connecting the opposite points, thus making a map grid of lines at right angles to each other. (Fig. 9)

Now, although the scholars agreed that the portolan charts had no lines of latitude and longitude, it stood to reason that if one of the vertical lines (such as the line through the center) was drawn on True North, then it would be a meridian of longitude, and any line at right angles to it would be a parallel of latitude. Assuming that a projection similar to the famous Mercator projection, in which all meridians and parallels are straight lines crossing at right angles, underlay these maps (see Fig. 10), then all parallel vertical lines would be meridians of longitude, and all horizontal lines would be parallels of latitude.[7]

Applying this idea to the Piri Re'is Map, we could see that the mapmaker had selected a center, which he had placed somewhere far to the east of the torn edge of our fragment of the world map,[8] and had then drawn a circle around it. He had bisected the circle four times, drawing sixteen lines from the center to the perimeter, at angles of 22½°, and he had also drawn in all the four possible squares, perhaps with the intention of using different squares for drawing grids for different parts of the map, where it might be necessary to have different Norths.[9]

It gets a little technical as Hapgood describes taking the Piri Re'is map & converting it to one drawn using our modern system of latitude & longitude.

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[6] These angles could also be bisected, if desired, resulting in thirty-two points on the periphery, at angles of 11¼°.

[7] See Note 4 and Note 5.

[8] The complete map included Africa and Asia. It was, according to Piri Re'is, a map "of the seven seas" (see Note 3). In addition to the loss of the eastern part, there was also originally a northern section, which was detached and lost. I am indebted to Dr. Alexander Vietor, of Yale, for this observation.

[9] Since the earth is round, and the portolan design was apparently based on a flat projection (that is, apparently on plane geometry) which could not take account of the spherical surface, the parallel meridians would deviate further and further from True North the farther they were removed from the center of the map. The portolan design could compensate for this, however, as we shall see in the next chapter, by using different Norths.

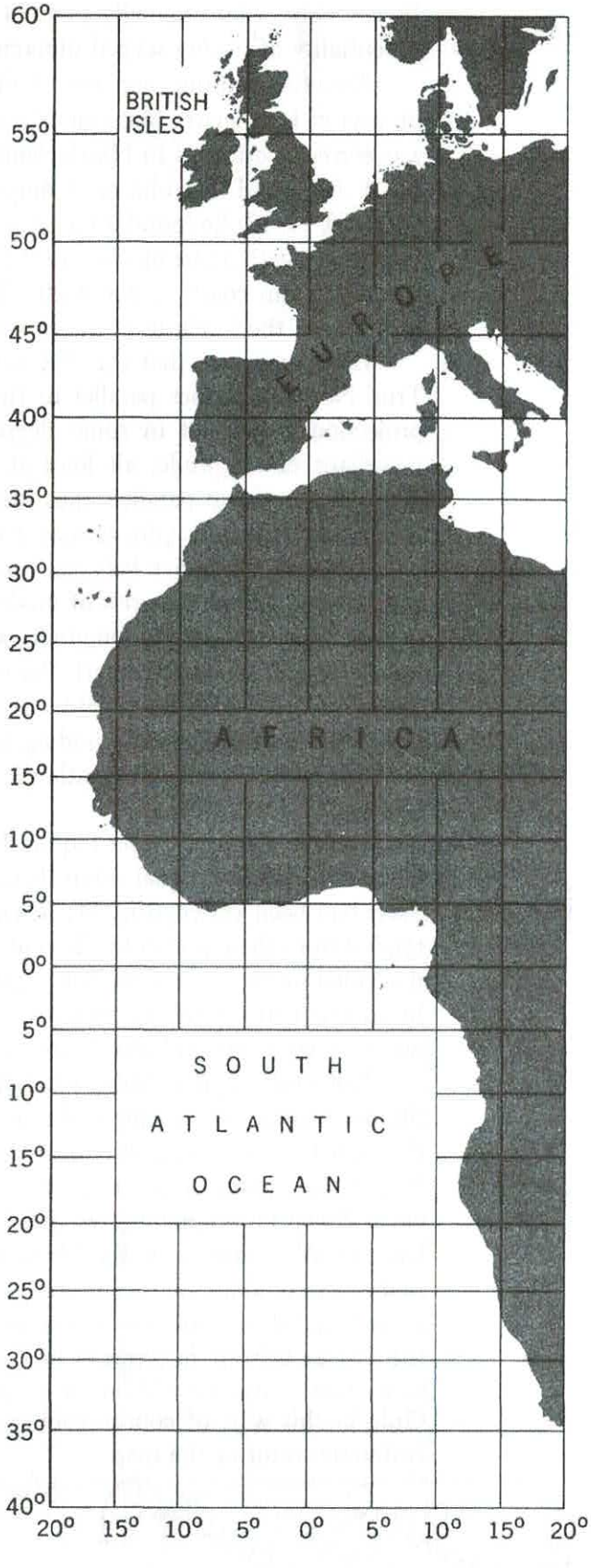

Figure 10. A Map of the eastern shores of the Atlantic on the Mercator Projection.

Compare the meridian of 20° West Longitude with the "Prime Meridian" of the Piri Re'is Map (Fig. 18).

It was Estes who originally pointed out to us that the portolan design had the potentiality of having several different Norths on the same map.

Now the next question was: Which was the right square for us? That is, which (if any) of the squares that could be made out of the design of the Piri Re'is Map was correctly oriented to North, South, East, and West?

Estes found the solution. Comparing the Piri Re'is Map with a modern map (Figs. 10, 11, 12) he found a meridian on the modern map that seemed to coincide very nearly with a line on the Piri Re'is Map—a line running north and south close to the African coast, in about 20° W longitude, leaving the Cape Verde Islands to the west, the Canaries to the east, and the Azores to the west.

Estes suggested that this line might be our prime meridian, a line drawn on True North. All lines parallel to this (assuming, of course, that the underlying projection resembled in some degree the Mercator projection) would also be meridians of longitude; all lines at right angles would be parallels of latitude. The meridians and parallels thus identified, provisionally, on the Piri Re'is Map, formed a rectangular grid, as shown in Fig. 12.

The only difference between this large rectangular grid actually found on the Piri Re'is Map and the grids of modern maps was that the latter all carry registers of degrees of latitude and longitude, with parallels and meridians at equal intervals, usually five or ten degrees apart. We could convert the Piri Re'is grid into a modern grid if we could find the precise latitudes and longitudes of its parallels and meridians. This, we found, meant finding the exact latitude and longitude of each of the five projection centers in the Atlantic Ocean, through which the lines of Piri Re'is' grid ran.

At the beginning of our inquiry I had noticed that these five projection centers had been placed at equal intervals on the perimeter of a circle, though the circle itself had been erased (Fig. 11). I had also noticed that converging lines were extended from these points to the center, beyond the eastern edge of the map. This, it seemed to me at the time, was a geometrical construction that should be soluble by trigonometry. I did not then know that, in the opinion of all the experts, there was no trigonometrical foundation to the portolan charts.

Not knowing that there was not supposed to be any mathematical basis for the portolanos, we now made the search for it our main business. I realized from the start that to accomplish this we would have to discover first the precise location of the center of the map, and then the precise length of the radius of the circle drawn by the mapmaker. I was fortunate in having a mathematician friend, Richard W. Strachan, at the Massachusetts Institute of Technology. He told me that, if we could obtain this information for him, he might be able, by trigonometry, to find the precise positions of the five projection points in the Atlantic Ocean on the Piri Re'is Map, in terms of modern latitude and longitude. This would enable us to draw a modern grid on the map, and thus check every detail of it accurately. Only in this way, of course, could we verify the claim of Mallery regarding the Antarctic sector of the map.

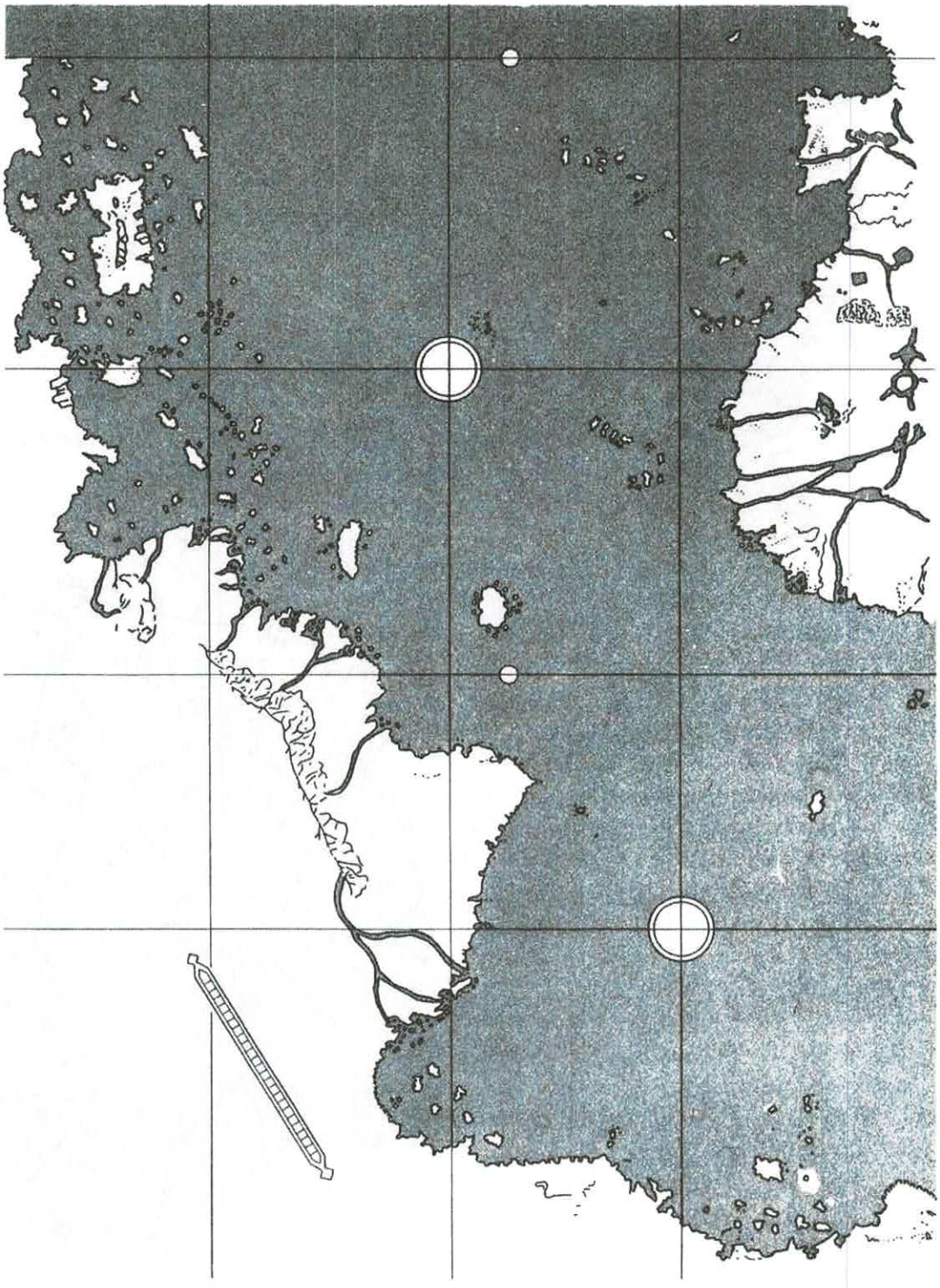

Figure 12. The Piri Re'is Map: the Main Grid of the Portolan Design traced from the facsimile.

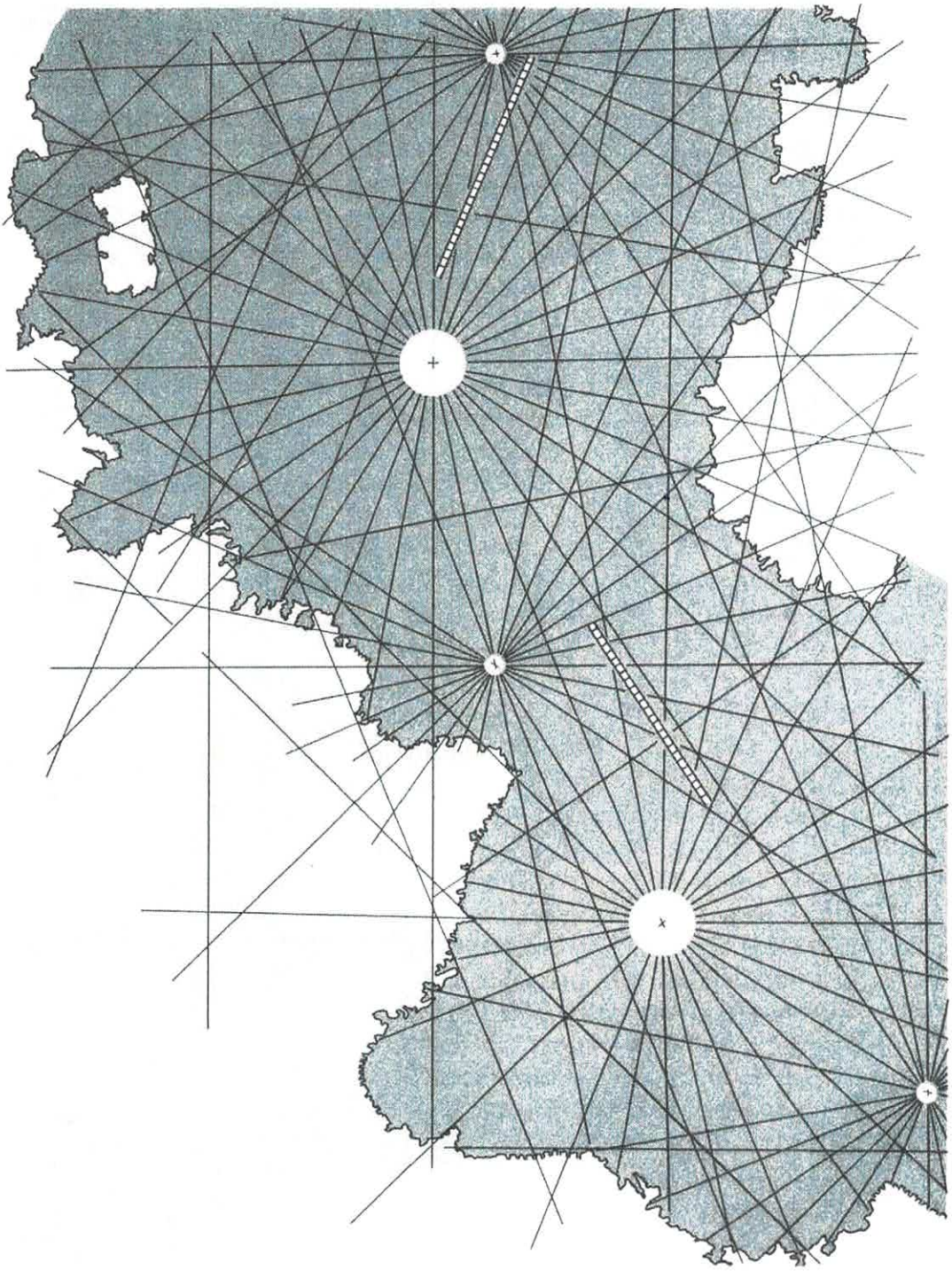

Figure 11. The Piri Re'is Map: the lines of the Portolan Design traced from the facsimile.

The search for the center of the map lasted about three years. We thought from the beginning that the lines extending from the five projection points probably met in Egypt. We used various methods to project the lines to the point where they would meet. Our first guess for the center of the map was the city of Alexandria. This appealed to me because Alexandria was long the center of the science and learning of the ancient world. It seemed likely that, if they were drawing a world map, the Alexandrian geographers might naturally make their own city its center.

However, this guess proved to be wrong. A contradiction appeared. The big wind rose in the North Atlantic looked as if it were meant to lie on the Tropic of Cancer. One of the lines from this center evidently was directed toward the center of the map. But we noticed that this line was at right angles to our prime meridian. This meant, of course, that it was a parallel of latitude. Now, the Tropic of Cancer is at 23½° North Latitude, and therefore the parallel from the wind rose would reach a center in Egypt at 23½° North. But Alexandria is not at that latitude at all. It lies in 31° North. Therefore Alexandria could not be the center of our circle.

We looked at the map of ancient Egypt to find, if we could, a suitable city on the Tropic of Cancer that might serve as a center for the map. (We were still attached to the idea that the center of our map should be some important place, such as a city. Later, we were emancipated from this erroneous notion.)

Looking along the Tropic of Cancer, we found the ancient city of Syene, lying just north of the Tropic, near the present city of Assuan, where the great dam is being built. Now we recalled the scientific feat of Eratosthenes, the Greek astronomer and geographer of the 3rd Century B.C., who measured the circumference of the earth by taking account of the angle of the sun at noon as simultaneously observed at Alexandria and at Syene.

We were happy to change our working theory and adopt Syene as the center of the map. With the help of hindsight, we could now see how reasonable it was to place the center of the map on the Tropic, an astronomically determined line on the surface of the earth. The poles, the tropics, and the equator can be exactly determined by celestial observations, and they have been the bases of mapmaking in all times. Syene, too, was an important city, suitable for a center. A good "proof" of this center for the map was constructed by two students, Lee Spencer and Ruth Baraw. Only at the end of our inquiry did we find that Syene was not, after all, exactly the center.

The matter of the radius caused us much more trouble. At first, there appeared to be absolutely no way of discovering its precise length. However, some of my students started talking about the Papal Demarcation Line—the line drawn by Pope Alexander VI in 1493, and revised the next year, to divide the Portuguese from the Spanish possessions in the newly discovered regions (Fig. 13). On the Piri Re'is Map there was a line running north and south, passing through the

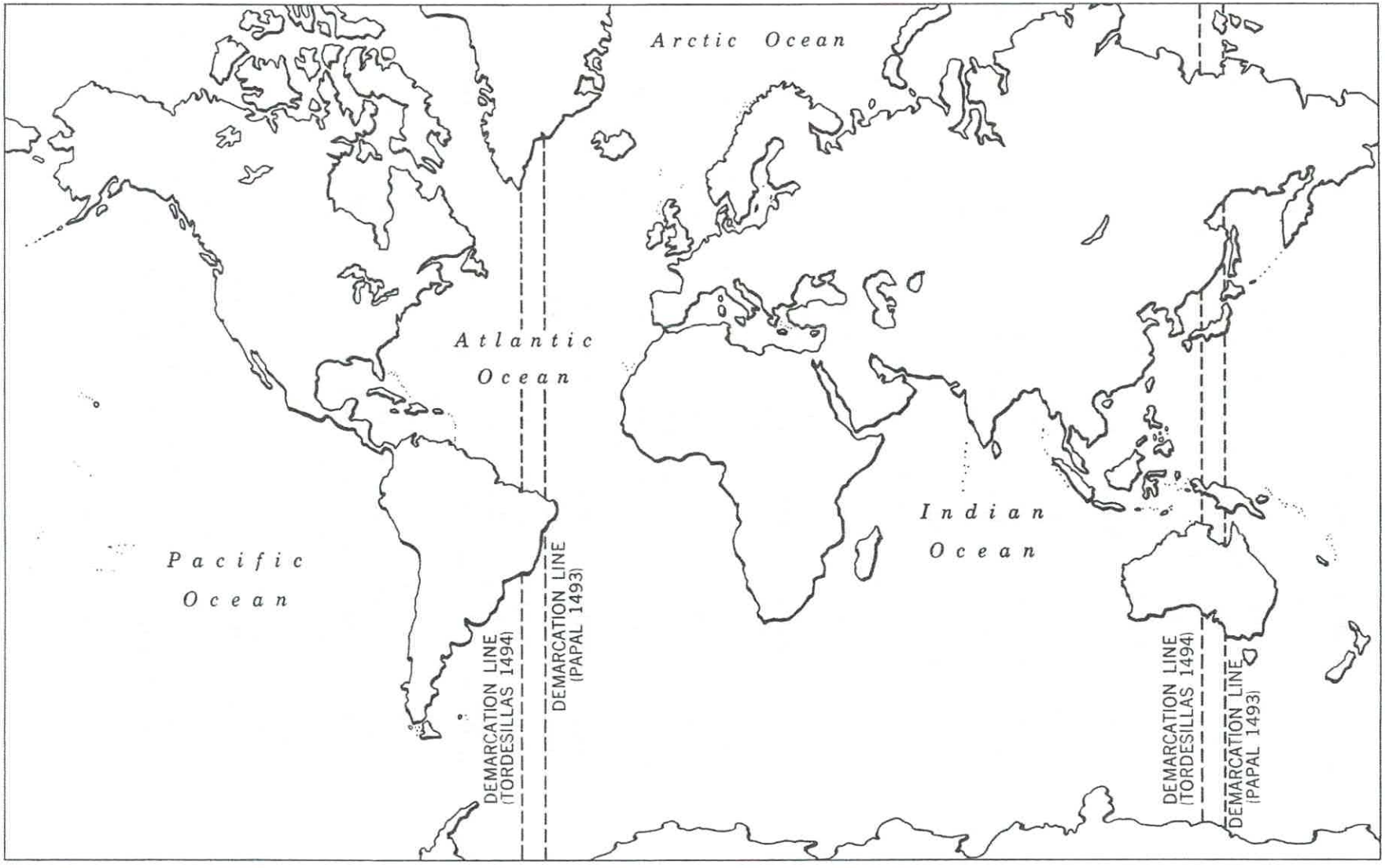

Figure 13. The Papal Demarcation Lines of 1493 and 1494.

northern wind rose and then through Brazil at a certain distance west of the Atlantic coast. This line appeared to be identical, or nearly identical, with the Second Demarcation Line (of 1494), which also passed through Brazil. Piri Re'is had mentioned the Demarcation Line on his map, and we reached the conclusion that this line, if it was the Demarcation Line, could give us the longitude of the northern wind rose and thus the length of the radius of the circle with its center at Syene.

The Papal Demarcation Line of 1494 is supposed to have been drawn north and south at a distance of 370 leagues west of the Cape Verde Islands. Modern scholars have calculated that it was at 46° 30′ West Longitude (140:369). We therefore assigned this longitude to the northern wind rose, and thus obtained our first approximate guess as to the length of the radius of the circle. According to this finding the radius was 79° in length (32½ plus 46½). This result was wrong by 9½°, as we later discovered, but it was close enough for a starter.

At this stage, our findings were too uncertain to justify an attempt to apply trigonometry to the problem. Instead, we tested our results directly on an accurate globe provided by Estes. We made our test by actually drawing a circle, with Syene as the center, and the indicated radius, and then laying out the lines from the center to the perimeter, 22½° apart, beginning with one to the equator. The result seemed pretty good, and we were sure we were on the right track.

It was lucky that we got so far before we discovered that our interpretation of the Demarcation Line on the map was wrong. This fact was finally brought home to us by two other students, John F. Malsbenden and George Batchelder (Fig. 14). They had been bending over the map during one of our long night sessions[10] when suddenly Malsbenden straightened up and exclaimed indignantly that all our work had been wasted, that the line we had picked out was not the right one. In an inscription on his map which we had overlooked Piri Re'is had himself indicated an entirely different line. It was the first line, the line of 1493, and it did not go through the wind rose at all. The mistake, however, had served its purpose. It was true enough that the line we had picked out on the Piri Re'is Map represented neither line; nevertheless it was close enough to the position of the Demarcation Line of 1494 to give us a first clue to the longitude.

Another error that turned out to be very profitable was the assumption we made, during a certain period of time, that perhaps our map was oriented not to True North, but to Magnetic North. Later, we were to find that many, if not most, of the portolanos were indeed oriented, very roughly, to Magnetic North. Some writers on the subject had argued, as already mentioned, that the lines on the portolan charts were intended only for help in finding compass directions, and were therefore necessarily drawn on Magnetic North.[11]

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[10] Interest in the map was so keen that the students would come to my apartment in the evening, and sometimes argue until the small hours.

[11] See the Bibliography, Nos. 89, 116, 143, 179, 199, 200, 223.

Figure 14. An argument over the Piri Re'is Map: left to right, Leo Estes, Frank Ryan, Charles Hapgood, Clayton Dow, John Malsbenden, George Batchelder.

In the interest of maximum precision, I wanted to find out how the question of Magnetic North might affect the longitude of the Second Demarcation Line, which now determined our radius. If the Demarcation Line lay at 46° 30′ West Longitude at the Cape Verde Islands, it would, with a magnetic orientation, lie somewhat farther west at the latitude of the northern wind rose, and this would affect the radius. We spent time trying to calculate how much farther west the line would be. This in turn involved research to discover the amount of the compass declination (the difference between True and Magnetic North) today in those parts of the Atlantic, and speculation as to what might have been the amount of the variation in the days of Piri Re'is or in ancient times. We found ourselves in a veritable Sargasso Sea of uncertainties and frustrations.

Fortunately, we were rescued from this dead end by still another wrong idea. I noticed that the circle drawn with Syene as a center, and with a radius to the intersection of the supposed Second Demarcation Line with the northern wind rose, appeared to pass through the present location of the Magnetic Pole. We then allowed ourselves to suppose (nothing being impossible) that somebody in ancient times had known the location of the Magnetic Pole and had deliberately selected a radius that would pass through it. Shaky as this assumption might have been, it was at least better than the Demarcation Line, since in ancient times

nobody could have had an idea of a line that was only drawn in 1494 A.D. The Magnetic Pole is, however, very unsatisfactory as a working assumption because it does not stay in one place. It is always moving, and where it may have been in past times is anybody's guess.

In the middle of this I read Nordenskiöld's statement that the portolan charts were drawn on True North, and not on Magnetic North (146:17). In this Nordenskiöld was really mistaken, unless he meant that the charts had *originally* been drawn on True North and then had been *reoriented* in a magnetic direction. But his statement impressed us, and then I observed, looking again at the globe with our circle drawn on it, that the circle that passed through the Magnetic Pole also passed very close indeed to the True Pole. Now, you may be sure, we abandoned our magnetic theory in a hurry, and adopted the working assumption that perhaps someone in ancient times knew the true position of the Pole, and drew his radius from Syene on the Tropic of Cancer to the Pole. Again, hindsight came to our support. As in the case of the Tropic of Cancer, the Pole was astronomically determined: It was a precisely located point on the earth's surface.

It appeared to us that we had swum through a murky sea to a safe shore. We had now reached a point where it would be feasible to attempt a confirmation of the whole theory by trigonometry. We were proceeding now on the following asumptions: (1) The center of the projection was at Syene, on the Tropic of Cancer and at longitude 32½° East; (2) the radius of the circle was from the Tropic to the Pole, or 66½° in length, and (3) the horizontal line through the middle projection point on the map (Point III) was the true equator. By comparison with the African coast of the Gulf of Guinea, this line, indeed, appears to be very close to the position of the equator. Nevertheless, this was not merely an assumption but also guesswork. We could not *know*, either, that the ancient mapmaker had precise information as to the size of the earth, which would be necessary for correctly determining the positions of the poles and the equator. Such assumptions could be only working assumptions, to be used for purposes of experiment and discarded if they proved wrong. They were, however, the best assumptions we had been able to come up with so far, and assumptions we had to have to work with.

We could now give our mathematician, Strachan, the data he required for a mathematical analysis. He calculated the positions of all the five projection centers on the Piri Re'is Map to find their precise locations in latitude and longitude.[12] He used our assumed equator as his base line of latitude. I have tried to explain this in Fig. 15. Here I have drawn the first radius from the center of the projection to the point of intersection of the assumed equator with the perimeter of the circle. I then have laid out the other radii at angles of 22½° northward and south-

[12] **For the final determinations of these positions see Figure 18. For the calculations see Appendix.**

ward. In this way, our assumption that this equator is precisely correct controls the latitudes to be found for the other four projection points. The assumed equator is the base line for latitude, just as Syene is the reference point for longitude.

Strachan initially computed the positions of the five projection points both by spherical and by plane trigonometry. At each successive step, with varying assumptions as to the radius of the projection and the position of its center, he did the same thing, but in every case the calculations by plane trigonometry made

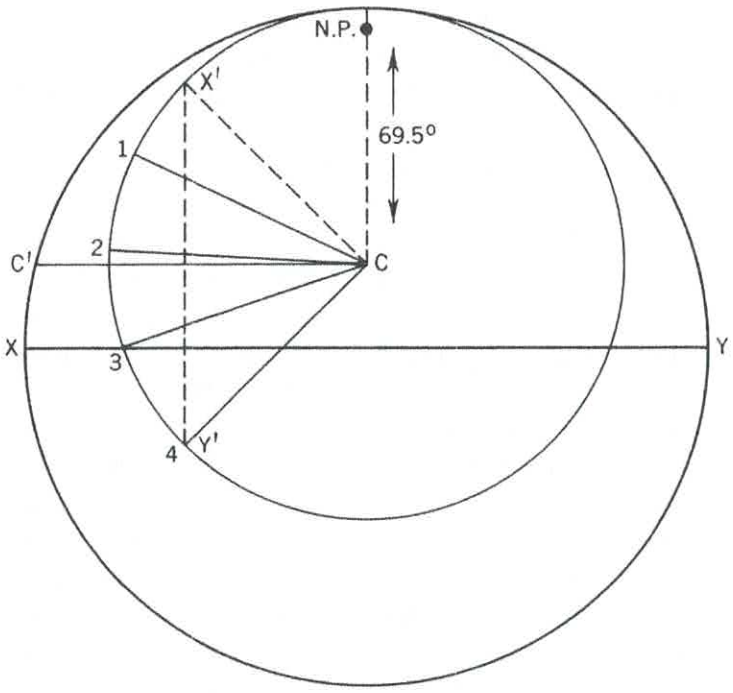

Figure 15. A diagram of the hypothetical Piri Re'is projection, as based on the equator.

sense—that is, plane trigonometry made it possible to construct grids that fitted the geography reasonably well, while the calculations by spherical trigonometry led to impossible contradictions. It became quite clear that our projection had been constructed by plane trigonometry.[13]

Once we had precise latitudes and longitudes for the five centers on the Piri Re'is map, we could construct a modern type of grid. The total difference of latitude between Point I and Point V, divided by the millimeters that lay between them on our copy of the map (we used a tracing of our photograph of the map), gave us the length of the degree of latitude in millimeters. To check on any possible irregularities we measured the length of the degree of latitude separately

[13] See Note 6 for a comparison of the results in one case.

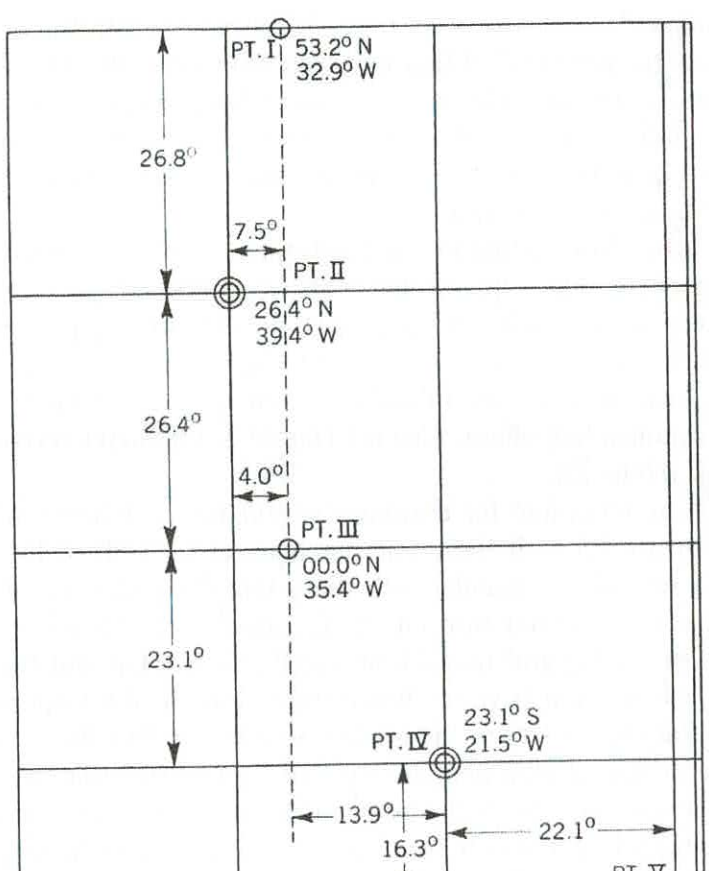

Figure 16. Mode of calculating the length of the degree for the Piri Re'is Map.

between each two of the five points. We followed the same procedure with the longitude, as illustrated in Fig. 16. The lengths of the degrees of latitude and longitude turned out to be practically the same; we thus appeared to have a square grid. In doing this we disregarded the scales actually drawn on the map, since there was no way of knowing when or by whom they had been drawn, or what units of distance they had represented.

The next step was to learn how to draw a grid, not at all an easy task. It was not a particularly complicated task, but it demanded a very high level of accuracy and an extreme degree of patience. Fortunately, one of my students, Frank Ryan, was qualified for the job. He had served in the Air Force, had been stationed at Westover Air Force Base in Massachusetts, and had been assigned to the Cartographic Section of the 8th Reconnaissance Technical Squadron, under a remarkable officer, Captain Lorenzo W. Burroughs. The function of the unit at that time was to prepare maps for the use of the United States Air Force's Strategic Air

Command, known as SAC. Later, it was attached to the 8th Air Force. Needless to say, the personnel of that unit were competent to serve the demanding requirements of the Air Force, as far as mapmaking was concerned, and Frank Ryan had been intensively trained in the necessary techniques. He had had the experience of being drafted into the Air Force: now he had the experience of being drafted again, to draw our grid.

Later Ryan introduced me to Captain Burroughs, and I visited Westover Air Force Base. The captain offered us his fullest cooperation in preparing a draft map with the solution of the projection, and virtually put his staff at our disposal. The co-operation between us lasted more than two years, and a number of officers and men gave us very valuable assistance.[14] Later both Captain Burroughs and his commanding officer, Colonel Harold Z. Ohlmeyer reviewed and endorsed our work (Note 23).

The procedure for drawing the grid was as follows: All the meridians were drawn parallel with the prime meridian, at intervals of five degrees, and all parallels were drawn parallel with the assumed equator, at intervals of five degrees. These lines did not turn out in all cases to be precisely parallel with the other lines of the big grid traced from the Piri Re'is Map, but this was understandable. The effect might have resulted from warping of the map, or from carelessness in copying the lines from the ancient source map Piri Re'is used. We had to allow for a margin of error here, for we could not be sure that no small errors had crept in when the equator or the prime meridian was recopied. Here, as in other respects, we simply had to do the best we could with what we had.[15]

When the grid was drawn, we were ready to test it. We identified all the places we could on the map and made a table comparing their latitudes and longitudes on the Piri Re'is Map with their positions on the modern map. The errors in individual positions were noted and averages of them made (Table 1). The Table is, of course, the test of our solution of the Piri Re'is projection.

But I must not get ahead of my story. We found that some of the positions on the Piri Re'is Map were very accurate, and some were far off. Gradually we became aware of the reasons for some of the inaccuracies in the map. We discovered that the map was a composite, made up by piecing together many maps of local areas (perhaps drawn at different times by different people), and that errors had been made in combining the original maps. There was nothing extraordinary about this. It would have been an enormous task, requiring large amounts of money, to survey and map all at once the vast area covered by the Piri Re'is Map. Undoubtedly local maps had been made first, and these were gradually combined, at different times, into larger and larger maps, until finally a world map was attempted. This long process of combining the local maps, so far as the sur-

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[14] **See Acknowledgments.**

[15] **See also Strachan's discussion, Note 8.**

viving section of the Piri Re'is Map is concerned, had been finished in ancient times. This theory will, I believe, be established by what follows. What Piri Re'is apparently did was to combine this compilation with still other maps—which were probably themselves combinations—to make his world map.

The students were responsible for discovering many of the errors. Lee Spencer and Ruth Baraw examined the east coast of South America with great care and found that the compiler had actually omitted about 900 miles of that coastline. It was discovered that the Amazon River had been drawn twice on the map. We concluded that the compiler must have had two different source maps of the Amazon, drawn by different people at different times, and that he made the mistake of thinking they were two different rivers. We also found that besides the equator upon which we had based our projection (so far as latitude was concerned) there was evidence that somebody had calculated the position of the equator differently, so that there were really two equators. Ultimately we were able to explain this conflict. Other important errors included the omission of part of the northern coast of South America, and the duplication of a part of that coast, and of part of the coasts of the Caribbean Sea. A number of geographical localities thus appear twice on the map, but they do not appear on the same projection. For most of the Caribbean area the direction of North is nearly at right angles to the North of the main part of the map.

As we identified more and more places on our grid, and averaged their errors in position, we found all over the map some common errors that indicated something was wrong with the projection. We concluded that there must still be errors either in the location of the center of the map, in the length of the radius, or both. There was no way to discover these probable errors except by trying out all reasonable alternatives by a process of trial and error. This was time consuming and a tax on the patience of all of us. With every change in the assumed center of the map, or in the assumed radius, Strachan had to repeat the calculations, and once more determine the positions of the five projection points. Then the grid had to be redrawn and all the tables done over. As each grid in turn revealed some further unidentified error, new assumptions had to be adopted, to an accompaniment of sighs and groans. We had the satisfaction, however, of noting a gradual diminution of the errors that suggested that we were approaching our goal.

Among the various alternatives to Syene as the center of the map we tried out, at one stage, the ancient city of Berenice on the Red Sea. This was the great shipping port for Egypt in the Alexandrian Age, and it, too, lay on the Tropic of Cancer. Berenice seemed to be a very logical center for the map because of its maritime importance. We studied the history of Berenice, and everything seemed to point to this place as our final solution. But then, as in an Agatha Christie murder mystery, the favorite suspect was proved innocent. The tables showed the assumption to be wrong, for in this case the errors were even increased. We had

to give up Berenice, with special regrets on my part because of the beauty of the name.

Now we went back to Syene, but with a difference. The tables showed that the remaining error in the location of the center of the map was small. Therefore we tried out centers near Syene, north, east, south and west, gradually diminishing the distances, until at last we used the point at the intersection of the meridian of Alexandria, at 30° East Longitude, with the Tropic. This finally turned out to be correct.

Immediately hindsight began to make disagreeable comments. Why hadn't we thought of this before? Why hadn't we tumbled to this truth in the beginning? It combined all the most reasonable elements: the use of the Tropic, based on astronomy, and the use of the meridian of Alexandria, the capital of ancient science. Later we were to find that all the Greek geographers based their maps on the meridian of Alexandria.

Remaining errors in the tables suggested something wrong with the radius. We knew, of course, that our assumption that the mapmaker had precise knowledge of the size of the earth was doubtful. It was much more likely that he had made some sort of mistake. We therefore tried various lengths. We shortened the radius a few degrees, on the assumption that the mapmaker might have underestimated the size of the earth, as Ptolemy had. This only increased the errors. Then we tried lengthening the radius. The entire process of trial and error was repeated with radii 7°, 5°, 2°, and 1° too long. Finally we got our best results with a radius extended three degrees. This meant that our radius was not 66.5°, the correct number of degrees from the Tropic to the Pole, but 69.5°. This error amounted to an error of 4½ per cent in overestimating the size of the earth.

A matter of great importance, which we did not realize at all at the time, was that we were, in fact, finding the length of the radius (and therefore the length of the degree) with reference mainly to longitude. I paid much more attention to the average errors of longitude than I did to the errors of latitude. I was especially interested in the longitudes along the African and South American coasts. Our radius was selected to reduce longitude errors to a minimum while not unduly increasing latitude errors. As it turned out, this emphasis on longitude was very fortunate, for it was to lead us to a later discovery of considerable importance.

With regard to the overestimating of the circumference of the earth, there was one geographer in ancient times who made an overestimate of about this amount. This was Eratosthenes. Does this mean that Eratosthenes himself may have been our mapmaker? Probably not. We have seen that the Piri Re'is Map was based on a source map originally drawn with plane trigonometry. Trigonometry may not have been known in Greece in the time of Eratosthenes. It has been supposed that it was invented by Hipparchus, who lived about a century later.

Hipparchus discovered the precession of the equinoxes, invented or at least described mathematical map projections, and is generally supposed to have developed both plane and spherical trigonometry (58:49; 175:86).[16] He accepted Eratosthenes' estimate of the size of the earth (184:415) though he criticized Eratosthenes for not using mathematics in drawing his maps.

We must interfere in this dispute between Hipparchus and Eratosthenes to raise an interesting point. Did Hipparchus criticize his predecessor for not using mathematically constructed projections on which to place his geographical data? If so, his criticism looks unreasonable. The construction of such projections requires trigonometry. If Hipparchus himself developed trigonometry, how could he have blamed Eratosthenes for not using it a century before? Hipparchus' own books have been lost, and we really have no way of knowing whether the later writers who attributed trigonometry to Hipparchus were correct. Perhaps all they meant, or all *he* meant or said in his works, was that he had *discovered* trigonometry. He might have discovered it in the ancient Chaldean books whose star data made it possible for him to discover the precession of the equinoxes.

But this is speculation, and I have a feeling that it is very much beside the point. If Hipparchus did in fact develop both plane and spherical trigonometry, the Piri Re'is Map, and the other maps to be considered in this book, are evidence suggesting that he only rediscovered what had been very well known thousands of years earlier. Many of these maps must have been composed long before Hipparchus. But it is not possible to see how they could have been drawn as accurately as they were unless trigonometry was used. (See Note 7.)

We have additional confirmation that the Piri Re'is projection was based on Eratosthenes' estimate of the size of the earth. The Greeks had a measure of length, which they called the stadium. Greek writers, therefore, give distances in stadia. Our problem has been that they never defined this measure of length. We have no definite idea, therefore, of what the stadium was in terms of feet or meters. Estimates have varied from about 350 feet to over 600. Further, we have no reason to even suppose that the stadium had a standard length. It may have differed in different Greek states and also from century to century.

A great authority on the history of science, the late Dr. George Sarton of Harvard, devoted much attention to trying to estimate the length of the stadium used by Eratosthenes himself at Alexandria in the 3rd Century B.C. He concluded that the "Eratosthenian stadium" amounted to 559 feet (184:105).[17]

The solution of the Piri Re'is projection has enabled us to check this.

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[16] However, a knowledge of plane trigonometry has been attributed to Appolonius, an earlier Greek scientist, by Van der Waerden (216). The date of its origin appears, then, unknown.

[17] That is, there were about 9.45 Eratosthenian stadia to a mile of 5,280 feet, which figures out to 558.88 feet per stadium.

Presumably, it proves the amount of the overestimate of the earth's circumference to be 4½ per cent (or very nearly that). Eratosthenes gave the circumference of the earth as 252,000 stadia. We checked the length of his stadium by taking the true mean circumference of the earth (24,800 miles), increasing this by 4½ per cent, turning the product into feet, and dividing the result by 252,000. We got a stadium 547 feet long.

Now, if we compare our result with that of Sarton, we see that there is a difference of only 12 feet, or about 2 per cent. It would seem—again by hindsight—that we could have saved all our trouble by merely adopting Eratosthenes' circumference and Sarton's stadium. We could then have drawn a grid so nearly like the one we have that the naked eye could not have detected the difference.

The next stage, which came very late, was our realization that if Eratosthenes' estimate of the circumference of the earth was used for drawing Piri Re'is' source map, and if it was 4½ per cent off, then the positions we had found by trigonometry for the five projection points on the map were somewhat in error both in latitude and longitude. It was now necessary to redraw the whole grid to correct it for the error of Eratosthenes. We found that this resulted in reducing all the longitude errors until they nearly vanished.

This was a startling development. It could only mean that the Greek geographers of Alexandria, when they prepared their world map using the circumference of Eratosthenes, had in front of them source maps that had been drawn *without the Eratosthenian error*, that is, apparently without any discernible error at all. We shall see further evidence of this, evidence suggesting that the people who originated the maps possessed a more advanced science than that of the Greeks.

But now another perplexing problem appeared. The reduction of the longitude errors left latitude errors that averaged considerably larger. Since accurate longitude is much more difficult to find than accurate latitude, this was not reasonable. There had to be some further undetected error in our projection.

We started looking for this error, and we found one. That is, we found an error. It was not quite the right one; it did not solve our problem, but it helped us on the way. As already mentioned, we had found the positions of the five projection points by laying out a line first from the center of the projection to the intersection of the circle with the line on the Piri Re'is map running horizontally through the middle projection point, Point III, assuming this to be the equator. We had used this assumed equator as our base line for latitude. (See Fig. 15.)

When we laid out the projection in this way, we had not yet realized that the mapmaker was much more likely to have drawn his first radius from the center of the map directly to the pole and not to the equator. (See Fig. 17.) If he did this, since his length for the degree was wrong, then his equator must be off a number of degrees. This required new calculations, and still another grid.

At first, this new grid seemed to make matters worse, especially on the coast of Africa. The equator seemed to pass too near the Guinea coast by approximately

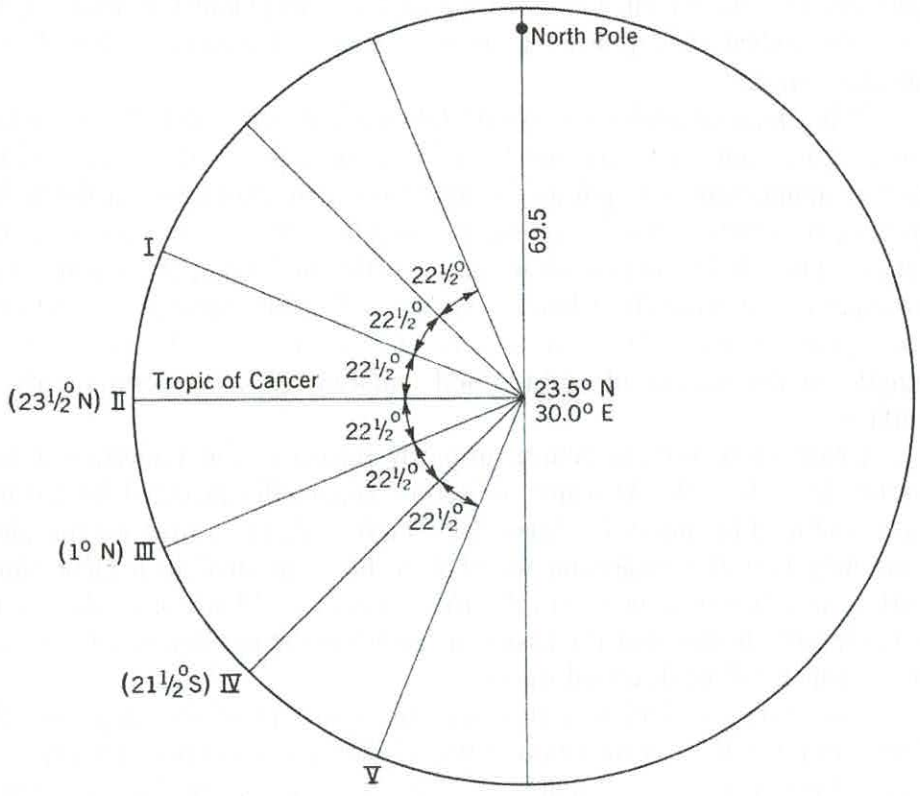


Figure 17. A diagram of the hypothetical Piri Re'is projection as based on the North Pole.

five degrees. My heart sank when this result became apparent, but I am thankful that I persisted in redrawing the grid despite the apparent increase in the errors, for the result was a discovery of the very greatest importance.

At first I thought that the African coast (and that of Europe) had simply been wrongly placed too far south on the projection. But I soon saw that if the African coast appeared too far south on the corrected projection, the French coast was in more correct latitude than before. There was simply, I first concluded, an error in scale. Piri Re'is, or the ancient mapmaker, had used too large a scale for Europe and Africa. But why, in that case, though latitudes were thrown out, did longitudes remain correct?

I finally decided to construct an empirical scale for the whole coast from the Gulf of Guinea to Brest to see how accurate the latitudes were relative to one another. The result showed that the latitude errors along the coasts were minor. It was obvious that the original mapmakers had observed their latitudes extremely well. From this it became apparent that those who had originally drawn this map of these coasts had used a different length for the degree of latitude than for the degree of longitude. In other words, the geographers who designed the square

portolan grid for which we had discovered the trigonometric solution, had apparently applied their projection to maps that had originally been drawn with another projection.

What kind of projection was it? Obviously it was one that took account of the fact that, northward and southward from the equator, the degree of longitude in fact diminished in length as the meridians drew closer toward the poles. It is possible to represent this by curving the meridians, and we see this done on many modern maps. It is also possible to represent this by keeping the meridians straight and spacing the parallels of latitude farther and farther apart as the distance from the equator increases. The essential point is to maintain the ratio between the lengths of the degrees of latitude and longitude at every point on the earth's surface.

Geographers will, of course, instantly recognize the projection I have described here. It is the Mercator projection, supposedly invented by Gerard Mercator and used by him in his Atlas of 1569 (Note 5). For a time we considered the possibility that this projection might have been invented in ancient times, forgotten, and then rediscovered in the 16th Century by Mercator (Note 15). Further investigation showed that the device of spreading the parallels was found on other maps, which will be discussed below.

I was very reluctant to accept without further proof the suggestion that the Mercator projection (in the full meaning of that term) had been known in ancient times. I considered the possibility that the difference in the length of the degree of latitude on the Piri Re'is Map might be *arbitrary*. That is, I thought it possible that the mapmaker, aware of the curvature of the earth, but unable to take account of it as is done in the Mercator projection by spherical trigonometry, had simply adopted a *mean* length for the degree of latitude, and applied this length over the whole map without changing the length progressively with each degree from the equator.

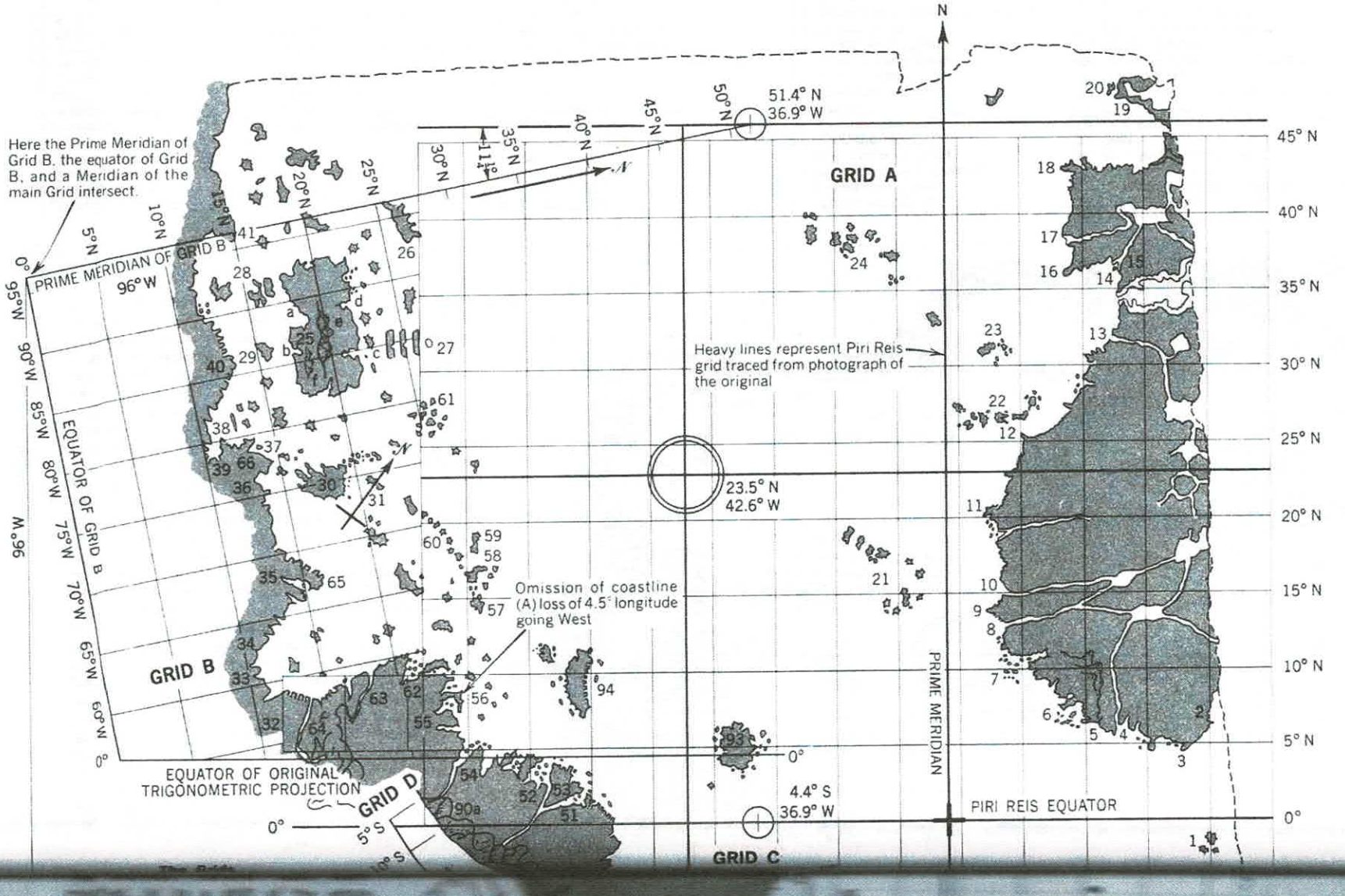
Strangely enough, shortly after this, I found that, according to Nordenskiöld, this is precisely what Ptolemy had done on his maps (see Note 9). In Nordenskiöld's comparison of the maps of the Mediterranean and Black Sea regions as drawn by Ptolemy and as shown on the Dulcert Portolano (Fig. 4), we see that he has drawn the lines of Ptolemy's projection in this way. This is, of course, another indication of the ancient origin of Piri Re'is' source map.

This is not quite the end of the story. We shall see, in subsequent consideration of the De Canerio Map of 1502, that the oblong grid, used by Ptolemy and found on the Piri Re'is Map, has its origin in an ancient use of spherical trigonometry.

These successive discoveries finally enabled us to draw a modern grid for most of the Piri Re'is map, as shown in Figure 18.

THE PIRI RE'IS MAP OF 1513

IN ALL THE WORLD THERE IS NO OTHER MAP LIKE THIS MAP—PIRI RE'IS



The Grids

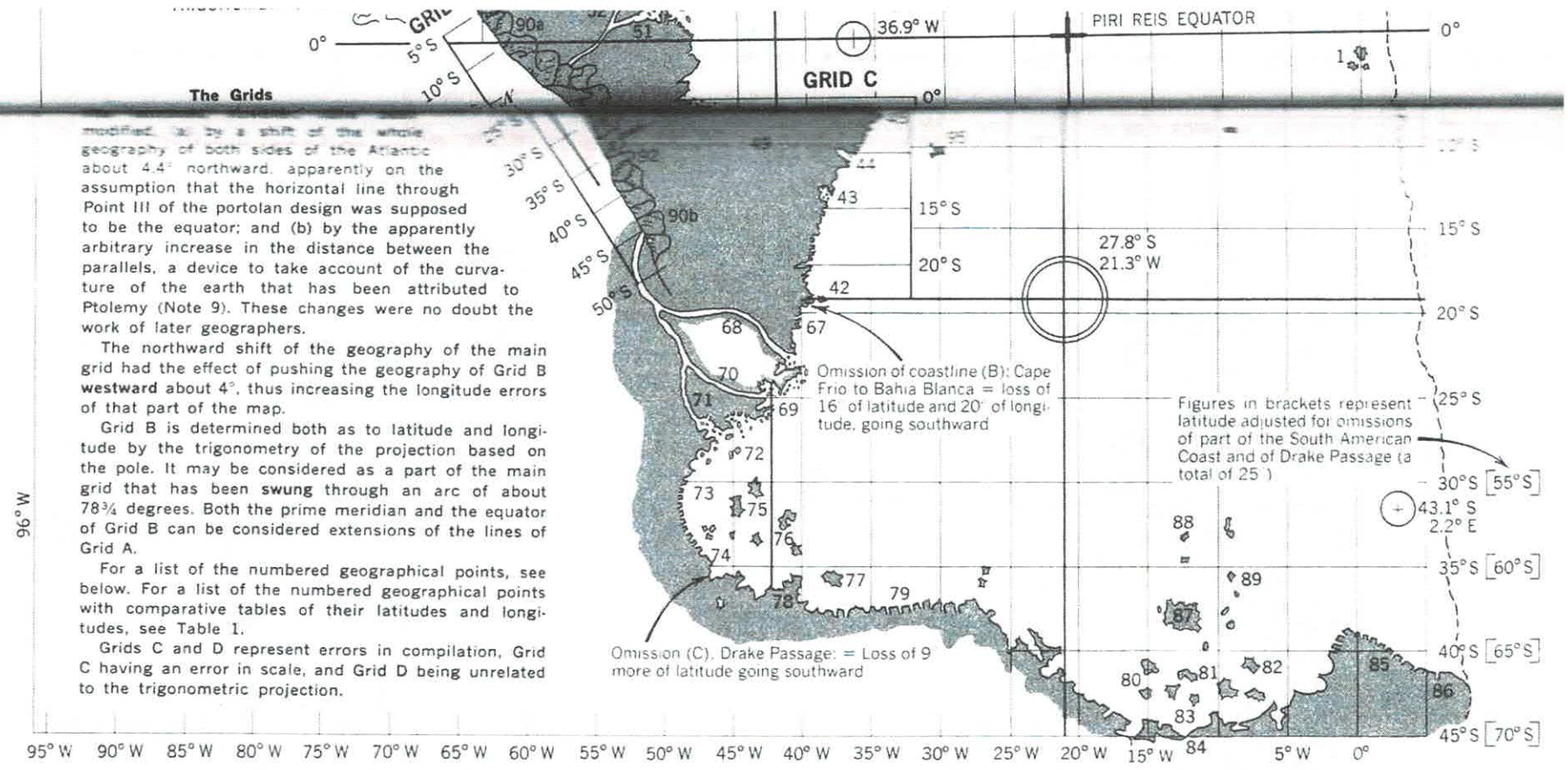
modified, (a) by a shift of the whole geography of both sides of the Atlantic about 4.4° northward, apparently on the assumption that the horizontal line through Point III of the portolan design was supposed to be the equator; and (b) by the apparently arbitrary increase in the distance between the parallels, a device to take account of the curvature of the earth that has been attributed to Ptolemy (Note 9). These changes were no doubt the work of later geographers.

The northward shift of the geography of the main grid had the effect of pushing the geography of Grid B **westward** about 4°, thus increasing the longitude errors of that part of the map.

Grid B is determined both as to latitude and longitude by the trigonometry of the projection based on the pole. It may be considered as a part of the main grid that has been **swung** through an arc of about 78¾ degrees. Both the prime meridian and the equator of Grid B can be considered extensions of the lines of Grid A.

For a list of the numbered geographical points, see below. For a list of the numbered geographical points with comparative tables of their latitudes and longitudes, see Table 1.

Grids C and D represent errors in compilation, Grid C having an error in scale, and Grid D being unrelated to the trigonometric projection.



1. Annobon Islands
2. Cavally River
3. Cape Palmas
4. St. Paul River
5. Mano River
6. Freetown
7. Bijagos Islands
8. Gambia River
9. Dakar
10. Senegal River
11. Cape Blanc
12. Cape Juby
13. Sebu River
14. Gibraltar
15. Guadalquivir River
16. Cape St. Vincent
17. Tagus River
18. Cape Finisterre
19. Gironde River
20. Brest
21. Cape Verde Islands
22. The Canary Islands
23. Madeira Islands
24. The Azores
25. Cuba
    (a) Gulf of Guacanayabo
    (b) Guantanamo Bay
    (c) Bahia de Nipe
    (d) Bahia de la Gloria
    (e) Camaguey Mountains
    (f) Sierra Maestra Mountains
26. Andros Island
27. San Salvador (Watling)
28. Isle of Pines
29. Jamaica
30. Hispaniola (Santo Domingo, Haiti)
31. Puerto Rico
32. Rio Moroni
33. Corantijn River
34. Essequibo River
35. Orinoco River
36. Gulf of Venezuela
37. Pt. Gallinas
38. Magdalena River
39. Gulf of Uraba
40. Honduras (Cape Gracias a Dios)
41. Yucatan
42. Cape Frio
43. Salvador
44. San Francisco River
45. Recife (Pernambuco)
46. Cape Sao Rocque
47. Rio Parahyba
48. Bahia Sao Marcos
49. Serras de Gurupi, de Desordam, de Negro
50. The Amazon (No. 1) Para River
51. The Amazon (No. 2) Para River
52. The Amazon (No. 2) western mouth
53. Island of Marajo
54. Essequibo River
55. Mouths of the Orinoco
56. Peninsula of Paria
57. Martinique
58. Guadaloupe
59. Antigua
60. Leeward Islands
61. Virgin Islands
62. Gulf of Venezuela
63. Magdalena River
64. Atrato River
65. Honduras (Cape Gracias a Dios)
66. Yucatan
67. Bahia Blanca
68. Rio Colorado
69. Gulf of San Mathias
70. Rio Negro (Argentina)
71. Rio Chubua
72. Gulf of San Gorge
73. Bahia Grande
74. Cape San Diego (near the Horn)
75. Falkland Islands
76. The South Shetlands
77. South Georgia
78. The Palmer Peninsula
79. The Weddell Sea
80. Mt. Ropke, Queen Maud Land
81. The Regula Range
82. Muhlig–Hofmann Mountains
83. Penck Trough
84. Neumeyer Escarpment
85. Drygalski Mountains
86. Vorposten Peak
87. Boreas, Passat Nunataks
88. Tristan d'Acunha
89. Gough Island
77. South Georgia
95. Fernando da Naronha

Figure 18

In undertaking a detailed examination of the Piri Re'is Map of 1513, I shall break down the map into sections representing originally separate source maps of smaller areas, which appear to have been combined in a general map by the Greek geographers of the School of Alexandria.[1]

With regard to each of the source maps, which I shall refer to as "component maps," since they are the parts of the whole, I will identify such geographical points as are evident in themselves, or are rendered plausible by their position on the trigonometric grid, and will find their errors of location.

Since in some cases the component maps were not correctly placed on the general map, we have two sorts of errors: those due to mistakes in compilation of the local maps into the general map and those due to mistakes in the original component maps. These can be distinguished because if a component map is misplaced, all the features of that map will be misplaced in the same direction and by the same amount. If the general error is discovered and corrected, then the remaining errors will be errors of the original local maps. We have discovered that in most cases the errors on the Piri Re'is Map are due to mistakes in the compilation of the world map, presumably in Alexandrian times, since it appears, as we shall see, that Piri Re'is could not have put them together at all. The component maps, coming from a far greater antiquity, were far more accurate. The Piri Re'is Map appears, therefore, to be evidence of a decline of science from remote antiquity to classical times.

1. The western coasts of Africa and Europe, from Cape Palmas to Brest, including the North Atlantic islands (Cape Verdes, Canaries, Azores, and Madeira) and some islands of the South Atlantic.

Longitudes, as well as latitudes, along the coasts are seen to be remarkably accurate (see Table 1). The accuracy extends also to the North Atlantic island groups as a whole, with an exception in the case of Madeira.

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[1] I do not wish to exclude the possibility, however, that another reasonable explanation for the source of the compilation may some day be forthcoming.

Geography

Early Cartography

Cycle 4, Week 2

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Bring:

   - Guyot *Geography*
   - *Maps of the Ancient Sea Kings*
   - Globe

2. Printed pages for display:

   1. Piri Re'is Map
   2. Beatus Medieval Map
   3. Andreas Walsperger Map
   4. Dulcert Portolano
   5. Tracing of the Dulcert Portolano
   6. Idrisi Map
   7. Map of Ptolemy
   8. World Map of Eratosthenes
   9. Pomponius Mela World Map
   10. Oronteus Finaeus Map
   11. Dutch Royal Palace
   12. Dutch Eastern Hemisphere
   13. Dutch Western Hemisphere
   14. Delisle World Map

3. Handouts for notebooks:

   - Piri Re'is Map (they should have their copy from last week!)
   - Delisle Map
   - Book excerpt: Maps of Ancient Sea Kings (only one copy per family; note that pages with map pictures aren't in the excerpt, because I got pretty color copies of those maps, which are in the "printed pages for display")

To Start

1. Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries,

kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Reading #4

1. Continue reading *The Maps of the Ancient Sea Kings*, Reading #4 (pages 8–17).
    a. (As you read, whenever he mentions a map, pull it out and examine it with the children, then pass it around so they can look more as you keep reading.)
    b. Don't be slow! Explain things, yes, but keep moving because there's a lot to cover. ☺
2. Figure 1: The Osma Beatus Medieval World Map.
3. Figure 2: The Andreas Walsperger Map of 1448.
4. Figure 3: The Dulcert Portolano Map. *This is a map for a practical navigator.*
    a. (Show "Tracing of…" map with it, to help students understand the Dulcert Portolan better.)
5. Figures 5–8 are academic maps (far less accurate than the portolan).
    a. Figure 5: The World Map of Idrisi.
    b. Figure 6: The World Map of Ptolemy.
    c. Figure 7: The World Map of Eratosthenes.
    d. Figure 8: The World Map of Pomponius Mela.
6. (At the end of Reading #4:) It gets a little technical for our younger students, as Hapgood describes their efforts to convert the Piri Re'is to one drawn using our modern system of latitude and longitude, so we'll skip here. But older students and mamas should read this at home; it's *really* interesting!!

Reading #5

1. This is a short reading, on page 19.

2. We'll skip the details, again, for our younger students, but Hapgood describes the years of research almost a dozen men put into trying to unlock the "key" to the system used to draw the Piri Re'is map, so that they could then figure out what was supposedly shown on the bottom of the map—could it be Antarctica?! Without ice?!

Reading #6

1. **Before beginning this reading, explain:** Eratosthenes was a Greek astronomer and geographer of the 3rd century B.C., who measured the circumference of the earth by taking accound of the angle of the sun at noon as simultaneously observed at Alexandria and at Syene (Alexandria was a few hundred miles north of Syene, in Egypt).

2. This was a marvelous feat of mathematics—to take measurements of the angle of the Sun at two cities only a few hundred miles apart, and extrapolate that to figure the circumference of the entire earth, which is 24,000 miles!!!!! (Math is *so* wonderful!! God demonstrates his faithfulness through mathematics, and we cannot have laws of mathematics apart from him!!!)

    a. Eratosthenes' calculation was very close. We know today that he was 4.5° off (out of 360°, of course—a phenomenal accomplishment!).

    b. But do note—he was 4.5° off, which is where we pick up the story again.

3. This was the most accurate number we had for the circumference of the earth for almost 2,000 years—until Columbus' voyage revealed the New World and opened the Age of Exploration. (Which, in God's providence, happened right as He was opening His Word to His people again, in the Reformation, that the true Gospel might go around the world, as it is this day!)

4. But the point is that Eratosthenes figured this out when *no one was traveling around the world!!!!* And no one could verify his number for 1,800 years, until Magellan, then Drake, then others circumnavigated the world and explored the parts of it that were unknown to Christendom, and, thus, were without the Gospel.

5. Reading #6 begins at the end of a paragraph, on page 33.

The Result

1. In the end (Figure 18, pages 36–37), once they were able to understand the system of lines of the portolan map, they could unlock the entire map and understand every detail on it.

2. Yes, that is the ice-free coastline of Antarctica on the southern part of the map. There are some mistakes in the coastline of South America—some things, like the Amazon River, are in there twice, and some pieces are missing, such as Drake's Passage, but careful study of the coastline reveals that it is not made up, and very accurate.

3. Notice also that in Antarctica, there are pictures of the animals to be found living there. (We have found the remains of plants and animals, buried under the ice; secular scientists initially found that a staggering mystery, but with a massive-volcanic-activity-as-cause-for-the-Flood, leading to Flood-cause-for-the-(single)-Ice Age, this is exactly what Bible-believing scientists' models predict.)

Bonus: Hapgood dug through a staggering number of other ancient maps, and found that many, many of the mapmakers of the 15th and 16th centuries knew of a southern continent. However, the Oronteus Finaeus Map, of 1532, is spectacular. It also shows Antarctica, free from ice at the coasts (though apparently the center of the continent was covered with ice at that time, because there is no detail there). It is *very* accurate, showing the correct details of the coasts, and also the correct locations of mountain ranges on Antarctica.

Reformation/Age of Exploration Maps

1. Before we finish this dive into Cartography History, let's touch on maps from the revolution in world exploration and scientific knowledge that came with the Reformation.

2. The Spanish and Portuguese were the first to begin stretching the bounds of discovery, beyond Christendom into the rest of the world. But the Dutch soon surpassed them.

    a. New York was originally called New Amsterdam.
    b. Australia was originally called New Holland.
    c. New Zealand… is still called New Zealand (after the Dutch province).

3. At the height of the Dutch supremacy on the world seas, the Dutch Royal Palace was built, in the grand entrance of which the crowning glory of their people was on full display—a map of the entire globe. The *entire* globe.
    a. Show three Dutch pictures.

4. Delisle Map.

Geography
Oceania
Australia: Physical

Cycle 4, Week 3

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her. (Or use Cartography_152-153 image.)
2. Captain Cook's Journals—2 excerpts for you to read (Intro & Eastern Australia). *(From* The Explorations of Captain James Cook in the Pacific*, ed. by A. Grenfell Price, New York: The Heritage Press.)*
3. Print to display:
    - Ularu pic
4. Pass out map handouts and colored pencils:
    - Oceania Physical Map—no coloring on this one! Only to look at. We'll use this for several weeks!
    - Australia Physical Map—no coloring. ☺
    - Australia Physical Blackline

To Start

1. Explain Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Great Dividing Range
2. Western Plateau
3. Great Victoria Desert
4. Great Barrier Reef
5. Victoria River
6. Murray River
7. Tasmania
8. Macquarie Island (SW of New Zealand)
9. Great Australian Bight (huge bay)
10. Ularu

Geography

Australia Physical

Turn to *Cartography* p. 152–153.

- We lump Australia, the major islands near it, and the islands sprinkled across the South Pacific, into a region we call Oceania.
- What does Australia look like? What does that mean? (Australia is mostly desert!)
- The Great Barrier Reef is on the northeastern coast of Australia, the longest coral reef in the world, at 1,500 miles long!
- What do Indonesia (which is not part of Oceania) and New Guinea look like? (They're green—very jungle-y!)
- What do you notice about Tasmania & New Zealand? (Snow-capped peaks; cool weather there! They're pretty far south, so they're kind of like England and Scotland as far as weather goes.)
- What is all of the light blue? (The dark blue is the deep ocean, and the lighter blue is where the ocean is not very deep, so the ocean floor is close enough to the surface that it reflects some sunlight back to us, so the water only look light blue.)
- What do the Pacific islands look like? (Blue!!!! Why do they look blue from space? Because they are really gigantic mountains, rising up from the ocean floor, volcanoes really. And only the little tips of them rise above the surface of the ocean, not even big enough, many of them, for their green surfaces to be visible from up in space.)
- Can you find the International Date Line? (No! Of course not! It's imaginary!!)

Learn More

- Compare the coloring on your Oceania map with your Australia map. What kind of map is the Oceania map? (Relief.) What kind of map is the Australia map?
- (Mr. van Eck visited Australia; he saw Alice Springs and the Ularu! Of course, he flew in and out of Sydney!)
- Look at your world maps; see how far Tasman sailed from Mauritius (little island East of Madagascar) to the island which would come to be called Tasmania, to the south of Australia, never seeing the continent!
- You may look at your maps, or trace (not color!) your blackline map, while I read to you a bit from the Journals of Captain Cook.
- Read Intro, pages 1–3, through halfway down page 3.
- Then read Eastern Australia (pages 63 ff.), as much as there is time for. ☺

Drill Again

Java Sea
GREATER SUNDA ISLANDS
MOLUCCAS
INDONESIA
JAKARTA
Banda Sea
NEW GUINEA
PAPUA NEW GUINEA
NEW BRITAIN
DILI
TIMOR-LESTE
PORT MORESBY
SANTA CRUZ ISLANDS
INDIAN
OCEAN
MELANESIA
VANUATU
PORT VILA
Coral Sea
Great Barrier Reef
FIJI
SUVA
KIMBERLEY PLATEAU
GREAT SANDY DESERT
CORAL SEA IS.
NEW CALEDONIA
GREAT DIVIDING RANGE
Tropic of Capricorn
AUSTRALIA
WESTERN PLATEAU
GREAT ARTESIAN BASIN
GREAT VICTORIA DESERT
NORFOLK ISLAND
NULLARBOR PLAIN
MURRAY-DARLING BASIN
Perth
Adelaide
CANBERRA
Sydney
Brisbane
Melbourne
Great Australian Bight
NORTH ISLAND
Tasman Sea
TASMANIA
WELLINGTON
NEW ZEALAND
SOUTHERN
OCEAN
SOUTH ISLAND

Australia: Physical Map

Lable and shade the following:

Great Dividing Range
Great Victoria Desert
Great Barrier Reef
Uluru (aka Ayers Rock)

Label the following:

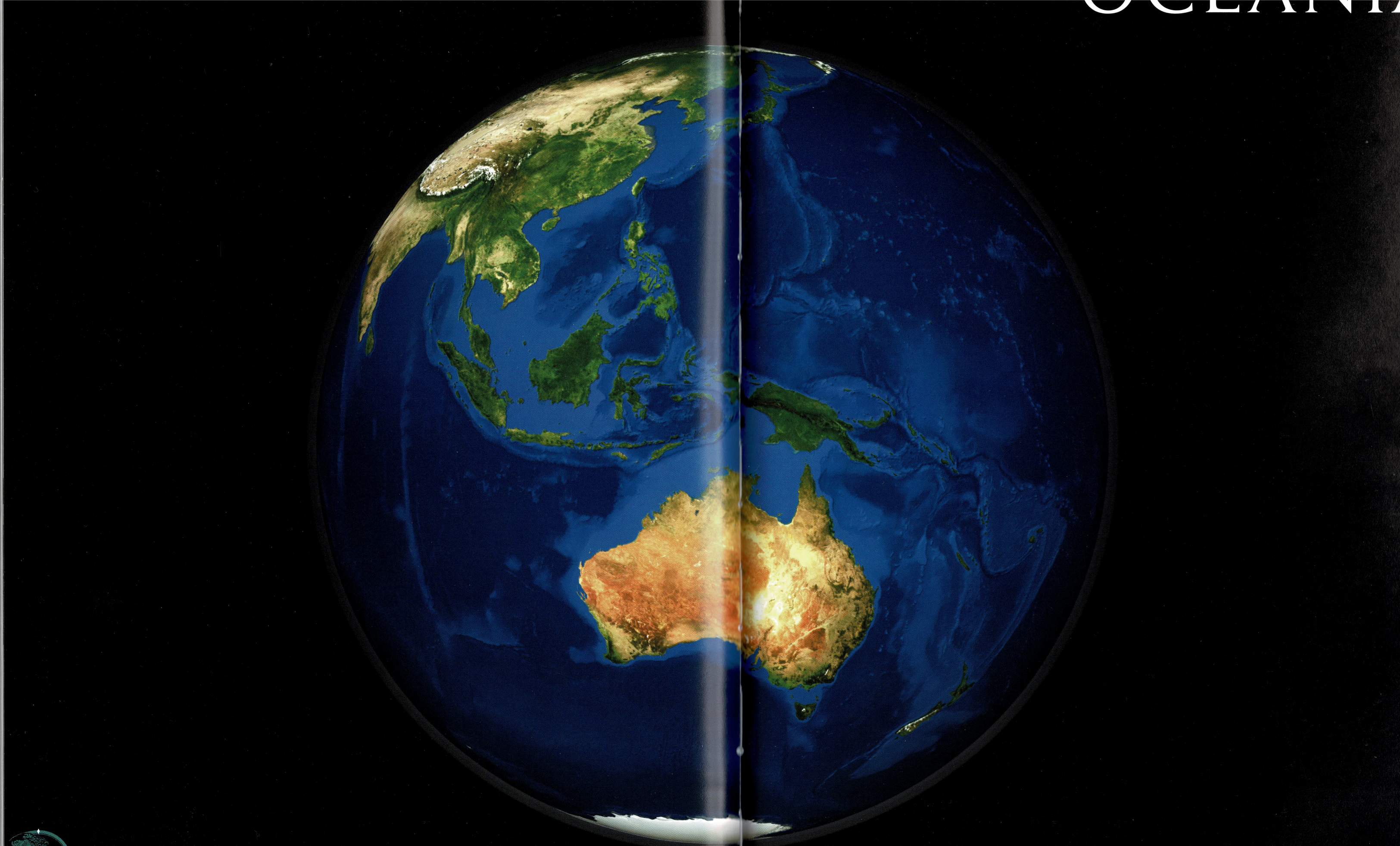
Indian Ocean, Pacific Ocean, Coral Sea

Key

Major Desert

Major mountain range

OCEANI




OCEANIA
0 km 500 1000 1500 km
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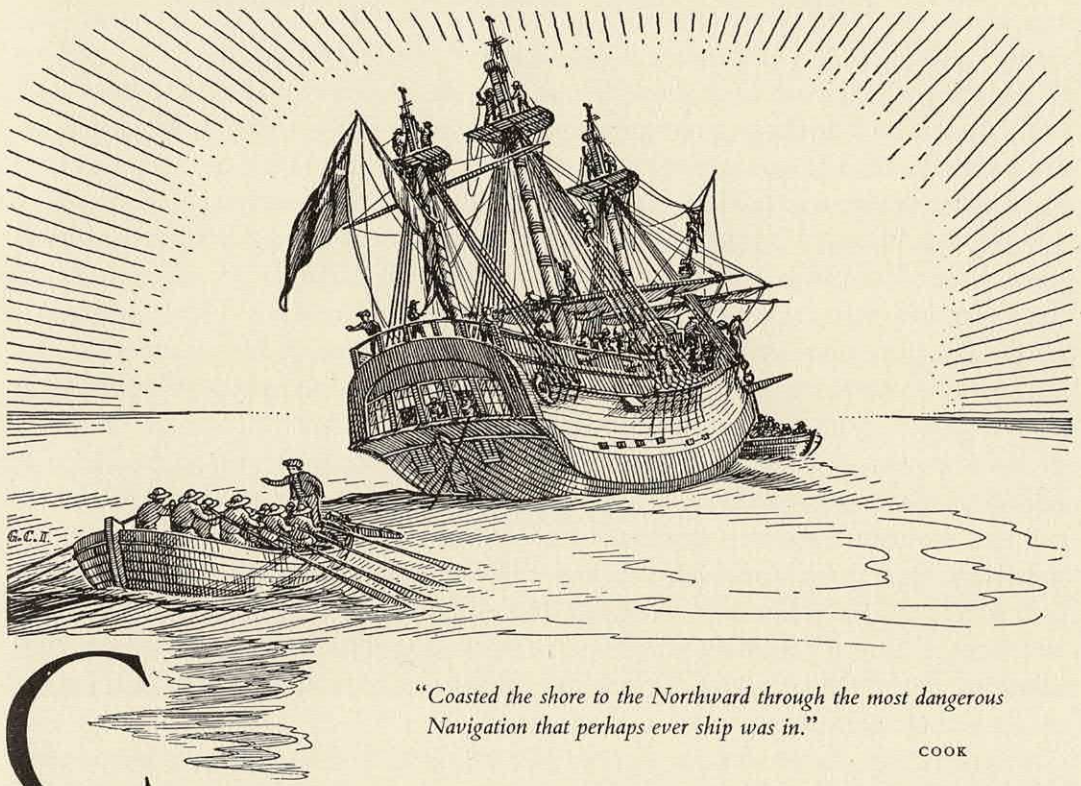
NORTH
PACIFIC OCEAN
SOUTH
PACIFIC OCEAN
INDIAN OCEAN
AUSTRALIA
NEW ZEALAND
PAPUA NEW GUINEA
INDONESIA
PHILIPPINES
MALAYSIA
VIETNAM
CHINA
TAIWAN
BRUNEI
EAST TIMOR
PALAU
FEDERATED STATES OF MICRONESIA
MARSHALL ISLANDS
NAURU
KIRIBATI
TUVALU
SOLOMON ISLANDS
VANUATU
FIJI
SAMOA
TONGA
Hawaiian Islands (U.S.A.)
Northern Mariana Is. (U.S.A.)
New Caledonia (Fra.)
French Polynesia
Pitcairn (UK)
Cook Islands
Micronesia
Melanesia
Caroline Islands
CORAL SEA
TASMAN SEA
ARAFURA SEA
SOUTH CHINA SEA
BISMARCK SEA
SOLOMON SEA
TIMOR SEA
JAVA SEA
BANDA SEA
CELEBES SEA
PHILIPPINE SEA
Great Barrier Reef
Great Australian Bight
WESTERN AUSTRALIA
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
Tasmania
North Island
South Island
CANBERRA
WELLINGTON
PORT MORESBY
HONIARA
PORT VILA
SUVA
APIA
NUKU'ALOFA
FUNAFUTI
TARAWA
YAREN
MAJURO
PALIKIR
KOROR
MANILA
JAKARTA
DILI
T'AIPEI
Sydney
Melbourne
Brisbane
Adelaide
Perth
Hobart
Darwin
Auckland
Christchurch
Dunedin
Hong Kong
Honolulu
Borneo
New Guinea
Java
Celebes
Luzon
Mindanao
Hainan
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
INTERNATIONAL DATE LINE
Gibson Desert
Great Sandy Desert
Great Victoria Desert
Simpson Desert
Lake Eyre
Kiritimati
Marquesas Is.
Society Archipelago
Tuamotu Archipelago
Austral Islands
Kermadec Islands (N.Z.)
Chatham Islands
Tokelau (N.Z.)
American Samoa (USA)
Niue (N.Z.)
ezilon.com

Chapter VI

EASTERN AUSTRALIA, 1770



"Coasted the shore to the Northward through the most dangerous Navigation that perhaps ever ship was in."

COOK

COOK PROBABLY SAILED FOR AUSTRALIA WITH TWO GREAT geographical problems in his mind. First, how far did New Holland, the lands skirted by Tasman, Van Nuyts and others, stretch towards New Zealand? Second, were these lands one great continent of which Van Diemen's Land, New Guinea and de Quiros' Espiritu Santo were all parts, or were they only island groups? To answer these questions, which had puzzled Europe for over a century, Cook sailed in the *Endeavour* on 1st April 1770, to discover the east coast of Australia.

THE EAST AUSTRALIAN COAST

¶ Cook's Journal shows that he intended to pick up Tasman's work where the Dutch navigator left Van Diemen's Land. On 16th April he took soundings all night in case he was approaching land in Latitude 39° 40′, which means that the *Endeavour* was nearing the completely unknown region of Bass Strait. At this moment a heavy gale from the south drove the explorer north and

unfortunately prevented him from settling whether or not Van Diemen's Land was joined to New Holland, a matter on which he was clearly in doubt, for he wrote as follows:—

THURSDAY 19*th* April. In the PM had fresh gales at SSW and Clowdy Squaly weather with a large Southerly Sea. At 6 took in the Topsails and at 1 am brought too and sounded but had no ground with 130 fathoms of line. At 5 Set the Topsails Close reef'd and at 6 saw land extending from NE to West at the distance of 5 or 6 Leagues having 80 fathom water a fine sandy bottom. We continued Standing to the westward with the wind at SSW untill 8 oClock at which time we got topg^{t} yards aCross, made all sail and bore away along shore NE for the Eastermost land we had in sight, being at this time in the Latitude of 37° 58′ S and Long^{d} of 210° 39′ West. The Southermost Point of land we had in sight which bore from us W¼S I judged to lay in the Latitude of 38° 0′ S and in the Longitude of 211° 07′ W from the Meridion of Greenwich. I have Named it *Point Hicks*, because Leuit^{t} Hicks was the first who discover'd this land.

'To the Southward of this point we could see no land and yet it was very clear in that quarter and by our Longitude compared with that of Tasmans the body of Vandiemens land ought to have bore due south from us and from the soon falling of the Sea after the wind abated I had reason to think it did, but as we did not see it and finding this coast to trend NE and SW or rather more to the westward makes me doubtfull whether they are one land or no: however every one who compares this Journal with that of Tasmans will be as good a judge [as] I am, but it is necessary to observe that I do not take the situation of Vandiemens from the prented Charts but from the extract of Tasmens *Journal* published by *Dirk Rembrantse*.

¶ According to Professor G. A. Wood, Point Hicks was unfortunately renamed Cape Everard in 1843 by Stokes.

¶ From Point Hicks Cook sailed north from 20th April to 29th April, as he considered Bateman's Bay and Jervis Bay insufficiently sheltered as anchorages. On 29th April, however, he anchored in Botany Bay where a week's stay led to the choice of this spot as the tentative site of the first British settlement. Strangely enough this was partly due to the fact that Cook, usually the most careful and accurate observer, overestimated the potentialities of the harbour and surrounding soils.

¶ Also on Sunday, 6th May, he wrote that the Bay was 'Capacious, safe and commodious', whereas Governor Phillip found in 1783 that the harbour was exposed to easterly winds, while disgruntled colonists hunted in vain for the 'fine Meadow', with the result that Botany Bay was abandoned for Sydney. Professor G. A. Wood in his *Discovery of Australia*, points out the very curious fact that Banks, whose advice was primarily responsible for the despatch of the convicts, was much less impressed by Botany Bay than was Cook.

¶ Cook's accounts of the Australian aboriginals were less enthusiastic and more accurate than his accounts of the surrounding country.

¶ In 1779, in giving his evidence to a committee of the House of Commons on the choice of a site for a British colony in the Pacific, Banks strengthened what was already an unduly optimistic statement by giving his opinion that the natives were 'few and cowardly'. One suspects that this was a main reason for the choice of Botany Bay rather than New Zealand, for, much as the British Government wished to rid itself of its convicts, it must have feared the danger of disposing of them as the pièce de résistance in Maori feasts.

¶ Cook at first named the harbour Stingray Bay owing to the capture of a number of huge fish. When, however, Banks and Solander secured the wealth of plants which was to revolutionize botanical science, he changed his original Journal first to 'Botanist' and later to 'Botany Bay'.

SATURDAY 28*th* April. At day light in the morning we discoverd a Bay which appeard to be tollerably well shelterd from all winds into which I resoloved to go with the Ship and with this view sent the Master in the Pinnace to sound the entrance while we kept turning up with the Ship haveing the wind right out. At Noon the entran[c]e bore NNW distance 1 Mile.

SUNDAY 29*th* April. Saw as we came in on both points of the bay Several of the natives and a few hutts, Men, women and children on the south shore abreast of the Ship, to which place I went in the boats in hopes of speaking with them accompaned by M^{r} Banks D^{r} Solander and Tupia; as we approached the shore they all made off except two Men who seemd resolved to oppose our landing. As soon as I saw this I orderd the boats to lay upon their oars in order to speake to them but this was to little purpose for neither us nor Tupia could understand one word they said. We then threw them some nails beeds &c^{a} a shore which they took up and seem'd not ill pleased in so much that I thout that they beckon'd to us to come a shore; but in this we were mistaken, for as soon as we put the boat in they again came to oppose us upon which I fired a musket between the two which had no other effect than to make them retire back where bundles of thier darts lay, and one of them took up a stone and threw at us which caused my fireing a second Musquet load with small shott, and altho some of the shott struck the man yet it had no other effect than to make him lay hold of a Shield or target to defend himself. Emmidiatly after this we landed which we had no sooner done than they throw'd two darts at us, this obliged me to fire a third shott soon after which they both made off, but not in such haste but what we might have taken one, but M^{r} Banks being of opinion that the darts were poisoned, made me cautious how I advanced into the woods. We found here a few Small hutts made of the bark of trees in one of which were four or five small children with whome we left some strings of beeds &c^{a}. A quantity of darts lay about the hutts these we took away with us.

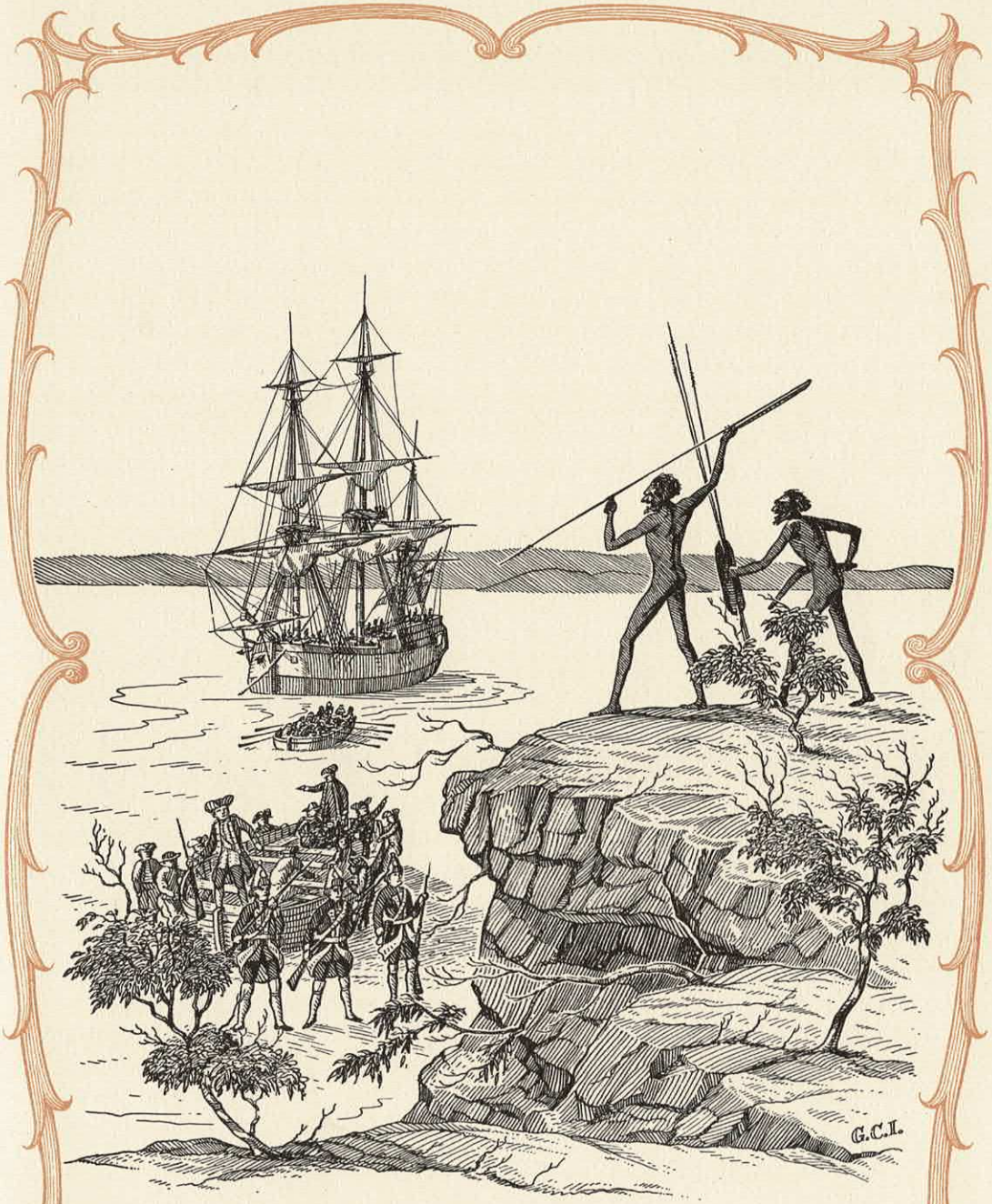
Three Canoes lay upon the bea[c]h the worst I think I ever saw, they were about 12 or 14 feet long made of one peice of the bark of a tree drawn or tied up at each end and the middle kept open by means of peices of sticks by way of Thwarts.

[MAY 1770]

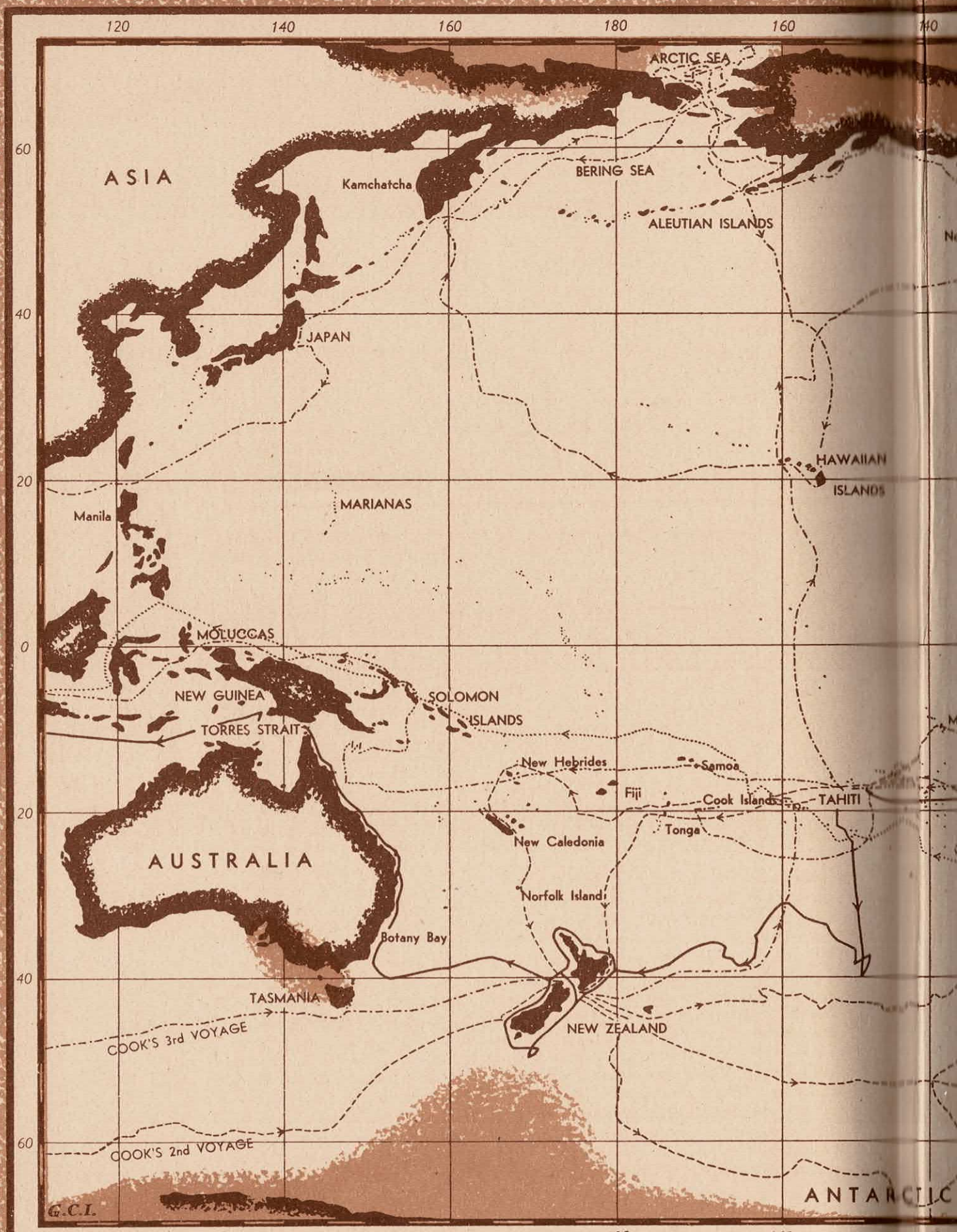
TUESDAY *1st* May. Last night Torby Sutherland seaman departed this life and in the AM his body was buried a shore at the watering place which occasioned my calling the south point of this Bay after his name. This morning a party of us went ashore to some hutts not far from the watering place where some of the natives are daly seen, here we left several articles such as Cloth, Looking glasses, Combs, Beeds Nails &c[a]. After this we made an excursion into the country which we found deversified with woods, Lawns and Marshes; the woods are free from under wood of every kind and the trees are at such a distance from one a nother that the whole Country or at least great part of it might be cultivated without being oblig'd to cut down a single tree; we found the soil every where except in the Marshes to be a light white sand and produceth a quant[it]y of good grass which grows in little tufts about as big as one can hold in ones hand and pretty close to one another, in this manner the surface of the ground is coated in the woods between the trees. D[r] Solander had a bad sight of a small Animal some thing like a rabbit and we found the dung of an Animal which must feed upon grass and which we judged could not be less than a deer, we also saw the track of a dog or some such like Animal.

FRIDAY *4th* May. In the AM as the wind would not permit us to sail I sent out some parties into the Country to try to form some Connections with the natives. One of the Midshipmen met with a very old man and woman and two small Children; they were close to the water side where several more were in their canoes gathering shell fish and he being alone was afraid to make any stay with the two old people least he should be discoverd by those in the Canoes. He gave them a bird he had shott which they would not touch neither did they speak one word but seem'd to be much frighten'd, they were quite naked even the woman had nothing to cover her nuditie. D[r] Munkhouse and a nother man being in the woods not far from the watering place discoverd Six more of the natives who at first seemd to wait his coming but as he was going up to them had a dart thrown at him out of a tree which narrowly escaped him, as soon as the fellow had thrown the dart he desended the tree and made off and with him all the rest and these were all that were met with in the Course of this day.

SUNDAY *6th* May. In the evening the yawl return'd from fishing having caught two Sting rays weighing near 600 pounds. The great quantity of New Plants &c[a] M[r] Banks & D[r] Solander collected in this place occasioned my giveing it the name of *Botany Bay*. It is situated in the Latitude of 34° 0′ s, Longitude 208° 37′ West; it is Capacious safe and commodious. . . . We anchord near



LANDING AT BOTANY BAY
APRIL 1770


120
140
160
180
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60
ARCTIC SEA
ASIA
Kamchatcha
BERING SEA
ALEUTIAN ISLANDS
JAPAN
HAWAIIAN
ISLANDS
MARIANAS
Manila
MOLUCCAS
NEW GUINEA
SOLOMON
ISLANDS
TORRES STRAIT
New Hebrides
Samoa
Fiji
Cook Islands
TAHITI
Tonga
New Caledonia
AUSTRALIA
Norfolk Island
Botany Bay
TASMANIA
NEW ZEALAND
COOK'S 3rd VOYAGE
COOK'S 2nd VOYAGE
ANTARCTIC
G.C.I.

the south shore about a Mile within the entrance for the conveniency of sailing with a Southerly wind and the geting of fresh water but I afterwards found a very fine stream of fresh water on the north shore in the first sandy cove within the Island before which a Ship might lay almost land lock'd and wood for fual may be got every where: altho wood is here in great plenty yet there is very little variety, the largest trees are as large or larger than our oaks in England and grows a good deal like them and yeilds a redish gum, the wood itself is heavy hard and black like Lignum Vitae; another sort that grows tall and strait some thing like Pines, the wood of this is hard and Ponderous and something of the nature of American live oaks, these two are all the timber trees I met with. There are a few sorts of Shrubs and several Palm trees, and Mangroves about the head of the harbour. The Country is woody low and flat as far inland as we could see and I believe that the soil is in general sandy, in the wood are a variety of very boutifull birds such as Cocatoo's Lorryquets, Parrots &c[a] and Crows exactly like those we have in England.

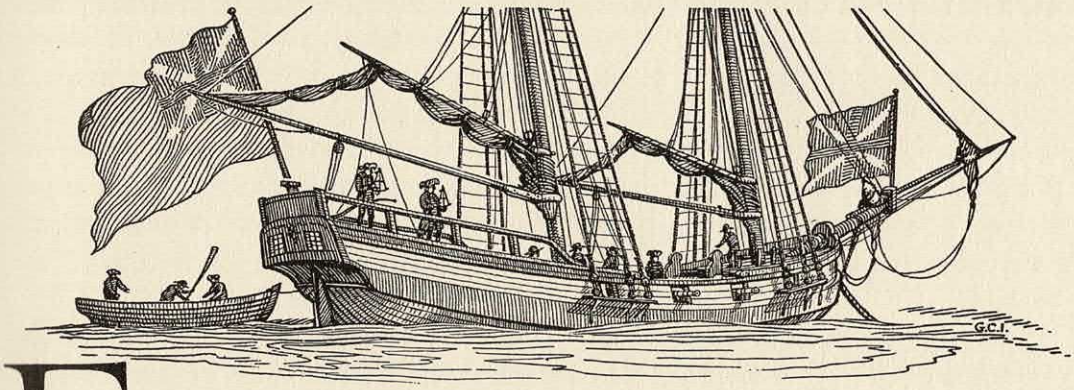
'The natives do not appear to be numberous neither do they seem to live in large bodies but dispers'd in small parties along by the water side; those I saw were about as tall as Europeans, of a very dark brown colour but not black nor had they wooly frizled hair, but black and lank much like ours. No sort of cloathing or ornaments were ever seen by any of us upon any one of them or in or about any of their hutts, from which I conclude that they never wear any. Some we saw that had their faces and bodies painted with a sort of white paint or Pigment. Altho I have said that shell fish is their chief support yet they catch other sorts of fish some of which we found roasting on the fire the first time we landed, some of these they strike with gigs and others they catch with hook and line; we have seen them strike fish with gigs & hooks and lines were found in their hutts. Sting rays I believe they do not eat because I never saw the lest remains of one near any of their hutts or fire places. However we could know but very little of their customs as we never were able to form any connections with them, they had not so much as touch'd the things we had left in their hutts on purpose for them to take away. During our stay in this Harbour I caused the English Colours to be display'd ashore every day and an inscription to be cut out upon one of the trees near the watering place seting forth the Ships name, date &c[a]. Having seen every thing this place afforded we at day light in the Morning weigh'd with a light breeze at NW and put to sea.

SHIPWRECK

¶ After leaving Botany Bay on 7th May 1770, Cook steered northwards along the East Australian coast encountering no serious trouble for some five weeks excepting the fact that unknown persons assaulted his clerk, Orton, the chief suspects being Midshipmen Magra and Saunders. Magra, or Matra, later

Chapter I

OCEAN PROBLEMS OF THE *18th* CENTURY



"The space unknown from the Tropics to 50° South Latitude must be nearly all land."

ALEXANDER DALRYMPLE, 1767

FEW HISTORIANS WOULD DENY THAT THE SEA-EXPLORATIONS of Bartholomew Diaz, Christopher Columbus, Ferdinand Magellan and James Cook rank with the most fruitful accomplished by Europeans, but few would attempt to compare the merits of seamen who made their discoveries in different regions, times and ships, and with different crews and scientific aids. All made great contributions to man's knowledge of the surface of the Earth; all played leading parts in developments which opened up four new and unknown continents to the people of the Old World, yet no earlier explorer could present the many sided achievements of Cook in solving the ocean problems of his day and generation—the Eighteenth Century. Even if we admit that between Diaz's rounding of the Cape of Good Hope in 1487 and Cook's discovery of Eastern Australia in 1770 European culture in such forms as shipbuilding, navigation and cartography had made considerable progress, it was nevertheless a stupendous contribution to exploration and science that one man should dissolve the age-old myth of a vast southern continent; discover Eastern Australia, together with Hawaii and other Pacific Islands; delineate New Zealand and forecast its value; confirm Bering's discoveries in the Arctic; greatly advance navigation and cartography and build on the work of Lind and others to save the lives of millions of seamen by the use of anti-scorbutics.

¶ The character of the author of these achievements will be to some extent revealed in the extracts which follow from his own simple and straightforward Journals. It is sufficient to say here that, in spite of a very humble origin and early environment, James Cook rose to the heights of supreme achievement by great

ability, great courage, great determination, great capacity for hard work, and the power to take infinite pains. These qualities, which probably resulted in part from a Scottish-Yorkshire ancestry, enabled him to develop, with slight assistance and in the face of almost overwhelming disadvantages, a remarkable aptitude for mathematics and a genius for cartography—that extraordinary skill in the charting of unknown coasts which according to Admiral Wharton 'enabled him to originate, as it may be truly said he did, the art of modern marine surveying'. Yet in spite of the fact that his great achievements made him famous in his own lifetime, he remained reserved, unostentatious and modest. When he completed his first expedition, one of the most fruitful explorations in history, he modestly wrote to the British Admiralty, 'I flatter myself that the discoveries we have made, tho' not great, will apologise for the length of the voyage'.

¶ For the understanding of Cook's contribution towards the solution of the ocean problems of the Eighteenth Century consideration must be given to the state of knowledge on at least five great questions at the time of his first expedition in 1768-71. These questions were the existence of a vast Southern Continent; the size and shape of Eastern Australia and New Zealand; the geography of the far north of the Pacific and the adjoining Arctic; navigation and cartography; and the problem of sea disease. The extracts which follow from Cook's own Journals will illustrate, however, many other contributions made by Cook and his co-workers in fields such as anthropology, botany and zoology.

¶ The mystery of a Southern Continent had existed from classical times when the Greeks had believed that southern land masses must exist to balance those in the north. Ptolemy (A.D. 150) and certain medieval geographers had filled the Southern Hemisphere with a vast continent. About A.D. 1500 explorers, such as Columbus and Magellan, showed that the Earth was a globe of immense size, with ample room for new continents, in addition to the Americas, in the huge Pacific and Southern oceans. Almost simultaneously, however, Diaz's rounding of the Cape of Good Hope, and Magellan's discovery of his Straits, followed in 1578 by Drake's discovery of the Cape Horn passage, punched seaways from the eastern and western Atlantic into the newly discovered oceans, and this, with the existing Asian sea knowledge, indicated the separation of the Old World from any Southern land masses. In the years which followed Spanish, Dutch, English and other sea voyages across the Pacific in several locations and directions showed that no great continent could exist in the northern or central parts of that ocean, but these expeditions mainly sailed from east to west with the Trade Winds, and, although they discovered many islands which they immediately lost, through inability to calculate longitude, they left unknown the southern seas, in which, through misinterpretation of the reports of Marco Polo and of Magellan's expedition, certain geographers could still locate an immense continent. From

1606 onwards, however, the Dutch, in developing the spice trade of the East Indies, began to produce concrete evidence that some southern land masses existed. Early in 1606 a very fine Dutch seaman, later Admiral William Jansz, who was to fight with and against the English, discovered Australia, and successive Dutch explorers, sailing eastward towards, or southwards from, the East Indies, filled in the map of the continent from the Great Australian Bight in the south to Jansz' discoveries in the Gulf of Carpentaria in the north east. Yet the Dutch did not discover or explore the fertile east coast, possibly because they failed to penetrate from the west the strait between Australia and New Guinea which a Spanish expedition under Torres and Prado navigated from the east in late 1606, probably without sighting the southern continent.

¶ In 1642-3 Anthony Van Diemen, an outstanding Dutch Governor of the East Indies, made a highly important contribution to the solution of the problem, when, at the suggestion of the far-sighted pilot Visscher, he despatched Abel Tasman and Visscher to sail from Mauritius with the westerly winds in order to find a commercial route to South America. Keeping far south of the tracks of previous voyagers the expedition passed south of Australia, the Dutch 'New Holland', to discover Van Diemen's Land (Tasmania) and Staten Land (New Zealand), although the explorers gave a poor report on the former island, and failed to land in New Zealand owing to the ferocity of the Maoris. Tasman and Visscher had, however, proved that New Holland must be a comparatively small continent or group of islands, and not a vast land mass stretching across the Pacific to New Zealand or southwards towards the Pole.

¶ The Dutch were now weary of unprofitable explorations. Instead of gold and spices their New Holland had yielded little but incredibly primitive men and incredibly ugly women. As traders rather than colonisers they concentrated upon the wealth of the tropics, leaving the discovery and colonization of any temperate lands to the rising seafarers of England and France.

¶ Portugal, Spain, Holland, Britain and France were all prepared to seek God, Glory and Gold in a varied order of importance, and the time had now arrived when Britain and France realised, that, with the development of ships, navigation, and ocean routes, they must despatch official expeditions to ascertain whether or not the South Seas contained land masses which would be of value to sea power, commerce and colonization, and as sewer vents for convicts, more emphasis being laid on advancing the glory of science than on the old Spanish objective of advancing the glory of God. In France De Brosses, and in England Campbell, Callander and Dalrymple of the 'Dry Land' school, proclaimed with individual variations the existence of an immense south land with promontories or coastlines at Cape Circumcision (Bouvet Island) to the south west of South Africa; Davis Land, to the west of Chile; New Zealand, and De Quiros' Land (The New Hebrides), although these last were situated in the Pacific as far north

Geography
Oceania
Australia: Cities & Provinces

Cycle 4, Week 4

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her. (If you don't have it, it's not that important.)
2. Animals of Australia for you to print and read (and show) to the children.
3. Pass out map handouts and colored pencils:
   - Oceania Physical Map (from last week)
   - Oceania Cities & Political Map—no coloring (we'll use this again!). ☺
   - Oceania Cities & Political Blackline Map—to trace

To Start

1. Explain Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Sydney
2. Melbourne
3. Brisbane
4. Perth
5. New South Wales
6. Victoria
7. Queensland
8. South Australia
9. Western Australia
10. Northern Territory

Australia Cities & Provinces

Turn to *Cartography* p. 160–161, 158.

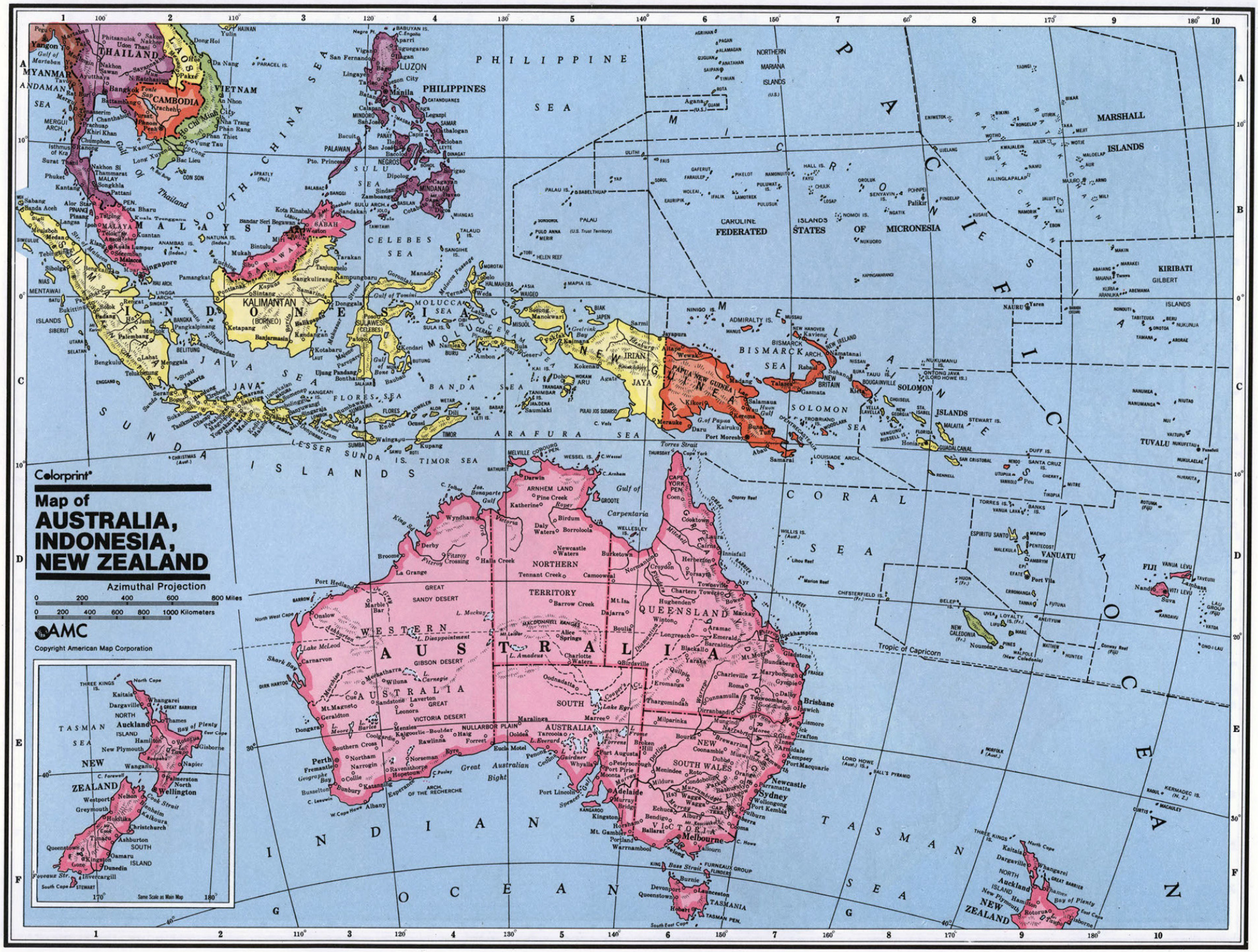
Geography

- Very few people live in Australia! It's the least-populated continent (other than Antarctica). As we learned last week, it's very, very dry and desert-y. Only the Eastern coast, all the area East of the Great Dividing Range, is nice for farming, really. There are some rainforests there; that's where you'll find koalas!
- During the Reformation and Age of Exploration period, when Christians sailed out of Europe to explore the world, the people living in Australia at that time were called Aborigines, and they lived in the very lowest of conditions. Like their neighbors the Pacific islanders, they were illiterate, running around naked, living under witchdoctors who spoke for their demonic animistic "gods", and mutilated their bodies with tattoos and piercings. The Lord sent judgment and salvation—for many, there was slaughter at the hands of pagan, Darwinist Europeans. But for some, there was the sweet Gospel brought by missionaries.
- We don't know a whole lot about the history of the Aborigines, because they didn't keep written records. After the British lost the American War for Independence, they started sending their bad prisoners off to Australia for punishment, and to help them colonize that land. The white folks that settled Australia were, basically, the exact opposite of the devoted Christians who settled America looking to worship God freely!! After Darwin's wicked book was published, the white Australians decided that the Aborigines were the perfect example of a "transitional form" from monkey to man; they began hunting the Aborigines like animals, boiling their bodies to sell the bones to museums, and one Aborigine man was even kept in the New York Central Park zoo, in the monkey exhibit, for decades.

Learn More

- Australia also has unique animals, because of how separated it is from the other continents. See Animals of Australia handout.

Drill Again


Colorprint
Map of
AUSTRALIA, INDONESIA, NEW ZEALAND
Azimuthal Projection
0 200 400 600 800 Miles
0 200 400 600 800 1000 Kilometers
AMC
Copyright American Map Corporation
AUSTRALIA
INDONESIA
NEW ZEALAND
PHILIPPINES
PACIFIC OCEAN
INDIAN OCEAN
TASMAN SEA
CORAL SEA
Tropic of Capricorn
Same Scale as Main Map


CHINA
Wenzhou
Fuzhou
Quanzhou
Xiamen
Guangzhou
Shantou
Hong Kong S.A.R.
Macau S.A.R.
Taipei
Taiwan
Kaohsiung
Luzon Strait
Okinawa
Naha
RYUKYU ISLANDS (JAPAN)
DAITO-SHOTO (JAPAN)
BONIN ISLANDS (JAPAN)
VOLCANO ISLANDS (JAPAN)
Minami-tori-shima (JAPAN)
Okino-tori-shima (JAPAN)
Philippine Sea
South China Sea
PHILIPPINES
Manila
Luzon
Panay
Iloilo
Samar
Cebu City
Bacolod
Negros
Palawan
Sulu Sea
Cagayan de Oro
Mindanao
Zamboanga
Davao
Saipan
Hagåtña
Guam (U.S.)
Northern Marianna Islands (U.S.)
FEDERATED STATES OF MICRONESIA
Entwetak
Kwajalein
Pohnpei
Palikir
CAROLINE ISLANDS
Melekeok
PALAU
MARSHALL ISLANDS
Majuro
Wake Island (U.S.)
Johnston Atoll (U.S.)
Midway Islands (U.S.)
HAWAIIAN ISLANDS (U.S.)
Kauai
Oahu
Honolulu
Maui
Hawaii
North Pacific Ocean
Kingman Reef (U.S.)
Palmyra Atoll (U.S.)
Kirimati (Christmas Island) (KIRIBATI)
BRUNEI
Bandar Seri Begawan
MALAYSIA
Celebes Sea
Borneo
Manado
Halmahera
Ternate
Molucca Sea
Samarinda
Balikpapan
Palu
Sorong
Biak
Banjarmasin
Buru
Ceram
Kendari
Ambon
Jayapura
Wewak
Bismark Sea
New Ireland
PAPUA NEW GUINEA
Madang
Mount Hagen
Lae
New Guinea
New Britain
Bougainville
Java Sea
Banda Sea
Makassar
Surabaya
INDONESIA
Bali
Sumbawa
Flores
Lombok
Sumba
Dili
Denpasar
Kupang
TIMOR-LESTE
Timor
Timor Sea
Arafura Sea
Torres Strait
Port Moresby
Alotau
Guadacanal
SOLOMON ISLANDS
Honiara
Solomon Sea
Ashmore and Cartier Island (AUSTRALIA)
Darwin
Gulf of Carpentaria
Indian Ocean
Coral Sea Islands (AUSTRALIA)
Coral Sea
Great Barrier Reef
Cairns
Townsville
Mount Isa
Port Hedland
Mackay
Rockhampton
Gladstone
Alice Springs
AUSTRALIA
Toowoomba
Brisbane
Gold Coast
Geraldton
Kalgoorlie
Perth
Rockingham
Bunbury
Esperance
Broken Hill
Whyalla
Newcastle
Sydney
Adelaide
Canberra
Wollongong
Great Australian Bight
Geelong
Melbourne
Bass Strait
Launceston
Hobart
Tasmania
Indian Ocean
Tasman Sea
Lord Howe Island (AUSTRALIA)
Kingston
Norfolk Island (AUSTRALIA)
KERMADEC ISLANDS (N.Z.)
North Island
Auckland
Hamilton
Tauranga
Palmerston North
Hastings
NEW ZEALAND
Wellington
Christchurch
South Island
Invercargill
Dunedin
Stewart Island
CHATHAM ISLANDS (N.Z.)
South Pacific Ocean
Tarawa
KIRIBATI (GILBERT ISLANDS)
Howland Island (U.S.)
Baker Island (U.S.)
Jarvis Island (U.S.)
Yaren District
NAURU
Banaba
KIRIBATI
RAWAKI (PHOENIX ISLANDS)
LINE ISLANDS
KIRIBATI
ÎLES MARQUISES
TUVALU
Funafuti
Tokelau (N.Z.)
SANTA CRUZ ISLANDS
Rotuma
Wallis and Futuna (FRANCE)
Swains Island
SAMOA
Mata-Utu
Apia
Pago Pago
American Samoa (U.S.)
Cook Islands (N.Z.)
ARCHIPEL DES TUAMOTU
SOCIETY ISLANDS
Papeete
Tahiti
VANUATU
Port-Vila
FIJI
Vanua Levu
Viti Levu
Suva
Alofi
Niue (N.Z.)
TONGA
Nuku'Alofa
Ceva-i-Ra
New Caledonia (FRANCE)
Noumea
Minerva Reefs
Avarua
French Polynesia (FRANCE)
Mururoa
ÎLES GAMBIER
ÎLES TUBUAI
Adamstown
Pitcairn Islands (U.K.)

15 Best Known Unique Wild Animals of Australia

Australia is home to list of different and unique variety of animals, birds, reptiles and plants, Among Australia's best known wild animals are the kangaroo, koala, echidna, dingo, platypus and wallaby. Famous animals found in Australia also include marine animals such as cone snail, sea snake, blue-ringed octopus and land animals such as Gang-gang cockatoo, Emu, eastern brown snake, tiger snake,wolf spider, wedge-tailed eagle, banjo frog and Blue-tongued skink, here is the list of unique wild animals of Australia. *from walkthroughindia.com*

Kangaroo

Kangaroos are unofficially Australia's national animal and describe as the largest species from his family. The Kangaroos are endemic to Australia and one of the species of red kangaroo are known as largest surviving marsupial of the world.

Koala

Koala is a tree herbivorous animal native to Australia, mostly found in coastal areas Queensland and Victoria. Koalas are symbol of Australia country but due to habitat destruction and hunting, the animal is a vulnerable species.

Echidna

Echidna are spiny anteaters and one of the egg-laying mammals and one of the rarest animals in the world. The Echidna has sharp spine like a big porcupine and one of the surviving members of the monotreme species.

Platypus

Platypus is another egg-laying mammal endemic to semiaquatic area of Australia. The Platypus are combination of duck, beaver and otter,also one of the known venomous mammals in the world.

Wombat

Wombats are native to Australia, mostly found in mountainous areas of south Australia. Wombats species are protected in Australia and Epping Forest National Park is one of the best place in the country to spot species of Wombat.

Macrotis

Macrotis are one of the endangered animal species in Australia and one of the shortest among mammals in the world. Greater bilby or Macrotis is the largest of the other small Macrotis and lesser bilby became extinct from Australia.

Wallaby

Wallabies are small kangaroo found in Australia and the smallest member of kangaroo family. The wallaby are medium sized marsupial and one of the two species are endangered because of hunting for meat and fur.

Sugar Glider

Sugar Glider is a small marsupial found throughout mainland of Australia. The sugar glider are arboreal omnivores,live in family groups and one of the most commonly traded wild animal.

Tiger Quoll

Tiger Quoll are carnivorous animal,native to mainland Australia and Tasmania. The tiger quoll are largest and the world's longest species of marsupial and a living carnivorous.

Cane Toad

The cane toads of Australia are also known as giant neotropical toad and has been introduced in the country. Cane toads are highly toxic in nature and one of the largest of the frogs and toads found in Australia.

Thorny Dragon

Thorny Devil Dragon is the only species of devil lizard found in Australia. The thorny dragon is a small species of lizard and known for their defenses against predators.

Inland Taipan

Inland Taipan is the world's most venomous land snake,living in regions of central east Australia. The inland taipan is an extremely venomous snake based on its venom and has the most toxic venom of any other reptiles in the world.

Tasmanian Devil

Tasmanian Devil are the carnivorous animal found only in the wild forest of Australian island. The Tasmanian devil are among known for the strongest bite per unit body mass of any other land predator.

Goanna

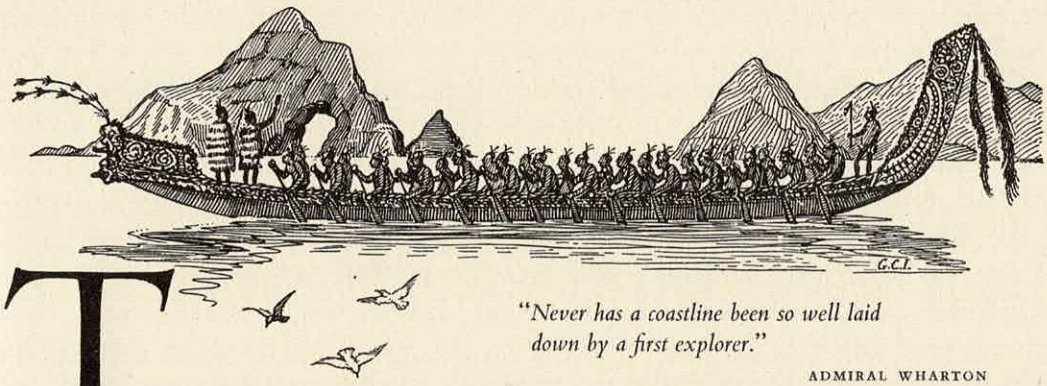
Australian Goannas are monitor lizards and fourth-largest living lizard found on earth. The perentie is the largest monitor lizard, mostly found in the desert areas of Western Australia.

Dingo

Dingo is Australia's wild dog but a separate species from dog found in deserts and grasslands of Australia. Dingo wild dogs are the largest terrestrial predator in the country but listed as vulnerable to extinction.

Chapter V

NEW ZEALAND, 1769-70



"Never has a coastline been so well laid down by a first explorer."

ADMIRAL WHARTON

THE *ENDEAVOUR* HAD NOW SAILED THROUGH THE EASTERN part of the mythical Southern Continent in her voyage from Cape Horn to Tahiti, and she had shown in her southern sweep from Tahiti that the supposed northern shores of the continent were non-existent in that locality. The exploration of New Zealand would decide whether or not this land formed the western coast of the continent. Land was seen on the 7th of October, by a boy, Nicholas Young, and the S.W. point of Poverty Bay was named 'Young Nick's Head'. Cook then sailed into the Bay, which he first named 'Endeavour Bay' and later 'Poverty Bay' because 'it afforded us no one thing we wanted'. The expedition at once encountered trouble with the warlike Maoris.

SATURDAY *7th* October. *Latd in South* 38° 57′. *Longd in West* 177° 54′. Gentle breezes and settled weather. At 2 PM saw land from the mast head bearing WBN, which we stood directly for, and could but just see it at sun set.

MONDAY *9th* October. I went ashore with a party of men in the Pinnace and yawl accompaned by Mr Banks and Dr Solander, we land[ed] abreast of the Ship and on the east side of the river just mentioned, but seeing some of the natives on the other side of the river whome I was desirous of speaking with and finding that we could not ford the river, I order'd the yawl in to carry us over and the Pinnace to lay at the entrance. In the mean time the Indians made off; however we went as far as their hutts which lay about 2 or 3 hundred yards from the water side leaving four boys to take care of the yawl, which we had no sooner left than four men came out of the woods on the other side the river and would

certainly have cut her off, had not the people in the pinnace discover'd them and called to her to drop down the stream which they did being closely pursued by the Indians; the Coxswain of the pinnace who had the charge of the Boats, seeing this fire'd two musquets over their heads, the first made them stop and look round them, but the 2d they took no notice of upon which a third was fired and killed one of them upon the spot just as he was going to dart his spear at the boat; at this the other three stood motionless for a minute or two, seemingly quite surprised wondering no doubt what it was that had thus killed their commorade: but as soon as they recover'd themselves they made off draging the dead body a little way and then left it.

¶ Cook and Banks were deeply grieved at an even more serious incident the following day.

TUESDAY 10*th* October. PM I rowed round the head of the Bay but could find no place to land, on account of the great surff which beat every where upon the shore; seeing two boats or Canoes coming in from Sea, I rowed to one of them in order to seize upon the people and came so near before they took notice of us that Tupia called to them to come along side and we would not hurt them, but instead of doing this they endeavoured to get away, upon which I order'd a Musquet to be fire'd over their heads thinking that this would either make them surrender or jump over board, but here I was misstaken for they immidiately took to thier arms or whatever they had in the boat and began to attack us, this obliged us to fire upon them and unfortunatly either two or three were kill'd, and one wounded, and three jumped over board, these last we took up and brought on board, where they were clothed and treated with all immaginable kindness and to the surprise of every body became at once as cheerful and as merry as if they had been with their own friends; they were all three young, the eldest not above 20 years of age and the youngest about 10 or 12.

'I am aware that most humane men who have not experienced things of this nature will cencure my conduct in fireing upon the people in this boat nor do I my self think that the reason I had for seizing upon her will att all justify me, and had I thought that they would have made the least resistance I would not have come near them, but as they did I was not to stand still and suffer iether my self or those that were with me to be knocked on the head.

WEDNESDAY 11*th* October. In the PM as I intended to sail in the morning we put the three youths ashore seemingly very much againest their inclination, but whether this was owing to a desire they had to remain with us or the fear of falling into the hands of their eminies as they pretended I know not; the latter however seem'd to be ill founded for we saw them carried aCross the river in a Catamaran and walk leasurely off with the other natives.

'At 6 AM we weigh'd and stood out of the Bay which I have named *Poverty Bay* because it afforded us no one thing we wanted.

¶ From Poverty Bay Cook sailed south, naming Hawke Bay after the First Lord of the Admiralty, but, as he found no good harbour and poor country, he turned north and began to circumnavigate the North Island in an anti-clockwise direction. They passed the Bay of Plenty and Mercury Bay where they observed the Transit of Mercury and where Cook was greatly impressed by the Pahs or fortified Maori villages. A long account of one of these includes the following:—

SATURDAY 11*th* November. A little with[in] the entrance of the river [the Mercury] on the East side is a high point or peninsula juting out into the River on which are the remains of one of thier Fortified towns, the Situation is such that the best Engineer in Europe could not have choose'd a better for a small number of men to defend themselves against a greater, it is strong by nature and made more so by Art. It is only accessible on the land side, and there have been cut a Ditch and a bank raised on the inside, from the top of the bank to the bottom of the ditch was about 22 feet and depth of the ditch on the land side 14 feet; its breadth was in proportion to its depth and the whole seem'd to have been done with great judgement. There had been a row of Pickets on the top of the bank and another on the outside of the ditch, these last had been set deep in the ground and sloaping with their upper ends hanging over the ditch; the whole had been burnt down, so that it is probable that this place has been taken and distroy'd by an Enimy.

¶ Relations with the Maoris varied. Sometimes muskets and even cannon were needed to deal with them; at other times they were most friendly—for example, on the River Thames, where the magnificent trees impressed Cook greatly.

TUESDAY 21*st* November. After land[ing] as above mentioned we had not gone a hundred yards into the Woods before we found a tree that girted 19 feet 8 Inches 6 feet above the Ground, and having a quadrant with me I found its length from the root to the first branch to be 89 feet, it was as streight as an arrow and taper'd but very little in proportion to its length, so that I judged that there was 356 solid feet of timber in this tree clear of the branches. We saw many others of the same sort several of which were taller than the one we measured and all of them very stout; there were likewise many other sorts of very stout timber-trees all of them wholy unknown to any of us. We brought away a few specimans and at 3 oClock we embarqued in order to return on board with the very first of the Ebb, but not before we had named this River the *Thames* on account of its bearing some resemblence to that river in england. In our return down the River the inhabitants of the Village where we landed in going, seeing that we return'd by a nother Channell put off in thier Canoes and met us and trafficked with us in the most friendly manner immagineable untill they had disposed of the few trifles they had.

¶ After passing Hauraki Gulf, and the future site of Auckland, the *Endeavour* entered the Bay of Islands, where, then, as at present, the Maori population was dense.

MONDAY 27*th* November. PM On the SW side of this Bay we saw several Villages situated both on Islands and on the Main land from whence came off to us several large Canoes full of people, but like those that had been along side before would not enter into a friendly traffick with us, but would cheat when ever they had an opertunity. The people in these Canoes made a very good appearence being all stout well made men, having all of them their hair which was black Comb'd up and tied upon the Crown of their heads and there stuck with white feathers, in each of the Canoes were two or three Cheifs and the habits of these were rather superior to any we had yet seen, the Cloth they were made on was of the best sort and cover'd on the out side with Dog skins put on in such a manner as to look agreeable enought to the Eye. Few of these people were tattow'd or mark'd in the face like those we have seen farther to the south, but several had their Backsides tattou'd much in the same manner as the Inhabitants of the Islands within the Tropics. In the Course of this Day, that is this afternoon and yester forenoon, we reckoned that we had not less than four or five hundred of the Natives alongside and on board the Ship, and in that time did not rainge above 6 or 8 Leagues of the Sea-Coast, a strong proff that this part of the Country must be well inhabited.

¶ In his dealings with the members of his crew and the natives Cook was scrupulously just.

THURSDAY 30*th* November. PM had the winds Westerly with some very heavy showers of rain. We had no sooner come to an Anchor than between 3 and 4 hundred of the Natives Assembled in their Canoes about the Ship, some few were admited on board and to one of the Chiefs I gave a piece of Broad Cloth and distributed a few nails &c^{a} a Mongest some others of them. Many of these people had been off to the Ship when we were at sea and seem'd to be very sencible of the use of fire arms and in the little trade we had with them they behaved tollerable well, but continued not long before some of them wanted to take away the Buoy and would not desist at the fireing of several Musquets untill one of them was hurt by small shott, after which they withdrew a small distance from the Ship . . . I sent the Master with two Boats to sound the harbour, but before this I order'd Math^{w} Cox, Hen^{ry} Stevens and Man^{l} Paroyra to be punished with a doz^{n} lashes each for leaving thier duty when a shore last night and diging up Potatous out of one of the Plantations, the first of the three I remited back to confinement because he insisted that their was no harm in what he had done. All this fore noon had abundance of the Natives about the Ship and some few on board, we trafficked with them for a few trifles in which they dealt very fair and friendly.

¶ In early December came an incident which illustrated the constant dangers of navigation on an unknown coast.

WEDNESDAY 6*th* December. PM had a gentle breeze at NNW, with which we kept turning out of the Bay but gaind little or nothing, in the evening it fell little wind and at 10 oClock it was Calm; At this time the tide or Current seting the Ship near one of the Islands, where we was very near being a shore but by the help of our boat and a light air from the southward we got clear; about an hour after when we thought our selves out of all danger the Ship struck upon a Sunken rock and went immidiatly clear without receiving any perceptible damage; just before the man in the chains had 17 fathom water and immidiatly after she struck 5 fathom, but very soon deepen'd to 20.

¶ Shortly after mid December and in very bad weather Cook passed and named North Cape and saw the Three Kings Island and Cape Maria Van Diemen which Tasman had discovered. He had now shown the probability of the Dutchman's contentions that, owing to the heavy swell from the north-west, there must be a passage from New Zealand and south-west across the Pacific. Continuing south Cook sighted and was immensely impressed by Mt. Egmont.

SATURDAY 13*th* January. At 5 AM saw for a few Minutes the Top of the peaked Mountain above the Clowds, bearing NE; it is of a prodigious height and its top is cover'd with everlasting snow. It lies in the Latitude of 39° 16′ S and in the Longitude of 185° 15′ W. I have named it *Mount Egmont* in honour of the Earl of Egmont. This mountain seems to have a pretty large base and to rise with a gradual assent to the peak and what makes it more conspicuous is, its being situated near the Sea, and a flat Country in its neighbourhood which afforded a very good asspect, being cloathed with Wood and Verdure.

MONDAY 15*th* January. The land seen than bearing S 63° West bore now N 59° West distant 7 or 8 Leag[s] and makes like an Island, between this land or Island and Cape Egmont is a very broad and deep Bay or Inlet the SW side of which we are now upon, and here the land is of a considerable height distinguished by hills and Vallies and the shore seems to form several Bays into one of which I intend to go with the Ship in order to Careen her (she being very foul) and to repair some few defects, recrute our stock of Wood, water &c[a] with this View we kept plying on and off al[l] night having from 80 to 63 fathoms water. At day light Stood in for an Inlet which runs in SW.

¶ The *Endeavour* now entered the great western opening of Cook Strait between the North and South Island—the strait whose existence Tasman had suspected but which he had failed to penetrate in 1642. Sailing in Cook encountered as the strait narrowed the northern fiord coast of the Southern Island, and here, he decided to stay in what was to prove his much beloved Queen Charlotte Sound, an inlet which provided timber, fresh water, and friendly natives.

¶ Admiral Wharton has pointed out that Cook had now effected, by an admirable mingling of 'audacity and caution', a brilliant survey of a most dangerous and stormy coastline together with 'extraordinarily accurate' observations of latitude and longitude.

¶ In Queen Charlotte Sound the Maoris, who were comparatively few, changed in attitude from hostility and stonethrowing to lukewarm friendliness. The whites were, however, horrified to find that they were enthusiastic cannibals.

WEDNESDAY 17*th* January. Soon after we landed we met with two or three of the Natives who not long before must have been regailing themselves upon human flesh, for I got from one of them the bone of the fore arm of a Man or a Woman which was quite fresh and the flesh had been but lately pick'd off which they told us they had eat, they gave us to understand that but a few days ago they had taken Kill'd and eat a Boats crew of their enemies or strangers, for I beleive that they look upon all strangers as enemies; from what we could learn the Woman we had seen floating upon the water was in this boat and had been drownded in the fray. There was not one of us that had the least doubt but what this people were Canabals but the finding this Bone with part of the sinews fresh upon it was a stronger proof than any we had yet met with, and in order to be fully satisfied of the truth of what they had told us, we told one of them that it was not the bone of a man but that of a Dog, but he with great fervency took hold of his fore-arm and told us again that it was that bone and to convence us that they had eat the flesh he took hold of the flesh of his own arm with his teeth and made shew of eating.—AM Careen'd scrubed and pay'd the Starboard side of the Ship: While this was doing some of the natives came along side seemingly only to look at us, there was a Woman among them who had her Arms, thighs and legs cut in several places, this was done by way of Mourning for her husband who had very lately been kill'd and eat by some of their enimies as they told us and pointed towards the place where it was done which lay some where to the Eastward. M[r] Banks got from one of them a bone of the fore arm much in the same state as the one before mention'd and to shew us that they had eat the flesh they bit a[nd] naw'd the bone and draw'd it thro' their mouth and this in such a manner as plainly shew'd that the flesh to them was a dainty bit.

¶ Later in the month Cook ascended the neighbouring hills and returned satisfied that he had discovered a strait running towards the east.

FRIDAY 26*th* January. In the AM I made an excursion into one of the Bays which lie on the East side of the Inlet accompanied by M[r] Banks and D[r] Solander, upon our landing we ascended a very high hill from which we had a full View of the passage I had before descover'd and the land on the opposite shore which appear'd to be about 4 Leagues from us, but as it was hazey near the horizon we could not see far to the SE. However, I had now seen enough of this passage to convence me that there was the greatest probabillty in the world of its runing

into the Eastern Sea as the distance of that Sea from this place cannot exceed 20 Leagues even to where we were, upon this I resolve'd after puting to sea to search this passage with the Ship.

℄ On the 31st January, Cook took formal possession of Queen Charlotte Sound and the adjacent lands and made further enquiries from the Maoris which strengthened his belief that New Zealand consisted of islands and was not part of a continent.

WEDNESDAY 31*st* January. I next, by means of Tupia, explained to the old man and several others that we were come to set up a mark upon the Island in order to shew to any ship that might put into this place that we had been here before, they not only gave their free consent to set it up, but promise'd never to pull it down. I then gave to every one present one thing or a nother, to the old men I gave silver threepenny peices dated 1763 and spike nails with the Kings broad Arrow cut deep in them things that I thought were most likely to remain long among them.

'After I had thus prepare'd the way for seting up the post we took it up to the highest part of the Island and after fixing it fast in the ground hoisted thereon the Union flag and I dignified this Inlet with the name of *Queen Charlottes Sound* and took formal posession of it and the adjacent lands in the name and for the use of his Majesty, we then drank Her Majestys hilth in a Bottle of wine and gave the empty bottle to the old man (who had attended us up the hill) with which he was highly pleased. Whilest the post was seting up we asked the old man about the *Strait* or passage into the Eastern Sea and he very plainly told us that there was a passage and as I had some conjectors that the lands to the SW of this strait (which we are now at) was an Island and not part of a continent we questioned the old man about it who said that it consisted of two *Wannuaes*, that is two lands or Islands that might be circumnavigated in a few days, even in four.

℄ On leaving Queen Charlotte Sound the *Endeavour* sailed eastwards through Cook Strait where the currents nearly wrecked the ship.

WEDNESDAY 7*th* February. In the PM had a light breeze at NBW with which we got out of the Sound and stood over to the eastward in ord[er] to get the Strait well open before the tide of ebb made. At 7 the two small Island[s] which lies off Cape Koameroo or the SE head of Queen Charlottes Sound bore East distant 4 Miles. At this time we had it nearly calm and the tide Ebb makeing out we were carried by the rapiddity of the stream in a very short time close upon one of the Islands where we narrowly escaped being dashed againest the rocks by bringing the Ship to an Anchor in 75 fathom water with 150 fathoms of Cable out; even this would not have save'd us had not the tide, which first set SBE, by meeting with the Island changed its dire[c]tion to SE and carried us past the first point. When the Ship was brought up she was about two Cables lengths of the rocks and in the strength of the stream which set SE at least 4 or 5 Knotts or miles an hour.

¶ When Cook reached the open ocean, some of his officers expressed the opinion that the coast of the North Island between Cook's Strait and Cape Turnagain might be connected with a continent lying to the east, so Cook sailed north to Cape Turnagain to settle the matter.

THURSDAY 8*th* February. From this Cape we steer'd along shore SWBS untill 8 oClock when the wind died away, but an hour after a fresh breeze sprung up at SW and we put the Ship right before it. The reasons for my doing this was owing to a notion which some of the officers had just started that *Aeheinomouwe* was not an Island, founding their opinion on a suppotision that the land might extend away to the SE from between Cape Turn-again and Cape Pallisser, there being a space of about 12 or 15 Leagues which we had not seen. For my own part I had seen so far into this Sea the first time I discover'd the Strait, together with many other concurrent testimonies of its being an Island that no such supposition ever enter'd my thoughts, but being resolved to clear up every doubt that might arise on so important an object I took the oppertunity of the shifting of the wind to stand to the Eastward and accordingly steer'd NEBE all night.

FRIDAY 9*th* February. We continued our Course along shore to the NE untill 11 oClock AM when the weather clearing up we saw Cape Turn-again bearing NBE¼E distant 7 Leagues. I then called the officers upon deck and asked them if they were now satisfied that this land was an Island to which they answer'd in the affirmative.

¶ Cook now turned and circumnavigated the South Island of New Zealand in a clockwise direction. On four occasions foul weather drove him out of sight of land, but he completed his task in under seven weeks, although this part of the voyage lacked the frequent landings and picturesque accounts given during the four months spent in circling the North Island. By 8th March he was able to change his course to south-west for it was becoming clear that New Zealand was a group of islands and not part of a great southern continent. He could now write:

SATURDAY 10*th* March. At sunset the Southermost point of land which I afterwards named *South Cape* and which lies on the Lat^{de} 47° 19′ S, Long^{d} 192° 12′ West from Greenwich bore N 38° E distant 4 Leagues and the westermost land in sight bore N 2° East, this last was a small Isl^{d} lying off the point of the Main. I began now to think that this was the southermost land and that we should be able to get round it by the west, for we have had a large hollow swell from the SW ever sence we had the last gale of wind from that quarter which makes me think that there is no land in that direction.

¶ Cook now worked northwards along the rugged fiord coast of the south-west with its backing of the Southern Alps, and then followed Tasman's bush-covered shoreline to Admiralty Bay and Cape Farewell, where he left New Zealand for the East Australian coast.

FRIDAY 23*rd* March. Having now nearly run down the whole of this NW Coast [of] *Tovypoenammu* it is time I should discribe the face of the Country as it hath at different times appeard to us. I have mentioned on the 11th Instant at which time we were off the Southern part of the Island, that the land seen than was Ruged and Mountainous and there is great reason to beleive that the same ridge of Mountains extends nearly the whole length of the Island. From between the Westermost land seen that day and the Eastermost seen on the 13th there is a space of about 6 or 8 Leagues of the Sea Coast unexplored but the mountains inland were Visible enough. The land near the Shore about *Cape West* is rather low and riseth with a gradual assent up to the foot of the mountains and appear'd to be mostly cover'd with Wood; from *Point five fingers* down to the Latitude of 44° 20′ there is a narrow ridge of hills rising dire[c]tly from the sea which are cloathed with wood. Close behind these hills lies the ridge of Mountains which are of a prodigious height and appear to consist of nothing but barren rocks, cover'd in many places with large patches of snow which perhaps have laid their sence the creation. No country upon earth can appear with a more ruged and barren aspect than this doth from the sea for as far inland as the eye can reach nothing is to be seen but the sumits of these Rocky mountains which seem to lay so near one another as not to admit any Vallies between them. From the Latitude of 44° 20′ to the Latitude 42° 8′ these mountains lay farther inland. The Country between them and the Sea consists of woody hills and Vallies of various extent both for height and depth and hath much the appearence of fertility, many of the Vallies are large low and flat and appeard to be wholy cover'd with Wood but it is very probable that great part of the land is taken up in Lak[e]s Ponds &c[a] as is very common in such like places. From the last mentioned Latitude to *Cape Farewell*, (afterwards so call'd) the Land is not distinguished by anything remarkable, it riseth into hills directly from the sea and is cover'd with wood. While we were upon this part of the coast the weather was foggy in so much that we could see but a very little way in land, however we sometimes saw the summits of the Mountains above the fogg and clowds which plainly shew'd that the inland parts were high and Mountainous and gave me great reason to think that thier is a continued chain of Mountains from the one end of the Island to the other.

¶ Cook had now fulfilled his instructions and could sail back to England by any route which he thought fit. He wished to return by Cape Horn in order to prove or disprove the existence of a continent to the south of his outward route, but the *Endeavour* was in no state for such a voyage in high latitudes. The Cape of Good Hope route offered similar disadvantages and no prospects for exploration, so he decided to refit in the East Indies, sailing thither by the unknown East Coast of New Holland and the lands which Quiros had discovered. His officers agreed with this brilliant and momentous decision.

SATURDAY 31*st* March. Upon my return to the Ship in the evening I found the water &c[a] all on board and the Ship ready for sea and being now resolved to quit this country altogether and to bend my thoughts towards returning home by such a rout as might conduce most to the advantage of the service I am upon, I consulted with the officers upon the most eligible way of puting this in execution. To return by the way of *Cape Horn* was what I most wish'd because by this rout we should have been able to prove the existence or non existence of a Southern Continent which yet remains doubtfull; but in order to ascertain this we must have kept in a high latitude in the very depth of winter but the condition of the ship in every respect was not thought sufficient for such an undertaking. For the same reason the thoughts of proceeding directly to the Cape of Good Hope was laid a side especialy as no discovery of any moment could be hoped for in that rout. It was therefore resolved to return by way of the East Indies by the following rout: upon leaving this coast to steer to the westward untill we fall in with the East Coast of New Holland and than to follow the deriction of that Coast to the northward or what other direction it may take untill we arrive at its northern extremity, and if this should be found impractical than to endeavour to fall in with the lands or Islands discover'd by Quiros.

NEW ZEALAND AND THE MAORIS

¶ Under the heading of 31st March, the day before he left New Zealand, Cook gave a most interesting account of the islands and their picturesque cannibal inhabitants. The following extracts also show that he was not merely an explorer, but an empire builder who looked towards the possibilities of future British settlement.

SATURDAY 31*st* March. Before I quit this land altogether I shall give a short and general discription of the Country, its inhabitants their manners, Customs &c[a] in which it is necessary to observe that many things are founded only on Conjector for we were too short a time in any one place to learn much of their interior policy and therefore could only draw conclutions from what we saw at different times.

'Part of the East Coast of this Country was first discover'd by *Abel Tasman* in 1642 and by him calld *New Zeland*, he however never landed upon it probably he was discouraged from it by the natives killing 3 or 4 of his people at the first and only place he anchor'd at. This country, which before now was thought to be a part of the imaginary southern continent, co[n]sists of Two large Islands divided from each other by a strait or passage of 4 or 5 Leagues broad. They are Situated between the Latitudes of 34° and 48° s and between the Longitude of 181° and 194° West from the Meridion of Greenw[h]. The situation of few parts of the world are better determined than these Islands are being settled by some

hundreds of Observations of the Sun and Moon and one of the transit of Mercury made by M^r^ Green who was sent out by the Roy^l^ Society to observe the Transit of Venus.

'The Northermost of these Islands, as I have before Observed is call'd by the Natives *Aehei no mouwe* and the Southermost *Tovy Poenammu*, the former name we were well assurd comprehended the whole of the Northern Island, but we were not so well satisfied with the latter whether it comprehended the whole of the Southern Island or only a part of it. This last according to the accounts of the Natives of Queen Charlottes Sound ought to consist of two Il^ds^ one of which at least we were to have saild round in a few days, but this was not verify[ed] by our own observations. I am inclinable to think that they know'd no more of this land than what came within the limets of their sight. The Chart which I have drawn will best point out the figure and extent of these Islands, the situation of the Bays and harbours they contain and the lesser Islands lay about them. . . . Mention is likewise made in the Chart of the appearence or Aspect of the face of the Country. With respect to *Tovy poenammu* it is for the most part of a very Mountainous and to all appearences a barren Country. The people in Queen Charlottes Sound, those that came off to us from under the Snowey Mountain and the fire we saw to the sw of Cape Saunders were all the inhabitants or signs of inhabitants we saw upon the whole Island. But most part of the Sea Coast of *Aeheinomouwe* except the sw side is well inhabited and altho it is a hilly mountainous Country yet the very hills and mountains are many of them cover'd with wood, and the Soil of the planes and Vallies appeared to be rich and fertile and such as we had an oppertunity to examine we found to be so in a high degree and not very much incumbered with woods; it was the opinion of every body on board that all sorts of European grain fruits Plants &c^a^ would thrive here. In short was this Country settled by an Industrus people they would very soon be supply'd not only with the necessarys but many of the luxuries of life. The Sea Bays and Rivers abound with a great varity of excellent fish the most of them unknown in England, besides Lobsters which were allow'd by every body to be the best they ever had eat, Oy[s]ters and many other sorts of shell fish all excellent in their kind. Sea and water fowles of all sorts are however in no great plenty, those known in Europe are Ducks, Shags, Gannets & Gulls all of which were eat by us and found exceeding good, indeed hardly any thing came amiss to us that could be eat by man. Land fowl are likewise in no great plenty and all of them except quals are I beleive unknown in Europe, these are exactly like those we have in England. The country is certainly destitute of all sorts of beasts either wild or tame except Dogs and Ratts, the former are tame and live with the people who breed and bring them up for no other purpose than to eat and ratts are so scarce that not only I but many others in the ship never saw one. Altho we have seen some few Seals and once a Sea Lyon upon this coast yet I beleive

that they are not only very scarce but seldom or ever come a shore, for if they did the natives would certainly find out some method of Killing them the Skins of which they no doubt would preserve for Clothing as well as the skins of Dogs and birds the only skins we ever saw among them. But they must sometimes get whales because many of their Patoo patoos are made of the bones of some such like fish and an orament they wear at their breasts (on which they set great Value) which we suppose'd to be made of the tooth of a whale and yet we know of no method or instrument they have to kill these animals.

'In the woods are plenty of excellent timber fit for all purposes excepting Ships Mast[s] and perhaps upon a close examination some might be found not improper for that purpose. There grows spontaneously every where a kind of very broad pladed grass like flags of the nature of hemp of which might be made the very best of Cordage Canvas &c[a]. There are of two sorts the one finer than the other, of these the natives make cloth, rope, lines, netts &c[a]. Iron ore is undoubtedly to be found here particularly about Mercury bay where we found great quantities of Iron sand, however we met with no ore of any sort neither did we ever see any sort of Metal with the natives. . . . Should it ever become an object of settleing this Country the best place for the first fixing of a Colony would be either in the River Thames or the Bay of Islands, for at either of these places they would have the advantage of a good harbour and by means of the former an easy communication would be had and settlements might be extended into the inland parts of the Country, for at a very little trouble and expence small Vessels might be built in the River proper for the Navigating thereof. . . . So far as I have been able to judge of the genius of these people it doth not appear to me to be attall difficult for Strangers to form a settleme[n]t in this Country. They seem to be too much divided among themselves to unite in opposing, by which means and kind and gentle usuage the Colonists would be able to form strong parties among them.

'The Natives of this Country are a strong raw boned well made Active people rather above than under the common size especialy the men, they are all of a very dark brown Colour with black hair, thin black beards and white teeth and such as do not disfigure their faces by tattowing &c[a] have in general very good features. The men generaly wear their hair long coombd up and tied upon the crown of their heads, some of the women wear it long and loose upon their Shoulders, old women especialy, others again wear it crop'd short: their coombs are some made of bone and others of wood, they sometimes wear them as an ornament stuck upright in thier hair. They seem to injoy a good state of hilth and many of them live to a good old age. Many of the old and some of the middle aged men have thier faces mark'd or tattow'd with black and some few we have seen who have had their buttocks thighs and other parts of their bodies mark'd but this is less common.

'One day a[t] Tolago I saw a strong proff that the women never appear naked at least before strangers. Some of us happen'd to land upon a small Island where several of them were naked in the water gathering Lobsters and Shell fish. As soon as they saw us some of them hid themselves among the rocks and the rest remain'd in the Sea untill they had made themselves aprons of the Sea weed and even than when they came out to us they shew'd manifest signs of Shame and those who had no method of hiding their nakedness would by no means appear before us. The women have all very soft Voices and may by that alone be known from the men. The makeing of Cloth and all other Domestick work is I beleive wholy done by them and the more labourous work such as builds Boats, Houses, Tilling the ground, fishing &c[a] by the Men. Both men and women wear oraments at their ears and about their necks. These are made of Stone, bone, Shells &c[a] and are variously shaped, and some I have seen wear human teeth and finger nails and I think we were told that they did belong to thier deceas'd friends. The men when they are dress'd generaly wear two or three long white feathers stuck upright in their hair and at Queen Charlottes sound many both men and women wore round Caps made of black feathers. . . . When ever we were Viseted by any number of them that had never heard or seen any thing of us before they generaly came off in the largest Canoes they had, some of which will carry 60, 80 or 100 people, they always brought their best close along with them which they put on as soon as they came near the Ship. In each Canoe were generaly an Old man, in some two or three, these use'd always to dire[c]t the others, were better Clothed and generaly carried a halbard or battle ax in their hands or some such like thing that distinguished them from the others. As soon as they came within about a stones throw of the Ship they would there lay and call out *Haromai hareuta a patoo age*, that is come here, come a shore with us and we will kill you with our patoo patoo's, and at the same time would shake them at us, at times they would dance the war dance, and other times they would trade with and talk to us and answer such questons as were put to them with all the Calmness emaginable and then again begin the war dance, shaking their paddles patoo patoo's &c[a] and make strange contorsions at the same time, and as soon as they had worked themselves up to a proper pitch they would begin to attack us with stones and darts and oblige us whether we would or no to fire upon them. Musquetary they never regarded unless they felt the effect but great guns they did because these threw stones farther than they could comprehend. After they found that our Arms were so much Superior to theirs and that we took no advantage of that superiority and a little time given them to reflect upon it they ever after were our very good friends and we never had an Instance of their attempting to surprize or cut off any of our people when they were ashore, oppertunities for so doing they must have had at one time or a nother.

'It is hard to account for what we have every w[h]ere been told of their eating their enimies kill'd in battle which they most certainly do, circumstance enough we have seen to convince of the truth of this. Tupia who holds this custom in great aversion hath very often argued with them against it but they always as strenuously supported it and never would own that it was wrong. It is reasonable to suppose that men with whome this Custom is found seldom or never give quarter to those they overcome in battle and if so they must fight desperatly to the very last. A strong proff of this supposision we had from the people of Queen Charlottes Sound who told us but a few days before we arrived that they had kill'd and eat a whole boats crew; surely a single boats crew or at least a part of them when they found themselves beset and over powerd by number would have surrender'd themselves prisioners was such a thing practised among them. The heads of these unfortunate people they preserved as trophies; four or five of them they brought off to shew to us, one of which M[r] Banks bought or rather forced them to sell for they parted with it with the utmost reluctancy and afterwards would not so much as let us see one more for anything we could offer them. . . . The People shew great ingenuity and good workmanship in the building and framing their Boats or Canoes; the[y] are long and narrow and shaped very much like a New England Whale boat. Their large Canoes are I beleive built wholy for war and will carry from 40 to 80 or 100 men with their arms &c[a]. I shall give the demensions of one which I measured that lay a shore at *Tolaga*. Length 68½ feet, breadth 5 feet and depth 3½ feet. The bottom sharp inclining to a wedge and was made of three pieces hollow'd out to about 2 inches or an inch and a half thick and well fasten'd together with strong plating; each side consisted of one plank only which was 63 feet long and 10 to 12 Inches broad and about an inch and a quarter thick and these were well fited and lash'd to the bottom part; there were a number of Thwarts laid across and lashed to each gunel as a strengthening to the boat. The head orament projected 5 or 6 feet without the body of the Boat and was 4½ feet high; the stern orament was 14 feet high, about 2 feet broad and about an 1½ Inch thick, it was fix'd upon the Stern of the Canoe like the Stern post of a Ship upon her keel. The oraments of both head and stern and the two side boards were of carved work and in my opinion neither ill designed nor executed. All their Canoes are built after this plan and few are less than 20 feet long—some of the small ones we have seen with out-riggers but this is not common. . . . The tools with which they work in building their Canoes houses &c[a] are adzes or axes some made of a hard black stone, and others of green Talk; they have chisels made of the same but these are more commonly made of human bones. In working small work and carving I believe they use mostly peices of Jasper breaking small peices from a large lump they have for that purpose. As soon as the small peice is blunted they throw it a way and take another. To till or turn up the ground they have wooden

spades (if I may so call them) made like stout pickets with a peice of wood tyed aCross near the lower end to put the foot upon to force them into the ground. There green talk axes that are whole and good they set much value upon and never wold part with them for any thing we could offer. I offer'd one day for one, one of the best axes I had in the Ship besides a number of other things but nothing would induce the owner to part with it: from this I infer'd that good ones were scarce among them. . . . We were never able to learn with any degree of certainty in what manner they bury their dead, we were generaly told that they put them in the ground, if so it must be in some secrete or by place for we never saw the least signs of a burying place in the whole Country. Their Custom of Mourning for a friend or a relation is by cuting and scarifying their bodies particularly their Arms and breasts in such a Manner that the scars remain indelible and I beleive have some signification such as to shew how near related the deceas'd was to them.

'With respect to Religion I beleive these People trouble themselves very little about it. They however beleive that their is one Supream God whome they call Tane and likewise a number of other inferior Deities, but whether or no they Worship or Pray to either one or the other we know not with any degree of certainty. It is reasonable to suppose that they do and I beleive it, yet I never saw the least action or thing a mong them that tended to prove it.

'They have the same notions of the Creation of the World Mankind &c[a] as the People of the South Sea Islands have, indeed many of there Notions and Customs are the very same, but nothing is so great a proff of they all having had one Source as their Language which differs but in a very few words the one from the other . . . There are some small difference in the Language spoke by the *Aehei-no mouweans* and those of *Tovy poe nammu* but this difference seem'd to me to be only in the pronunciation and is no more than what we find between one part of England and another: what is here inserted as a specemen is that spoke by the People of *Ae hei no mouwe*. What is meant by the South Sea Islands are those Islands we our selves touch'd at, but I gave it that title because we have a[l]ways been told that the same Language is Universally spoke by all the Islanders and this is a sufficient proff that both they and the New Zelanders have had one Origin or Source but where this is, even time perhaps may never discover. It certainly is neither to the Southward nor Eastward for I cannot preswaid my self that ever they came from America.

¶ Although in his rapid survey Cook made the mistake of thinking that Bank's Peninsula was an island and Stewart Island a peninsula, he could now complete a very fine map. He had given the islands 'a sure and defined outline'. It is only just to say that Cook had 'found New Zealand a line on the map and left it an Archipelago'. In this region at least he had dispelled the myth of the Southern Continent which he dismissed as follows.

SATURDAY 31*st* March. As to a Southern Continent I do not beleive any such thing exists unless in a high Latitude, but as the Contrary oppinion hath for many years prevaild and may yet prevail it is necessary I should say some thing in support of mine more than what will be dire[c]tly point out by the track of this Ship in those seas; for from that alone it will evidently appear that there is a large space of Sea extending quite to the Tropick in which we were not or any other before us that we can aver for certain. In our rout to the northward after doubling Cape Horn when in the Latitude of 40° we were in the Longitude of 110°, and in our return to the Southward after leaving Ulietea when in the same Latitude we were in the Longitude of 145°; the difference in this Latitude is 35°. In the Latitude of 30° the difference of the two tracks is 21° and that difference continues as low as 20° but a view of the Chart will best illusterate this. Here is now room enough for the North Cape of the Southern Continent to extend to the Northward even to a pretty low Latitude. But what foundation have we for such a Supposision, none that I know of but this that it must be either here or no where.

'Geographers have indeed laid down part of *Quiros's* discoveries in this Longitude and have told us that he had their signs of a Continent a part of which they have actually laid down in their Maps but by what authority I know not. *Quiros* in the Latitude of 25° or 26° s discover'd Two Islands which I Suppose may lay between the Longitudes of 130° and 140° West. *Dalrymple* lays them down in 146° w and says that Quiros saw to the Southward very large hanging clowds and a very thick horizon, with other known signs of a Continent: other accounts of the Voyage says not a word about this but supposing it to be true, hanging Clowds and a thick horizon are certainly no known Signs of a Continent, I have had ma[n]y proofs to the contrary in the Course of this Voyage, neither do I beleive that Quiros himself looked upon such things as known signs of land, for if he had he certainly would have stood to the Southward in order to have satisfied himself before he had gone to the northward for no man seems to have had discoveries more at heart than he had; besides this was the ultimate object of his Voyage. If Quiros was in the Latitude of 26° and Longitude 146° west than I am certain that no part of the Southern continent can no where extend so far to the Northward as the above mentioned Latitude. But the Voyage which seems to thrust it farthest back in the Longitude I am speaking of viz. betwixt 130° and 150° West, is that of *Admiral Roggeween* a Dutch man made in 1722, who after leaving *Juan Fernandes* went in search of *Davis's Island*, but not finding it he ran 12° More to the West and in the Latitude of 28½° discover'd *Easter Island*. Dalrymple and some others have laid it down in 27° s & 106° 30′ West and supposes it to be the same as *Davis's Isle* which I think cannot be from the circumstance of the Voyage. On the other hand *M. Pingre* in his Treatise concerning the Transit of Venus gives an extract of Roggeween's Voyage and a

Map of the *South Seas*, where in he place[s] *Easter Island* in the Latitude of 28½° s and in the Longitude of 123° West. His reasons for so doing may be seen at large in the said treatise, he like wise lays down *Roggeween's* rout thro' these Seas very different from any other author I have seen, for after leaving *Easter Island* he makes him to steer SW to the height of 34° South and afterwards WNW. If *Roggeween* realy took this rout than it is not probable that there is any main land to the Northward of 35° South. However Mr Dalrymple and some Geographers have laid down *Roggeween's* track very different from *M. Pingre*. From *Easter Isle* they have laid down his track to the NW and afterwards very little different from that of *Le Maire*, and this I think is not probable that a Man who at his own request was sent to discover the Southern Continent should take the same rout thro' these Seas as others had done before who had the same thing in View, by so doing he most be morally certain of not finding what he was in search of and of course must fail as they had done. Be this as it may it is a point that cannot be clear'd up from the published accounts of the Voyage which so far from takeing proper Notice of their Longitude have not even mentioned the Latitude of several of the Islands they discover'd so that I find it impossible to lay down *Roggeween's* rout with the least degree of accuracy.

'But to return to our own Voyage which must be allow'd to have set a side the most if not all the arguments and proofs that have been advance'd by different Authors to prove that there must be a Southern Continent, I mean to the northward of 40° s for what may lay to the Southward of that Latitude I know not. Certain it is that we saw no visible signs of land, according to my opinion, neither in our rout to the Northward, Southward or Westward untill a few days before we made the east Coast of *New-Zeland*. It is true we have often seen large flocks of Birds but they were generaly such as are always seen at a very great distance from land, we likewise saw frequintly peices of Sea or rock weed, but how is one to know how far this may drive to Sea. I am told and that from undoubted Authority that there is yearly thrown up upon the Coast of Ireland a sort of Beans call'd Ox Eys which are known to grow no where but in the West Indias and yet these two places are not less than [11 or 1200] Leagues asunder; was such things found floating upon the water in the South Seas one would hardly be perswaided that one was even out of sight of land so apt are we to catch at every thing that may in the least point out to us the favourat object we are in persute of and yet experience shews that we may be as far from it as ever.

'Thus I have given my Opinion freely and without prejudicy not with any view to discourage any future attempts being made towards discovering the *Southern Continent*, on the Contrary, as this Voyage will evidently make it appear that there is left but a small space to the Northward of 40° where the grand Object can lay, I think it would be a great pitty that this thing which at times has been

the object of many ages and Nations should not now be wholy clear'd up, which might very easily be done in one Voyage without either much trouble or danger or fear of misscarrying as the Navigator would know where to go to look for it; but if after all no Continent was to be found than he might turn his thoughts towards the discovery of those multitude of Islands which we are told lay within the Tropical Regions to the South of the line, and this we have from very good Authority as I have before hinted. This he will always have in his Power, for unless he be directed to search for the Southern lands in a high Latitude he will not, as we were, be obliged to go farther to the westward in the Latitude of 40° than 140° or 145° West and therefore will always have it in his power to go to Georges Island where he will be sure of meeting with refreshments to rec[r]ute his people before he sets out upon the discovery of the Islands. But, should it be thought proper to send a ship out upon this service while *Tupia* lieves and he to come out in her, in that case she would have a prodigious advantage over every ship that had been upon discoveries in those seas before; for by means of Tupia, supposeing he did not accompany you himself, you would always get people to direct you from Island to Island and would be sure of meeting with a friendly reseption and refreshments at every Island you came to; this would inable the Navigator to make his discoveries the more perfect and compleat, at least it would give him time so to do for he would not be obliged to hurry through those seas from an apprehinsion of wanting provisions.

Geography
Oceania
New Zealand & Melanesia

Cycle 4, Week 5

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her (page 152–153, from W3).
2. Pass out new blackline map & reading, and colored pencils:
   - Oceania Physical Map (from Week 3)
   - Oceania Cities & Political Map—no coloring (from Week 4). ☺
   - Oceania Physical Blackline Map—to trace
   - Captain Cook, c. 5 (one for each family)
3. Key Verse.

Drill

1. New Zealand
   a. North Island
   b. South Isand
   c. Christchurch
   d. Auckland
2. Melanesia
   a. Coral Sea
   b. Solomon Islands
   c. Vanuatu
   d. Fiji
   e. Tonga
   f. New Caledonia

New Zealand & Melanesia

Turn to *Cartography* p. 152–153.

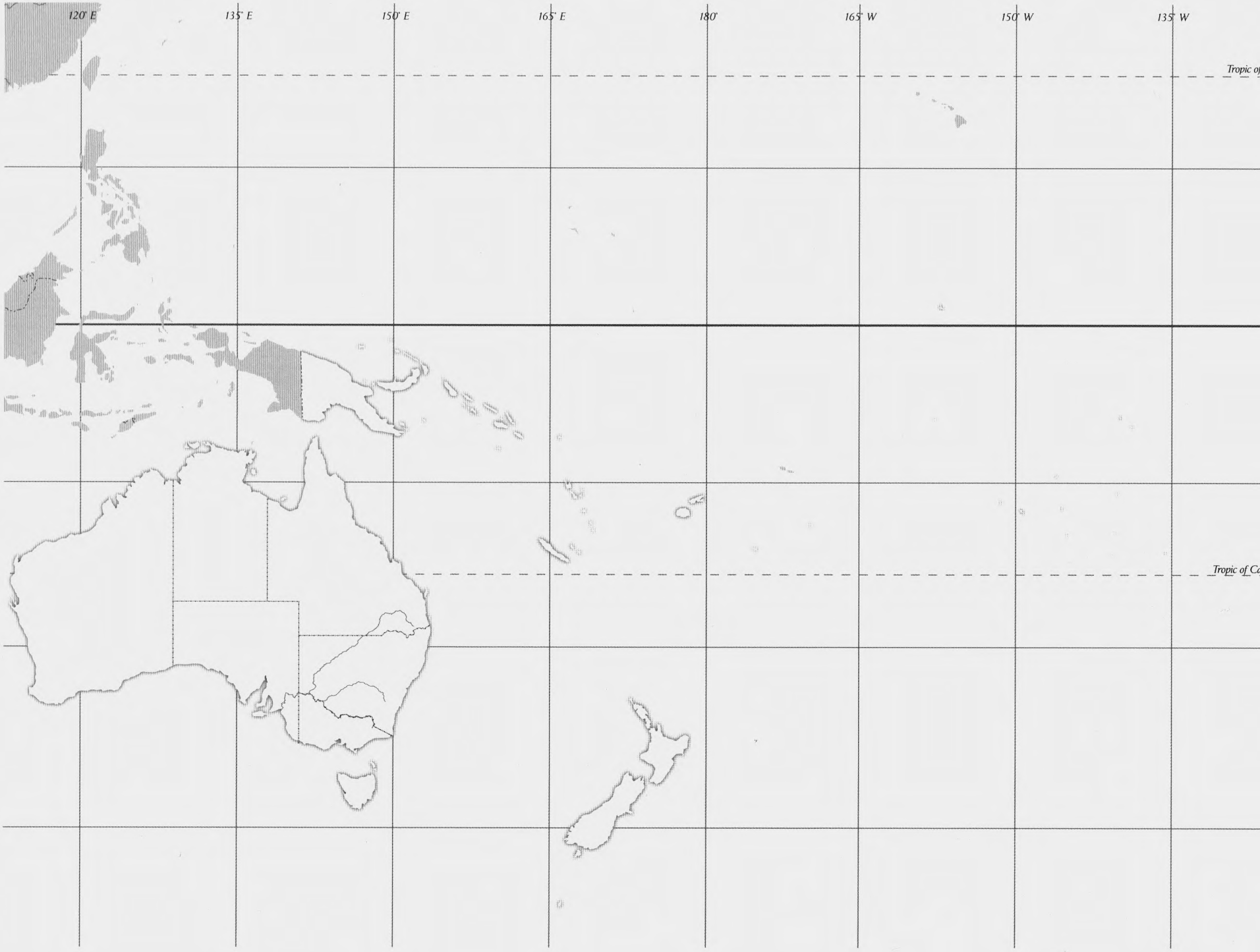
- The Pacific islands have unique plants and animals; the people of these lands were cannibals when Captain James Cook first explored them; but missionaries (some of whom were killed and eaten!) shared the Gospel with these people; and many of these islands, after receiving the glorious Gospel of our Lord Jesus Christ, became little places of paradise! Hawaii and Fiji are examples.
- Explain what an atoll is—a ring of coral surrounds an undersea volcano that has risen above the water's surface. Long after the volcano has receded into the ocean, the atoll remains. The habitat inside the atoll, protected from the open sea by the sturdy reef, is called a lagoon.

Geography

Learn More

- Read from the *Journal* of Captain James Cook, first voyage.
- Background: There was a *lot* about our world that was still unknown when Cook set sail. The knowledge of an inhabitable Antarctica had been handed down for centuries (since the time of the Ice Age after the Flood), so after discovering two huge unknown continents (North and South America), men wondered if there was a great Southern Continent west of South America, west of Cape Horn.
- Cook's voyage from Cape Horn to Tahiti (which he discovered), disproved that idea.
- Hold up the globe: When you look at how big the Pacific Ocean is, it is staggering! But see the route he took: from Cape Horn to Tahiti (the first land he encountered after Cape Horn). He records that he doubled Cape Horn on February 13, 1769, and set a north-westerly course; reaching Tahiti on April 11, 1769.
- Now, he was on to explore more of the Southern Hemisphere of our world.
- Read chapter 5, beginning on page 45 (as much as there is time for).

Drill Again


120° E
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165° E
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165° W
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Tropic of Ca

Geography
Oceania
New Zealand & Pacific Islands

Cycle 4, Week 6

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her. (If you don't have it, it's not that important.)
2. Map handouts and colored pencils (same from last week):
   - US Territories
   - Oceania Physical Map (from Week 3)
   - Oceania Cities & Political Map—no coloring (from Week 4). ☺
   - Oceania Cities & Political Blackline Map—to trace (from Week 5)
   - Captain Cook, c. 5 (one for each family)

To Start

1. Recite Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Samoa
2. Cook Islands
3. French Polynesia
   a. Tahiti
4. Easter Island
5. Micronesia (Caroline Islands)
6. Gilbert Islands (Kiribati is the Gilbertese spelling of Gilberts)
7. Marshall Islands
8. Mariana Trench
9. International Date Line
10. Wake Island
11. Hawaii

Geography

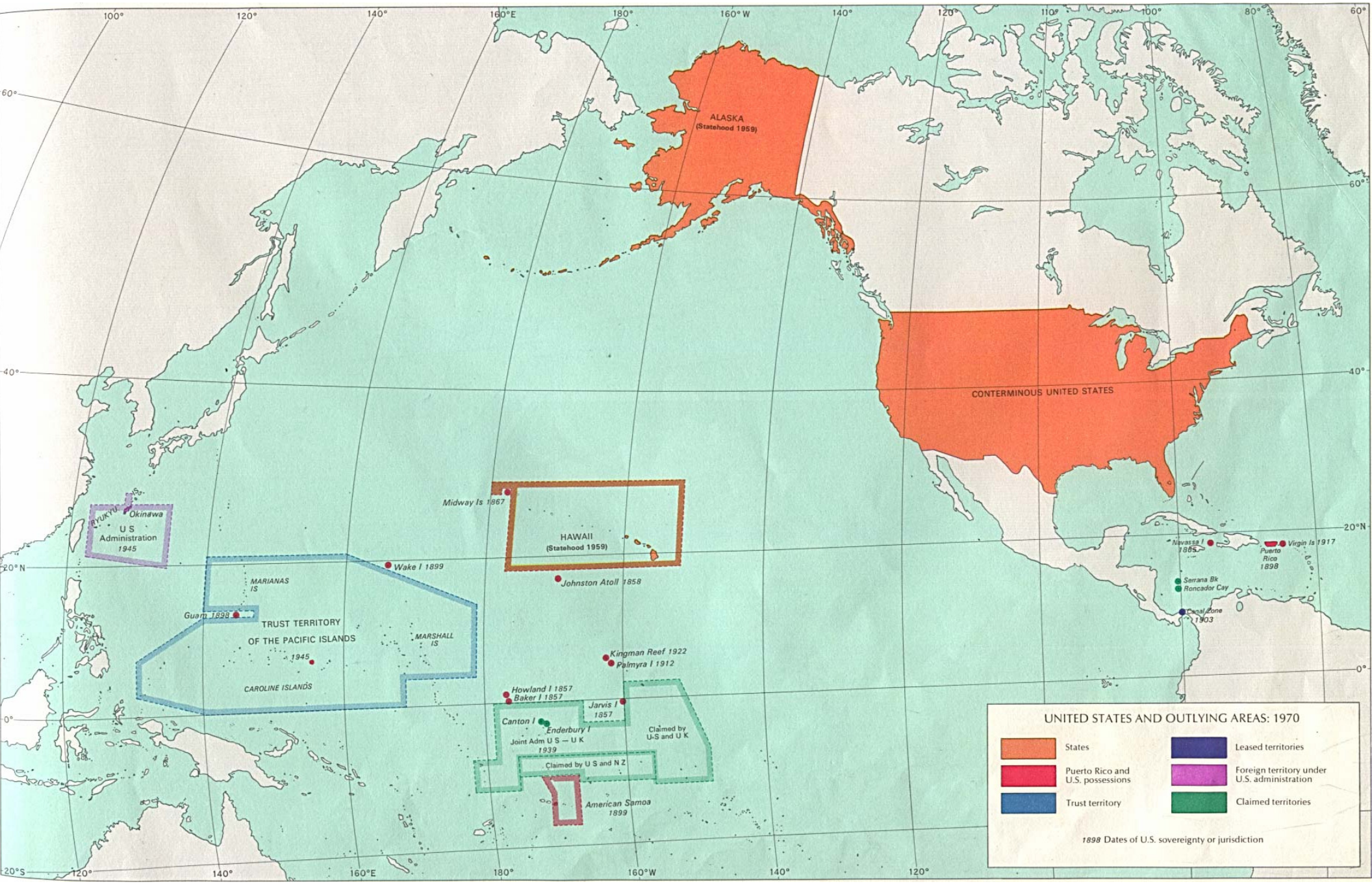
Learning: Unites States territories

- Puerto Rico (Caribbean)
- US Virgin Islands (Caribbean)
- Navassa Island (Caribbean)
- Guam
- Northern Mariana Islands
- American Samoa
- Midway (atoll)
- Palmyra (atoll)
- Baker Island
- Howland Island
- Jarvis Island
- Johnston (atoll)
- Kingman Reef
- Wake Island

Learn More

- Continue reading Captain Cook's Journal from last week, as time allows.

Drill Again


ALASKA
(Statehood 1959)
CONTERMINOUS UNITED STATES
HAWAII
(Statehood 1959)
Midway Is 1867
Johnston Atoll 1858
RYUKYU
Okinawa
U S
Administration
1945
MARIANAS
IS
Guam 1898
Wake I 1899
TRUST TERRITORY
OF THE PACIFIC ISLANDS
1945
MARSHALL
IS
CAROLINE ISLANDS
Kingman Reef 1922
Palmyra I 1912
Howland I 1857
Baker I 1857
Jarvis I
1857
Canton I
Enderbury I
Joint Adm U S — U K
1939
Claimed by
U-S and U K
Claimed by U S and N Z
American Samoa
1899
Navassa I
1865
Virgin Is 1917
Puerto
Rico
1898
Serrana Bk
Roncador Cay
Canal Zone
1903
100°
120°
140°
160°E
180°
160° W
140°
120°
110°
100°
80°
60°
40°
20°N
0°
20°S
UNITED STATES AND OUTLYING AREAS: 1970
States
Puerto Rico and
U.S. possessions
Trust territory
Leased territories
Foreign territory under
U.S. administration
Claimed territories
1898 Dates of U.S. sovereignty or jurisdiction

1r This is the first voyage and the courses and way that the Admiral Don Christóbal Colón took when he discovered the Indies, summarized except for the prologue that he composed for the king and queen, which is given in full and begins this way:[1]

In the Name of Our Lord Jesus Christ

Whereas,[2] Most Christian and Very Noble and Very Excellent and Very Powerful Princes, King and Queen of the Spains and of the Islands of the Sea, our Lords: This present year of 1492, after Your Highnesses had brought to an end the war with the Moors who ruled in Europe and had concluded the war in the very great city of Granada, where this present year on the second day of the month of January I saw the Royal Standards of Your Highnesses placed by force of arms on the towers of the Alhambra, which is the fortress of the said city; and I saw the Moorish King come out to the gates of the city and kiss the Royal Hands of Your Highnesses and of the Prince my Lord; and later in that same month, because of the report that I had given to Your Highnesses about the lands of India and about a prince who is called "Grand Khan," which means in our Spanish language "King of Kings"; how, many times, he and his predecessors had sent to Rome to ask for men learned in our Holy Faith in order that they might instruct him in it and how the Holy Father had never provided them; and thus so many peoples were lost, falling into idolatry and accepting false and harmful religions; and Your Highnesses, as Catholic Christians

1. (1r1–7) These preliminary lines, written in the third person, were undoubtedly added by Las Casas.
2. (1r9) This line starts well to the left of the balance of the text of folio 1r.

and Princes, lovers and promoters of the Holy Christian Faith, and enemies of the false doctrine of Mahomet and of all idolatries and heresies, you thought of sending me, Christóbal Colón, to the said regions of India to see the said princes and the peoples and the lands,
1v and the characteristics of the lands and of everything, and to see how their conversion to our Holy Faith might be undertaken. And you commanded that I should not go to the East by land, by which way it is customary to go, but by the route to the West, by which route we do not know for certain that anyone previously has passed. So, after having expelled all the Jews from all of your Kingdoms and Dominions, in the same month of January Your Highnesses commanded me to go, with a suitable fleet, to the said regions of India. And for that you granted me great favors and ennobled me so that from then on I might call myself "Don" and would be Grand Admiral of the Ocean Sea and Viceroy and perpetual Governor of all the islands and lands that I might discover and gain and [that] from now on might be discovered and gained in the Ocean Sea; and likewise my eldest son would succeed me and his son him, from generation to generation forever. And I left the city of Granada on the twelfth day of May in the same year of 1492 on Saturday, and I came to the town of Palos, which is a seaport, where I fitted out three vessels very well suited for such exploits; and I left the said port, very well provided with supplies and with many seamen, on the third day of August of the said year, on a Friday, half an hour before sunrise; and I took the route to Your Highnesses' Canary Islands, which are in the said Ocean Sea, in order from there to take my course and sail so far that I would reach the Indies and give Your Highnesses' message to those princes and thus carry out that which you had commanded me to do. And for this purpose I thought of writing on this

ernes .3. de agosto

whole voyage, very diligently, all that I would do and see and experience, as will be seen further along.[1] Also, my Lord Princes, besides writing down each night whatever I experience during the day and each day what I sail during the night, I intend to make a new sailing chart.[2] In it I will locate all of the
2r sea and the lands of the Ocean Sea in their proper places under their compass bearings and, moreover, compose a book and similarly record all of the same in a drawing, by latitude from the equinoctial line and by longitude from the west;[3] and above all it is very important that I forget sleep and pay much attention to navigation in order thus to carry out these purposes, which will be great labor.

Friday 3 August

We departed Friday the third day of August of the year 1492 from the bar of Saltés at the eighth hour. We went south with a strong sea breeze[4] 60 miles,[5] which is 15 leagues, until sunset; afterward to the southwest and south by west, which was the route for the Canaries.

1. (1v34–37) *Pense . . . veyra.* Events before and including the departure from Palos are referred to as past, while recording the voyage is a plan for the future. This suggests that the Prologue was written while the fleet was sailing to the Canary Islands.

2. (1v37–41) The syntax of this sentence (*Tambien Señores . . . navegar*) is not clear. Is "Columbus" the subject of two verbs in the future indicative tense (*passaré* and *navegaré*), or are *dia* and *noche* the subjects of verbs in the future subjunctive tense (*passare* and *navegare*) Because "Columbus" is the subject of the verbs in the two preceding lines (35 and 36) and because lines 38–40 appear intended to restate those lines, the first alternative is probably correct. With *el dia* and *la noche* read as adverbial phrases ("by day" and "by night"), the grammar would be correct.

3. (2r4–5) *Longitud del occidente. Occidente* is used here in the sense of an imaginary fixed line, probably *l'occidente di Tolomeo*, as the prime meridian on Ptolemaic maps was labeled.

4. (2r11) A *virazon* is a wind that regularly blows from the sea toward land during the day and from land toward sea at night. (See Guillén Tato 1951, 128.)

5. (2r12) *Millas.* The length of Columbus's mile is debated among scholars. Morison was so sure it was the Roman mile, of 4,850 feet, that he translated *millas* as "Roman miles" throughout his version of the *Diario.* Others assert that Columbus's mile is a shorter unit, of 5,000 palms, equivalent to about 4,060 English feet, or five-sixths of a Roman mile. All Iberian sailors of Columbus's time recognized 4 Roman miles as the equivalent of 1 Portuguese maritime league (see Kelley 1983, 91).

es .9. de otubre

s .10. de otubre

s .11º. de otubre

Tuesday 9 October

He steered southwest [and] made five leagues. The wind changed and he ran west by north[1] and made four leagues: afterward, in all, 11
8r by day and at night twenty leagues and a half. He told the men 17 leagues. All night they heard birds pass.

Wednesday 10 October

He steered west-southwest; they traveled ten miles per hour and at times 12 and for a time seven and between day and night made 59[2] leagues; he told the men only 44 leagues. Here the men could no longer stand it; they complained of the long voyage. But the Admiral encouraged them as best he could, giving them good hope of the benefits that they would be able to secure. And he added that it was useless to complain since he had come to find the Indies and thus had to continue the voyage until he found them, with the help of Our Lord.

Thursday 11 October[3]

He steered west-southwest. They took much water aboard, more than they had taken in the whole voyage. They saw petrels and a green bulrush near the ship. The men of the caravel *Pinta* saw a cane and a stick, and took on board another small stick that appeared to have been worked with iron, and a piece of cane, and other vegetation originating on land, and a small plank. The men of the caravel *Niña* also saw other signs of land and a small stick loaded with barnacles.[4] With these signs everyone breathed more easily and

1. (7v45) Alvar (1976) reads the canceled text in this line as *de to*.
2. (8r8) The numerals *5* and *9* in the manuscript are both incomplete, the *9* very much so. However, all Spanish editions consulted report the same figure.
3. (8r17) The entry under the date 11 October includes the events of 12 October, when land was first sighted.
4. (8r27) The word *escaramojos* (barnacles) also may designate a wild rose, as Morison (1963) translates, but that meaning seems unlikely in this context.

cheered up. On this day, up to sunset, they made 27 leagues.

After sunset he steered on his former course to the west. They made about 12 miles[1] each hour and, until two hours after midnight,[2] made about 90 miles, which is twenty-two leagues and a half. And because the caravel *Pinta* was a better sailer and went ahead of the Admiral it found land[3] and made the signals that the Admiral had ordered. A sailor named Rodrigo de Triana saw this land first, although the Admiral, at the tenth hour of the night, while he was on the sterncastle, saw a light, although it was something so faint that he did not wish to affirm that it was land. But he called

8v Pero Gutiérrez, the steward of the king's dais, and told him that there seemed to be a light, and for him to look: and thus he did and saw it. He also told Rodrigo Sánchez de Segovia, whom the king and queen were sending as *veedor*[4] of the fleet, who saw nothing because he was not in a place where he could see it. After the Admiral said it, it was seen once or twice; and it was like a small wax candle that rose and lifted up, which to few seemed to be an indication of land. But the Admiral was certain that they were near land, because of which when they recited the

1. (8r32) The word *millas* extends the line into the right margin. It was probably added after the next line was written and the need for the correction from *leguas* to *millas* was noted. Las Casas substitutes *millas* for *leguas* 12 times in the *Diario* (at 3r31, 7r43, 7v34, 8r6, 8r32, 17v42, 32v33, 54v44, 57v25, 59v7, 60r25, and 60r45), but never makes the opposite substitution.

2. (8r33–34) Jane-Vigneras (1960) mistranslates the passage *hasta dos oras despues de media noche* (until two hours after midnight) as "up to two hours before midnight." After sunset the fleet made 90 miles at 12 miles per hour. Elapsed time was seven and a half (90/12) hours. Sunset was at 5:40 P.M. local solar time on 11 October (Julian calendar). Adding 45 minutes for dusk, night began at about 6:30 P.M. Seven and a half hours later the time would have been 2:00 A.M. So the physics and the language are consistent.

3. (8r37) *Hallo tierra.* The importance of this passage is signaled by the figure of a hand drawn in the left margin, with the index finger pointing to line 31, and by Las Casas's marginal note: *hallan ya tierra.* Also see pp. 60–61.

4. (8v4) Morison (1963, 63) translates *veedor* as "comptroller." A note in Jane-Vigneras (1960) indicates that the *veedor* was appointed by the sovereigns to record all gold, gems, and spices found, to ensure against cheating.

Salve, which sailors in their own way are accustomed to recite and sing, all being present, the Admiral entreated and admonished them to keep a good lookout on the forecastle and to watch carefully for land; and that to the man who first told him that he saw land he would later give a silk jacket in addition to the other rewards that the sovereigns had promised, which were ten thousand *maravedís*[1] as an annuity to whoever should see it first. At two hours after midnight the land appeared, from which they were about two leagues distant. They hauled down[2] all the sails and kept only the *treo*, which is the mainsail without bonnets, and jogged on and off,[3] passing time until daylight Friday, when they reached an islet of the Lucayas, which was called Guanahani in the language of the Indians. Soon they saw naked people; and the Admiral went ashore in the armed launch, and Martín Alonso Pinzón and his brother Vicente Anes,[4] who was captain of the *Niña*. The Admiral brought out the royal banner and the captains two flags with the green cross, which the Admiral carried on all the ships as a standard, with an F and a Y, and over each letter a crown, one on one side of the ✠ and the other on the other. Thus put ashore they saw very green trees and many ponds and fruits of various kinds. The Admiral called to the two captains and to the others who had jumped ashore and to Rodrigo Descobedo, the *escrivano*[5] of the whole fleet, and to Rodrigo

1. (8v19) A *maravedí* was a copper coin valued at two *blancas*, or 375 to the gold ducat.

2. (8v22) The Elizabethan English mariners' equivalent to *amaynaron* (hauled down) was *amaine*, which expressed a sense of urgency: "Lower as fast as you can." (Smith 1970, 50).

3. (8v24) *Pusieronse a la Corda* (jogging on and off) means tacking back and forth, intentionally making no headway. See Las Casas's definition at 23v23–25.

4. (8v29) *Anes*. Columbus uses the form "Anes" in every mention of Vicente except one, when the name is spelled "Yanes." Morison spells the name "Yáñez" and "Yáñes."

5. (8v41) Jane-Vigneras (1960) and Morison (1963) translate *escrivano* as "secretary." Jados (1975, 33ff.) translates the Italian equivalent term, *scrivano*, as

Sánchez de Segovia; and he said that they should be witnesses that, in the presence of all, he would take, as in fact he did take, possession of the said island for the king
9r and for the queen his lords, making the declarations that were required, and which at more length are contained in the testimonials made there in writing. Soon many people of the island gathered there. What follows are the very words of the Admiral in his book about his first voyage to, and discovery of, these Indies. I, he says, in order that they would be friendly to us—because I recognized that they were people who would be better freed [from error] and converted to our Holy Faith by love than by force—to some of them I gave red caps, and glass beads which they put on their chests, and many other things of small value, in which they took so much pleasure and became so much our friends that it was a marvel. Later they came swimming to the ships' launches where we were and brought us parrots and cotton thread in balls and javelins and many other things, and they traded them to us for other things which we gave them, such as small glass beads and bells. In sum, they took everything and gave of what they had very willingly. But it seemed to me that they were a people very poor in everything. All of them go around as naked as their mothers bore them; and the women also, although I did not see more than one quite young girl. And all those that I saw

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"ship's clerk." Mallett (1967, 202) translates it as "purser." The *escrivano* seems to have had many responsibilities. His duties (described in articles 55–58 and elsewhere in Jados, 1975) included maintaining and protecting the ship's register (*cartolario*), the records of goods and persons carried, financial transactions, and agreements between those on board ship. If he or anyone else made a false entry in the register, he could lose his right hand, be branded, and have his possessions confiscated. The *escrivano* was also the purchasing agent, materials manager, payroll clerk, and executor of practically every other business management function. But he was also a kind of "officer of the court." His testimony was equal to that of three other witnesses (Jados 1975, article 330). Little wonder that he had to be present to record the landing on Guanahani and the formal claim to the lands discovered!

were young people,[1] for none did I see of more
than 30 years of age. They are very well
formed, with handsome bodies and good faces.
Their hair [is] coarse—almost like the tail
of a horse—and short. They wear their hair
down over their eyebrows except for a little
in the back which they wear long and never
cut. Some of them paint themselves with
black, and they are of the color of the
Canarians, neither black nor white; and some
of them paint themselves with white, and some
of them with red, and some of them with what-
ever they find. And some of them paint their
faces, and some of them the whole body, and
some of them only the eyes, and some of them
only the nose. They do not carry arms nor are
they acquainted with them, because I showed
them swords and they took them by the edge and
9v through ignorance cut themselves. They have
no iron. Their javelins are shafts without
iron and some of them have at the end a fish
tooth and others of other things. All of them
alike are of good-sized stature and carry
themselves well. I saw some who had marks of
wounds on their bodies and I made signs to
them asking what they were; and they showed me
how people from other islands nearby came
there and tried to take them, and how they
defended themselves; and I believed and
believe that they come here from *tierra firme*
to take them captive. They should be good and

1. (9r29–30) *Y todos los . . . todos mancebos.* This statement has been used to support the view that the inhabitants of Guanahani who greeted Columbus on 12 October were all young men except for "one [woman] who was just a girl" (Power 1983, 156). The word *mancebos*, "youths," is masculine, but in Spanish such masculine plural nouns as *hombres*, *jovenes*, and *hijos* can refer to groups made up of individuals of both sexes. Whether there is, in fact, such a reference depends on context (see Keniston 1937, 37). In Columbus's description of the island of San Salvador and its people there are several clear references to women. He writes that the natives "all go as naked as their mothers bore them; and also the women" (9r27–28). Later, going along the coast on the way to the eastern part of the island, he writes that "many men and many women came," each bringing something for the Spaniards to eat or drink (10v22–23). The statement in 9r29 that "I did not see more than one very young girl" may not mean that he saw just one woman: it may mean that he saw only one who was very young. No inferences about the relative numbers of men and women on the island can be drawn from the information provided in the *Diario*.

ado .13. de otubre

intelligent servants, for I see that they say very quickly everything that is said to them; and I believe that they would become Christians very easily, for it seemed to me that they had no religion. Our Lord pleasing, at the time of my departure I will take six of them from here to Your Highnesses in order that they may learn to speak. No animal of any kind did I see on this island except parrots. All are the Admiral's words.

Saturday 13 October

As soon as it dawned, many of these people came to the beach—all young as I have said, and all of good stature—very handsome people, with hair not curly but straight[1] and coarse, like horsehair; and all of them very wide in the forehead and head, more so than any other race that I have seen so far. And their eyes are very handsome and not small; and none of them are black, but of the color of the Canary Islanders. Nor should anything else be expected since this island is on an east-west line with the island of Hierro in the Canaries. All alike have very straight legs and no belly but are very well formed. They came to the ship with dugouts[2] that are made from the trunk of one tree, like a long boat, and all of one piece, and worked marvelously in the fashion of the land, and so big that in some of them 40 and 45 men came. And others smaller, down to some in which came one man alone. They row with a paddle like that of a baker
10r and go marvelously. And if it capsizes on them they then throw themselves in the water, and they right and empty it with calabashes[3]

1. (9v26) *Corredios* is a Portuguese word for "sliding" or "slipping." Applied to hair it probably means "smooth" or "sleek." Jane-Vigneras (1960) mistranslates it as "loose."

2. (9v36) The Portuguese used the term *almadías* for West African dugouts. Columbus did not use the West Indian term *canoa* until 26 October (17v32).

3. (10r3) *Calabazas* (calabashes) are bowls and containers made from the dried, hollow shells of gourds. The word can also apply to the edible or decorative fruit itself.

that they carry. They brought balls of spun cotton and parrots and javelins and other little things that it would be tiresome to write down, and they gave everything for anything that was given to them. I was attentive and labored to find out if there was any gold; and I saw that some of them wore a little piece hung in a hole that they have in their noses. And by signs I was able to understand that, going to the south or rounding the island to the south, there was there a king who had large vessels of it and had very much gold. I strove to get them to go there and later saw that they had no intention of going. I decided to wait until the afternoon of the morrow and then depart for the southwest, for, as many of them showed me, they said there was land to the south and to the southwest and to the northwest and that these people from the northwest came to fight them many times. And so I will go to the southwest to seek gold and precious stones. This island is quite big and very flat and with very green trees and much water and a very large lake in the middle and without any mountains; and all of it so green that it is a pleasure to look at it. And these people are very gentle, and because of their desire to have some of our things, and believing that nothing will be given to them without their giving something, and not having anything, they take what they can and then throw themselves into the water to swim. But everything they have they give for anything given to them, for they traded even for pieces of bowls and broken glass cups, and I even saw 16 balls of cotton given for three Portuguese *çeotis*,[1] which is a Castilian *blanca*.[2] And in

1. (10r33) The *ceutí* was a copper coin commemorating Portugal's capture of Ceuta in 1415.
2. (10r34) A *blanca* was a copper coin valued at half a *maravedí*.

them there was probably more than an *arroba*[1] of spun cotton. This I had forbidden and I did not let anyone take any of it, except that I had ordered it all taken for Your Highnesses if it were in quantity. It grows here on this island, but because of the short time I could not declare this for sure. And also the gold
10v that they wear hung in their noses originates here; but in order not to lose time I want to go to see if I can find the island of Cipango. Now, since night had come, all the Indians went ashore in their dugouts.

Sunday 14 October

go .14 de otubre

As soon as it dawned I ordered the ship's boat and the launches of the caravels made ready and went north-northeast[2] along the island in order to see what there was in the other part, which was the eastern part. And also to see the villages, and I soon saw two or three, as well as people, who all came to the beach calling to us and giving thanks to God. Some of them brought us water; others, other things

1. (10r35) An *arroba* (*arrova*) was a commercial weight of one-quarter of a *quintal* (see p. 107, n. 3), equivalent to 11–12 kilograms (*Diccionario* 1956). Seville also had a second *arroba* unit, equal to one-tenth of a *quintal*, used for buying and selling oil.

2. (10v8) *Camino del nornordeste*. "The way to," or "in the direction of" is expressed in the *Diario* by four phrases that include the word *camino*: *camino de* (16 times); *camino a* (25 times); *camino para* (1 time); and *camino* (4 times). Each phrase is followed by a compass direction or by a place name.

Fuson (1983, 63) maintains that the *de* in *camino de* means "from," not "to," and interprets two critical episodes of the voyage on that basis (*Diario* 10r8–9 and 15v22–23). It is not clear whether he thinks that in all, or only in some, cases *camino de* must be read as "the way from." Power (1983, 153 n. 12) admits that the phrase usually means "the road toward," but it can also (he says) be translated as "the road from." He offers no guidance about when it is to be interpreted in one way and when in the other.

The *Diccionario* (1956) gives two examples of *camino de* meaning "the road to": *Camino de Roma, ni mula coja ni bolsa floja* (On the road to Rome, don't take a lame mule or an empty purse) and *Camino de Santiago, tanto anda el cojo como el sano* (On the road to Santiago [since groups travel together] the lame go as fast as the healthy.) A line by Francisco de Quevedo (1580–1645), from the poem *Todo tras si lo lleva el año breve*, provides another: *Antes que sepa andar el pie, se mueve camino de la muerte* (Before the foot knows how to walk, it moves toward death).

Among the 16 appearances of *camino de* in the *Diario* only one requires translation as "the way from." See p. 123, n. 1. The other occurrences can, and should, be translated as "the way to."

Geography
Central & South America
The Caribbean

Cycle 4, Week 13

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. *Diario* of Christopher Columbus (we'll actually read from it next week)
    - Pages 17 ff.
    - Pages 57 ff.
2. Map handouts and colored pencils:
    - Caribbean Map
    - Blackline Caribbean Map

To Start

1. Recite Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Caribbean Sea
2. Atlanta Ocean
3. Gulf of Mexico
4. The Bahamas
5. Cuba
6. Hispañola (Haiti & the Dominican Republic)
7. Jamaica
8. Puerto Rico
9. There are *thousands* of islands in the Caribbean!

Geography

Lesson (very helpful to use globe to demonstrate)

Christopher Columbus and the myth that Christians believed the world is flat until "science" came along and saved us from our ignorance! (More details at this little article: https://www.history.com/news/christopher-columbus-never-set-out-to-prove-the-earth-was-round)

Since we are a full-throated Christian Worldview co-op, we've got to demolish this false accusation against Christians, so you'll be prepared when you hear it!

The true story is that the Greeks proved, a few hundred years before our Lord Jesus Christ was born, died, and rose again, that the shape of the earth was spherical (or round, like a ball). For anyone who studied the world, it seemed pretty obvious, and many people had long believed this was the case. But at around 250 BC, the Greeks not only proved it but correctly calculated the size of the entire earth, just by using math! (Isn't God wonderful? He created a world of order, and numbers and mathematics, which by their very God-created nature are orderly and perfectly reliable—reflecting the unchanging and always-reliable character of God!!!)

Eratosthenes knew that in Syene (modern Aswan), which lies on the Tropic of Cancer—which means that the Sun is directly overhead at noon on the Summer Solstice. There was a deep well there, in which, only on that one day—the summer solstice—every year, sunlight shone into the bottom of the well at noon. (That never happens for us in Texas, because we live north of the Tropic of Cancer, in the Northern Hemisphere! The Tropic of Cancer is the northernmost point where you can ever have the Sun directly overhead, casting no shadow except directly down; I lived in the tropics when I was growing up, in Hawaii and Cuba, so that was pretty normal for me—in my adult life, it has been very strange for me to realize that I never see the Sun directly overhead anymore!! But many people live their whole lives never having seen the Sun directly overhead!)

Eratosthenes knew that Alexandria, where he lived, was 500 miles north of Syene. So at noon on the summer solstice, he held up a rod, measured the length of its shadow, and figured the angle of the Sun's rays using simple geometry. It was 7.2°. Using the spherical trigonometry, now that he knew the angle difference over 500 miles of the earth's surface, it was simple to calculate the circumference of the earth—around 25,000 miles.

So throughout the entire history of Christendom—for average observers, it was obvious that our world is round, based on the rising and setting of the Sun, ships disappearing bottom-first when they sailed away, etc. For example, on every ship, from Columbus' *Santa* Maria to the *Titanic*, there is a crow's nest, where the lookout is stationed to watch for rocks, icebergs, pirates, or any other danger. Why? Because the world is round, and at sea, where there are no trees, buildings, or mountains in the way, the only thing keeping you from seeing the entire sea is the curvature of the earth! And the higher up you are above the earth, the more of the earth you can see before it curves away out of view. Christians (and even pagan peoples who bothered to study God's creation) understood that the world was shaped like a globe, even though they had not yet created rocketships to go up into space and take pictures of it yet.

Then why do TV and movies and everyone say that Europeans (by which they mean Christians) believed the earth was flat until Christopher Columbus?

There was a famous American author in the early 1800s named Washington Irving. (He was *named after* George Washington—no relation!) He wrote a "history" of Christopher Columbus, where he added imaginary details to make the story more interesting, including imagining a tale that the supstitious Roman Catholics around Columbus thought the earth was flat and that if you sailed too far, you'd sail off the end of the earth. That's it! Irving was already a very successful author; the book became very popular; and by the time the next generation grew up, they all believed it had actually happened that way.

Irving himself was certainly not a Christian. Although he attended an Episcopalian church (most everyone in America attended church in those days), the legacy he leaves behind bears no marks of faithfulness to Christ. Indeed this tale he made up has been used for 200 years by atheists and God-haters to accuse Christians of being backward people who are so ignorant as to believe the earth is flat, despite how obvious it is that it is round.

For example, just watch any sunset from a high point, and see how the sunlight changes, both in the East and the West, not as it would if it had dipped below a flat disk, suddenly getting dark all over the earth's surface; but in the East, the shadow of the earth rises as a dark shadow in the sky, and grows higher and higher as the Sun sinks; and in the West, the light does not suddenly go out when the Sun dips below the horizon like it would if the earth were flat, but instead the sky stays light and then grows dimmer and dimmer, as the light of the Sun goes further and further round the sphere of the earth, til the light of the Sun is blocked completely by the earth.

Drill Again

CARIBBEAN SEA • MAR CARIBE


75° W
70° W
65° W
60° W
25° N
20° N
15° N
10° N
Gulf of Mexico
Atlantic Ocean
Caribbean Sea
0
500 Miles
0
500 KM

Geography
South America
Physical

Cycle 4, Week 14

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. *Exploring the World Through Cartography*
2. Map to display:
    - Patagonian Desert
3. *Diario* of Christopher Columbus
    - Pages 17 ff.
4. Map handouts and colored pencils:
    - South America Relief Map—no coloring on this one! Only to look at.
    - South America Physical Blackline Map—trace or color, if they want to, during the lesson.

To Start

1. Recite Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Andes Mountains
2. Amazon River
3. Amazon Rainforest
4. Mato Grosso Plateau
5. Patagonia
6. Patagonian Desert—freezing cold!
7. Strait of Magellan
8. Tierra del Fuego—glaciers!
9. Cape Horn
10. Drake's Passage
11. Galapagos Islands
12. Falkland Islands

Geography

South America: Physical (introduce the map & go over this quickly!)

Turn to *Cartography* p. 46. Questions to ask/Things to Learn:

- Why is Central America usually grouped with South America, even though it's more naturally part of North America? (Culturally it's connected to South America.)
- Look at the colors (browns & greens); how are they different in this photograph than the Physical map I handed out? (The handout is a relief map! Review what the colors in a relief map mean; for example: green doesn't mean forest; it means close to sea level!)
- What do you notice about the colors? What are you seeing in these colors? (tan = desert/arid; green = trees; blue = water; white = ice/snow.)
- How are the shapes different from the handout map?

Lesson (finish up from last week! Quickly!!)

Then why do TV and movies and everyone say that Europeans (by which they mean Christians) believed the earth was flat until Christopher Columbus?

There was a famous American author in the early 1800s named Washington Irving. (He was *named after* George Washington—no relation!) He wrote a "history" of Christopher Columbus, where he added imaginary details to make the story more interesting, including imagining a tale that the supstitious Roman Catholics around Columbus thought the earth was flat and that if you sailed too far, you'd sail off the end of the earth. That's it! Irving was already a very successful author; the book became very popular; and by the time the next generation grew up, they all believed it had actually happened that way.

Irving himself was certainly not a Christian. Although he attended an Episcopalian church (most everyone in America attended church in those days), the legacy he leaves behind bears no marks of faithfulness to Christ. Indeed this tale he made up has been used for 200 years by atheists and God-haters to accuse Christians of being backward people who are so ignorant as to believe the earth is flat, despite how obvious it is that it is round.

For example, just watch any sunset from a high point, and see how the sunlight changes, both in the East and the West, not as it would if it had dipped below a flat disk, suddenly getting dark all over the earth's surface; but in the East, the shadow of the earth rises as a dark shadow in the sky, and grows higher and higher as the Sun sinks; and in the West, the light does not suddenly go out when the Sun dips below the horizon like it would if the earth were flat, but instead the sky stays light and then grows dimmer and dimmer, as the light of the Sun goes further and further round the sphere of the earth, til the light of the Sun is blocked completely by the earth.

Geography

Learn More (the real lesson for today!!!)

- Today, we're going to read a bit from Columbus' *Diary* of his journey. We don't have time for much, but a few excerpts will give you an idea about his character and what it was like. (If we run out of time, we'll read it next week!)
- Prologue for King Ferdinand and Queen Isabella (pages 17, 19, 21).
- (You must learn their names.)
- (You must also learn the names of Columbus's ships—the *Niña*, the *Pinta*, and the *Santa Maria*.)
- (Finally, you must learn, "In fourteen hundred ninety-two, Columbus sailed the ocean blue." The rest of the poem is attached!)
- *The Ocean Sea.* The seas were bodies of water surrounded by lands, or broken up by lands or islands. The ocean was the great sea that surrounded everything else.
- As they sailed across the Atlantic, Columbus took daily measurements of the distance they'd traveled, but he lied to the sailors on board day after day, so they would not be so fearful about traveling so far from Spain, possibly going too far to be able to return!
- And we'll read more next week!

Drill Again

Geography

IN 1492

In fourteen hundred ninety-two
Columbus sailed the ocean blue.

He had three ships and left from Spain;
He sailed through sunshine, wind and rain.

He sailed by night; he sailed by day;
He used the stars to find his way.

A compass also helped him know
How to find the way to go.

Ninety sailors were on board;
Some men worked while others snored.

Then the workers went to sleep;
And others watched the ocean deep.

Day after day they looked for land;
They dreamed of trees and rocks and sand.

October 12 their dream came true,
You never saw a happier crew!

"Indians! Indians!" Columbus cried;
His heart was filled with joyful pride.

But "India" the land was not;
It was the Bahamas, and it was hot.

The Arakawa natives were very nice;
They gave the sailors food and spice.

Columbus sailed on to find some gold
To bring back home, as he'd been told.

He made the trip again and again,
Trading gold to bring to Spain.

The first American? No, not quite.
But Columbus was brave, and he was bright.


Yucatan Peninsula
Gulf of California
Caribbean Sea
Sierra Madres
Panama Canal
Llanos
Amazon River
Amazon Basin
Andes Mountains
Latin America Physical Landforms
Sao Fransisco River
Parana River
Pampas
Patagonia
Strait of Magellan
Cape Horn


SOUTH AMERICA
0 km 350 700 1050 km
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UNITED STATES
Miami
Key West
West Palm Beach
Abaco I.
NASSAU
BAHAMAS
Andros
Gulf of Mexico
HAVANA
Matanzas
Pinar del Río
CUBA
Camagüey
Bayamo
Santiago de Cuba
Turks and Caicos (UK)
Mérida
Cancún
Yucatán
Campeche
Villahermosa
Cayman Is. (UK)
DOMINICAN REP.
Puerto Rico (USA)
Virgin Islands (UK)
HAITI
PORT-AU-PRINCE
STO DOMINGO
Virgin Islands (USA)
JAMAICA
KINGSTON
BELIZE
BELMOPAN
MEXICO
GUATEMALA
GUATEMALA
HONDURAS
TEGUCIGALPA
SAN SALVADOR
EL SALVADOR
NICARAGUA
MANAGUA
Lake Nicaragua
SAN JOSE
COSTA RICA
Panama Canal
PANAMA
Colón
PANAMA
ANTIGUA AND BARBUDA
Guadeloupe (Fra)
ST. KITTS AND NEVIS
DOMINICA
Martinique (Fra)
ST. LUCIA
BARBADOS
ST. VINCENT AND THE GRENADINES
GRENADA
Greater Antilles
Lesser Antilles
CARIBBEAN SEA
Netherlands Antilles
TROPIC OF CANCER
NORTH
ATLANTIC
OCEAN
Cristóbal Cólon Peak
5775
Barranquilla
Cartagena
Maracaibo
CARACAS
PORT OF SPAIN
TRINIDAD AND TOBAGO
Barquisimeto
Mérida
Ciudad Bolívar
Ciudad Guayana
GEORGETOWN
PARAMARIBO
Cayenne
VENEZUELA
La Gran Sabana
SURINAME
GUYANA
FRENCH GUIANA
Medellín
Manizales
BOGOTA
Cali
COLOMBIA
Llanos
Orinoco
Magdalena
Neiva
Popayán
Pasto
Boa Vista
Guaviare
Mitú
Puerto Inírida
Rio Branco
Rio Negro
Caquetá
Japurá
Putumayo
Coco Island (Costa Rica)
Malpelo Island (Costa Rica)
Esmeraldas
ECUADOR
QUITO
EQUATOR
EQUATOR
Isabela I.
San Cristóbal I.
Galapagos Islands (Ecuador)
Portoviejo
Guayaquil
6310
Chimborazo
Cuenca
Macapá
Belém
São Luís
Amazon
Amazon
Santarém
Manaus
Iquitos
Leticia
Selvas
Basin
Sullana
Piura
Chiclayo
Trujillo
Chimbote
6746
Nev. Huascarán
Ucayali
Juruá
Purus
Pucallpa
Rio Branco
Porto Velho
BRAZIL
Caatingas
Xingu
Tapajós
Imperatriz
Teresina
Fortaleza
Natal
João Pessoa
Recife
Maceió
Aracaju
Salvador
Mossoró
Juàzeiro
Sobradinho Reservoir
Palmas
Tocantins
Araguaia
Mato Grosso
LIMA
Cuzco
PERU
Andes
6421
Nev. Illampu
Lake Titicaca
LA PAZ
BOLIVIA
Cochabamba
Santa Cruz
Arequipa
Lake Poopó
Altiplano
Arica
SUCRE
Potosí
Salar de Uyuni
Iquique
Tarija
Corumbá
Cuiabá
Rondonópolis
Serra Geral de Goiás
São Francisco
Espinhaço
BRASILIA
Anápolis
Goiânia
Itabuna
Vitória da Conquista
Governador Valadares
Belo Horizonte
Vitória
Campo Grande
Paraná
Serra do Mar
Nova Iguaçu
Rio de Janeiro
2787
São Carlos
Campinas
São Paulo
Santos
São Paulo (Brazil)
Fernando de Noronha (Brazil)
Martin Vaz Islands (Brazil)
TROPIC OF CAPRICORN
Salar de Atacama
Antofagasta
Calama
PARAGUAY
Pedro Juan Caballero
Concepción
Gran Chaco
Bermejo
Pilcomayo
ASUNCION
Ciudad del Este
Campos
Curitiba
Florianópolis
Salta
San Felix I.
San Ambrosio I. (Chile)
6862
Nev. Ojos del Salado
San Miguel de Tucumán
Santiago del Estero
Resistencia
Corrientes
Posadas
Uruguay
Caxias do Sul
Porto Alegre
SOUTH
La Serena
Salinas Grandes
Paraná
Santa Fé
Santa Maria
Juan Fernández Islands (Chile)
6959
Aconcagua
Córdoba
Rosario
Paraná
Salto
URUGUAY
Rio Grande
Mercedes
Valparaíso
Mendoza
SANTIAGO
Rancagua
Río Cuarto
Salado
BUENOS AIRES
MONTEVIDEO
La Plata
Talca
Pampas
PACIFIC
SOUTH
Concepción
Colorado
ARGENTINA
Mar del Plata
Temuco
Neuquén
Bahía Blanca
Negro
CHILE
Patagonia
San Carlos de Bariloche
Viedma
Puerto Montt
Chiloé Island
Chubut
Rawson
OCEAN
ATLANTIC
Los Chonos Archipelago
Lake Colhué Huapi
Chico
Comodoro Rivadavia
Lake Gen. Carrera
Lake Buenos Aires
Falkland Islands (UK)
West Falkland
Stanley
East Falkland
OCEAN
Río Gallegos
Puerto Natales
Punta Arenas
Isla Grande de Tierra del Fuego
Santa Inés Island
Ushuaia
Wollaston I.
Diego Ramírez Is.
Cape Horn
Shag Rocks (UK)
2934
South Georgia (UK)
South Sandwich Islands (UK)
90° West
75° West
60° West
Longitude West 45° of Greenwich
30° West

Geography

South America
Major Cities

Cycle 4, Week 15

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. *Exploring the World Through Cartography*
2. *Diario* of Christopher Columbus
    - Pages 57 ff.
3. Map handouts and colored pencils:
    - South America Cities & Political Map—no coloring on this one! Only to look at.
    - South America Cities & Political Blackline Map—trace or color, if they want to, during the lesson.

To Start

1. Recite Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Rio de Janeiro
2. Sao Paulo
3. Buenos Aires
4. La Paz
5. Santiago
6. Lima
7. Quito
8. Bogota
9. Caracas
10. Brasilia

Geography

South America Cities

Turn to *Cartography* p. 50–51. Questions to ask/Things to Learn:

- Why are the cities located where they are? (Note waterway transportation routes, good fishing, agriculture cultivation, etc. But mostly, the inland of South America has largely not been put under the dominion of man, and is wild and dangerous, so most of the cities of South America are along the coasts.)
- Most of the major cities of Central and South America have Spanish names; why? (They were named by the Spanish conquistadores in the 16th and 17th centuries.)
- Did the Spanish build those cities? (They had a big impact. Typically, the Spanish continued to build onto cities that were thriving under the rule of the Mayans, Incas, Aztecs, etc., but the Spanish brought the European architecture; it's very clear which buildings come from the Spanish times.)
- Were the Spanish conquistadores a blessing or a curse to the Native American tribes/civilizations? (Bit of a mixed bag. The Native Americans committed horrific atrocities as part of daily life; they would slaughter even *thousands* of people at their temples in a single day, to serve their pagan gods, cutting their arms and legs off, cutting their heads off, cutting their hearts out, etc. But the Spanish served the heretical Roman Catholic church, which also tortured and enslaved innocent people under the Spanish Inquisition. While they ended up living in greater peace (the human sacrifices were stopped, for example!) and saw many improvements, very few heard the true Gospel, and most came to believe a false Gospel which had no power to save them from eternal destruction.)

Learn More

- Review Columbus's *Diary* from last week, carry on!
- *The Ocean Sea.* The seas were bodies of water surrounded by lands, or broken up by lands or islands. The ocean was the great sea that surrounded everything else.
- As they sailed across the Atlantic, Columbus took daily measurements of the distance they'd traveled, but he lied to the sailors on board day after day, so they would not be so fearful about traveling so far from Spain, possibly going too far to be able to return!
- After two months on the Ocean Sea… (page 57 ff.)

Drill Again

1. Rio de Janeiro
2. Sao Paulo
3. Buenos Aires
4. La Paz
5. Santiago
6. Lima
7. Quito
8. Bogota
9. Caracas
10. Brasilia

Latin America

801490 (544170) 3-90

Latin America

Geography
South America
Political

Cycle 4, Week 16

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. *Diario* of Christopher Columbus
    - Pages 57 ff.

2. Map handouts and colored pencils (same from last week):

    - Central & South America Cities & Political Map—no coloring on this one! Only to look at.
    - Central & South America Cities & Political Blackline Map—trace or color, if they want to, during the lesson.

To Start

1. Recite Key Verse.
2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)
3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Drill

1. Colombia
2. Venezuela
3. Brazil
4. Ecuador
5. Peru
6. Bolivia
7. Chile
8. Argentina
9. Paraguay
10. Uruguay

Geography

Learning

- Note natural boundaries that form national boundaries, particularly the Andes.
- Note, also, the most of the Amazon Rainforest is in Brazil.

Learn More

- Read more from Columbus's *Diario*.
- (Robyn: See notes you didn't get to from previous weeks. ☺)

Drill Again

Flood Model Solves Antarctica Rainforest Mystery

TIM CLAREY, PH.D.

article highlights

- Scientists discovered evidence of an ancient rainforest in Antarctica.
- The forest is too far south to have thrived if secular geology models are correct.
- This Antarctic rainforest provides additional evidence for the Genesis Flood and ICR's Flood model.

A recent study published in *Nature* has evolutionary scientists baffled. The researchers reportedly found an ancient rainforest in Antarctica, of all places. The study's authors claim this part of Antarctica was very close to the South Pole at the time the forest thrived, at about 82° south latitude.[1]

How could a temperate rainforest exist this close to the South Pole and survive four-plus months of total darkness each year? A biblical perspective solves this mystery.

Johann Klages of the Alfred Wegener Institute and a consortium of European scientists used a drill ship to take a sediment core off West Antarctica's Amundsen Sea between February and March 2017.[2] The sediments were claimed to be between 84 and 94 million years old, placing them within the Cretaceous system.[1] Ashley Strickland of CNN reported:

> CT scans of the sediment core revealed pristine samples of forest soil, pollen, spores and even root systems so well preserved that [the researchers] could identify cell structures. The soil included examples of pollen from the first flowering plants found this close to the South Pole.[2]

Tina van de Flierdt and Johann Klages work on the sample of ancient fossil soil

Based on these plant fossil types, the scientists determined the area had an average daytime temperature of 53°F, roughly two degrees higher than present-day Germany.[1,2] This is much warmer than today's Antarctic temperatures, which fluctuate between -76 and 14°F.[2] Study co-author and Imperial College London professor Tina van de Flierdt told CNN:

> The preservation of this 90-million-year-old forest is exceptional, but even more surprising is the world it reveals….Even during months of darkness, swampy temperate rainforests were able to grow close to the South Pole, revealing an even warmer climate than we expected.[2]

Could forests like this really grow so far south and survive through months of total darkness? It's highly doubtful, and none of these plant types grow today in polar climates with that little sunlight. What's going on here?

Secular scientists have created different plate tectonic configurations that they believe existed throughout the deep time required by their evolutionary worldview. During the Cretaceous, they place this part of Antarctica close to the South Pole. The plants reported in the study would thus have grown in this extreme southerly position. But in a global Flood model, these plants grew only about 4,400 years ago on land that was much farther north.

Most creation geologists believe the tectonic plates moved rapidly during the Flood year.[3] The Flood model we've developed at ICR holds that Antarctica was part of a Pangaea-like supercontinent when these fossils plants were growing.[4] They were buried late in the Flood as the waters were nearing their zenith. In fact, our pre-Flood continental configuration has the Antarctic plant fossils growing near 45° south latitude, about the equivalent to southern New Zealand.[4] Not surprisingly, these types of trees and flowering plants are exactly the types we find in that area today. As Ashley Strickland reported, "The forests were similar to those now found on New Zealand's South Island, the researchers said."[2]

The baffling discovery of a lush rainforest near the South Pole isn't a mystery if the book of Genesis is viewed as an accurate historical record. These trees and plants grew in a temperate climate far from the South Pole and were buried, fossilized, and rapidly moved to their present position during the Flood year just 4,400 years ago. These fossils bear strong testimony to the accuracy of the Genesis narrative.

References

1. Klages, J. P. et al. 2020. Temperate rainforests near the South Pole during peak Cretaceous warmth. *Nature.* 580: 81-86.
2. Strickland, A. Evidence of ancient rainforests found in Antarctica. *CNN.* Posted on cnn.com April 1, 2020, accessed April 2, 2020.
3. Clarey, T. 2016. Embracing Catastrophic Plate Tectonics. *Acts & Facts.* 45 (5): 8-11.
4. Clarey, T. 2020. *Carved in Stone: Geological Evidence of the Worldwide Flood.* Dallas, TX: Institute for Creation Research, 153-179.

Dr. Clarey is Research Associate at the Institute for Creation Research and earned his Ph.D. in geology from Western Michigan University.

Life at the South Pole

Marker for the geographic South Pole

2:34 p.m., June 15, 2007–*James Roth, a senior electronics and instrumentation technician in UD's Department of Physics and Astronomy, recently completed his fourth season in Antarctica, working on UD's "IceTop" project. His blog from the South Pole on Jan. 15 provides insight into what it's like to live and work on the harshest continent on the planet.*

What's it like living at the South Pole? I'll try to sum it up. South Pole Station is located at the geographical South Pole. It is on top of a two-mile-deep glacier. It is the coldest, highest and driest desert on Earth.

There has been a lot of change at the pole over the last several years. The new, elevated station has been under construction to replace the Dome, which is slowly being buried by annual snowfall. The Dome had been the home for South Pole residents for over 30 years, but it is being dismantled as operations are shifted to the new station. The new, elevated station houses summer residents as well as the winter-over crew that will stay all year, through the six months of darkness.

There are now two places that house summer residents at the pole. Summer camp has several cloth-covered huts called "jamesways." Most are living quarters, but there is also a lounge where you can hang out and maybe watch a movie. The jamesways are heated, but the floors are still pretty cold. They are dark inside, so sleeping in the 24-hour sunlight is no problem. The bathrooms and showers are located in a separate building at the center of summer camp. That means that you have to come out from your warm, dark room into the bright, cold to go to the bathroom. I stayed in the jamesways two years ago.

The station and summer camp are just about bursting at the seams with the current population of 266 people. I think that is close to a record. The station was not designed to handle so many people. There are two major experiments under construction in addition to the station construction itself and many other smaller experiments.


The Dome housing scientists and staff

All of these people have to fit their whole year's worth of work into the three-month summer window. For that reason, people work very hard. Most people work nine to 12 hours a day, six days a week. I have worked every day since I arrived Dec. 15 (some days just a few hours) to complete my tasks in the 32-day window that I had scheduled here. After the last aircraft leaves in early February, the station is not accessible until the next November. Only the winter crew of about 60 people is left here to watch the one and only sunset a year.

The new station has all the comforts of home. It has the galley and kitchen, bathrooms and showers, a laundry room, TV lounges, a recreation room with a pool table and a ping-pong table, a gym and a greenhouse. There is even a recreation room where you can play an instrument. There is enough equipment for a complete band. There are, of course, administrative offices and conference rooms, too.

One of the best things about the pole is the food! In fact, your day revolves around the galley schedule. In 24 hours of daylight, the only way to know it's morning is because the galley is serving eggs! I'm told your body burns up to 40 percent more calories trying to keep warm while working outside at the pole.

They feed you very well here. There are three meals a day, plus midnight rations ("midrats") for the night shift. Despite the good food, most people lose weight here. Well, most people except me! I've got to stay away from the cookies and ice cream!

Extreme cold weather clothing is essential

Generators supply power, heat and water to the station. They run on JP-8 jet fuel brought in by the C-130 aircraft that supply the station. Without the generators, we couldn't survive at the pole. You know how expensive gas is at home. Imagine how expensive jet fuel is and add to it the cost of flying it to the South Pole! It takes 336 C-130 flights during the summer to support the station and the science through the winter. Power and water conservation is always in progress. We are only allowed two showers a week for two minutes. Shower days, I feel like a new person!

While the new station makes you feel at home, we are still on the harshest continent on Earth. When most people think of the South Pole, they think about the cold. How cold is it? The average summer temperature is 35 degrees Celsius below zero. Right now, at mid-summer, the typical day is -15 to -20 degrees C. The wind chill makes it feel a lot colder.

Most summer days that I've been here, the winds have been mild. The last two days, however, we've had a storm with wind sustained at 24 knots. That drives the wind chill down into the -40s or colder. This morning, I walked about three-quarters of a mile to one of my work sites. It was nearly a complete white-out. If not for the flags along the route, I could have easily gotten lost.

We are well-prepared for the cold. Our ECWs (Extreme Cold Weather clothing) are issued in Christchurch, New Zealand, by Raytheon Polar Services' clothing distribution center. Even in the extreme cold, I can usually work outside for several hours at a time. Again, eating a good meal helps keep you warm. If you are working outside, especially in the wind, you have to keep all skin covered or you will get frostbite!

The cold is easy to handle by dressing properly. There are other issues to deal with at the pole that most people don't think of. We are at a pressure altitude of 10,000 to 11,000 feet. Up here, the air is very thin. It takes days to weeks to get used to breathing such little oxygen. This year alone, six people had to be evacuated in 10 days for Acute Mountain Sickness (AMS). Your body does finally adjust. After a month at the pole, I'm getting around pretty good, but climbing steps still sucks the wind out of me!

The other issue here is humidity, or the lack thereof! It is for the most part 0 percent humidity. It is very important to stay hydrated. You are issued a water bottle in Christchurch. It is with you always! It's even within reach when you sleep. Chapstick and moisturizing lotion are also essentials.

James Roth, a senior electronics and instrumentation technician at UD, recently completed his fourth season in Antarctica, working on UD's "IceTop" project. Photo by Jeff Cherwanka

The people make the South Pole worth coming to. Everybody is friendly and cooperative. You meet people from all over the world. You can be from different cultures, but here, you are all Polies!

Text and photos by James Roth

Geography
The Poles
Antarctica

Cycle 4, Week 17

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Previous maps.

   - Piri Re'is Map—no coloring on this one! Only to look at.
   - Oronteus Finaeus Map—no coloring on this one! Only to look at.

3. Pass out map handouts and colored pencils.

   - Antarctica Map—no coloring on this one! Only to look at.
   - Antarctica & Southern Islands Map—no coloring on this one! Only to look at.
   - Antarctica Blackline Map—trace or color, if they want to, during the lesson.
   - "Flood Model Solves Antarctica Rainforest Mystery" article (*Acts &* Facts, June 2020; pass out one to each family).
   - Life at the South Pole (read at the end, article for tutor, not to pass out).

To Start

1. Explain Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Geography

Drill

1. Transantarctic Mountains
2. South Pole
3. Ross Ice Shelf
4. Antarctic Penninsula
5. Weddell Sea
6. Queen Maud Land
7. Southern Ocean
8. Drake's Passage

Southern Islands:

1. South Shetland Islands
2. South Sandwich Islands
3. Falkland Islands
4. Auckland Island
5. South Georgia Island
6. Macquarie Island

Antarctica: There's a lot to cover, so listen fast!!

Turn to *Cartography* p. 170–171.

- The South Pole has daytime with no night for 6 months, and nighttime with no day for 6 months! One sunrise and one sunset a year!!!
- The North Pole, the Arctic, is the same way, but there is no land up there. There is a giant ice sheet up there, called the polar ice cap, and it hasn't gotten warm enough up there for it to melt, since the Ice Age.
- Piri Re'is & Oronteus Finaeus Maps: Remember these from earlier in the year? (Hopefully, they can turn to these maps in their notebooks!) These are two maps we have from the Renaissance period, and the mapmakers explained that they had derived their knowledge of parts of the world that were unknown at their time (like North America, South America, and Antarctica) from ancient maps handed down by mapmakers for centuries, perhaps even from the Library of Alexandria. Not only is it amazing that Antarctica and the Americas are accurately mapped out, but the coastline of Antarctica shows the accurate coastline *without ice*. This is something we have only very recently been able to figure out, using satellites, radar, and other advanced technology! Notice that each continent, including Antartica, accurately shows pictures of some of the animals that lived there. Non-Christian scientists with their Darwinist mythology have no explanation for this.
- Pass out "Flood Model Solves Antarctica Rainforest Mystery", for families to enjoy at home. ☺
- According to the Creationary scientific model called Catastrophic Plate Tectonics, we believe that the year-long Flood of Noah included the tectonic plates of the continents rapidly sliding across the world, and coming to a grinding halt (causing the great mountain chains of the Rockies, Andes, Great Dividing Range, Himalayas, Alps, etc. as the great masses of earth came to a crashing stop). If true, there would have been an unimaginable amount of volcanic activity worldwide, which would have caused an Ice Age, lasting maybe 500 years, after the Flood.

Geography

- After the Flood, the oceans would have been very pleasant for swimming in, because of all the volcanic activity on the ocean floor warming them up! That was when all the Pacific Islands formed, Yellowstone erupted, etc. There would have been no ice on the Arctic Ocean, but you could have sailed right across it. Places up north like Canada and Siberia and down south like Antarctica would have been lovely places to live, and many animals and lush vegetation thrived there—in Antarctica, we have found remains of dinosaurs, rodents, opposums, horse-type and elephant-type animals, marsupials, and entire forests, which, again, is a mystery to evolutionary scientists.
- During this time, also because of all the volcanic activity, the sky would have been dark with ash clouds, all around the world. The warm oceans would have caused lots of rain and snow, and the dark skies would have kept the areas far from the sea quite cold, so that they soon became covered with snow and ice, which didn't melt in the summer, and kept growing, year after year!
- After a few hundred years, we think, the oceans began to cool off enough that the land close to the oceans stopped being warn, and they started getting covered by snow and ice, too. Finally, the volcanic activity got to be mostly settled down, like it is today, the skies cleared, and continents warmed up, so much of the snow and ice melted. But some areas, such as the North Pole, some mountaintops, and Antartica, have still not melted off all of their ice from the Ice Age, 4,000 years ago!
- The polar ice cap at the North Pole, the mountains of ice on Antarctica, and even many glaciers at the tops of high mountains today *could not form* under the weather conditions we see today. We believe that these giant sheets of ice, in their bulk, formed during the Ice Age, and still have not melted in the 4,000 years since then!
- We have abundant evidence like these maps, indicating that, after the Flood and the Tower of Babel, the grandchildren of Noah (a shipbuilder, you will recall) sailed around the entire world, visiting different peoples and mapping out the continents. That's our Timeline peg—Global Interaction of Civilizations!
- Back to *Cartography* p. 170–171: In Antarctica today, ice sheets grow in winter, retreat in summer.
- Today, no animals live in Antarctica year-round, but several varieties of penguins spend their winters there each year. But that's it!!
- About sixty people live at the American station at the very South Pole, year-round, and many more come down to do scientific research each summer—November through February. There are certain spots where bare rock is visible, without ice, in Antarctica, but it's mostly covered with snow—even 2 miles deep!!
- The stories of Earnest Shackelton and Roald Amundson's courageous expeditions to find the South Pole are *fascinating!*

Life At The South Pole (Read article; it's not long! But still, read fast. ☺)

Drill Again


AUSTRALIA
150°E
180°
150°W
Chatham Is
Bounty Is
The Snares
Auckland Is
Antipodes Is
Campbell I
Macquarie I
40°S
120°E
120°W
60°S
80°S
ANTARCTICA
90°E
90°W
Heard I and
McDonald Is
Kerguelen Is
ARGENTINA
Falkland Is
Crozet Is
South Georgia
60°E
Marion I and
Prince Edward I
South Sandwich Is
60°W
Bouvet I
Gough I
30°E
0°
30°W


ANTARCTICA
West of Greenwich 0° East of Greenwich
SOUTHERN OCEAN
King Haakon VII Sea
Antarctic Circle
Orcadas (Argentina)
South Orkney Islands (UK)
Novolazarevskaya (Russia)
Neumayer (Germany)
Sanave (South Africa)
Maitri (India)
Syowa (Japan)
Molodezhnaya (Russia)
Queen Maud Land
Enderby Land
Kemp Land
Mawson (Australia)
Mac Robertson Land
Amery Ice Shelf
Zhongshan (China)
Progress (Russia)
Davis (Australia)
Princess Elizabeth Land
Kaiser Wilhelm II Land
Mirny (Russia)
Queen Mary Land
Wilkes Land
Casey (Australia)
Adélie Land
Dumont d'Urville (France)
Victoria Land
Ross Sea
McMurdo (US)
Scott Base (NZ)
Roosevelt
Mountains
Ross Ice Shelf
Mt. Kirkpatrick 4528 m
Mt. Markham 4351 m
Marie Byrd Land
Transantarctic
Getz Ice Shelf
Amundsen Sea
Bellingshausen Sea
Ellsworth Land
Mt. Tyree 4852 m
Vinson Massif 4897 m
Peter I
Thurston
Antarctic Circle
WEST ANTARCTICA
Ronne Ice Shelf
Berkner
Korff Ice Rise
Henry Ice Rise
Alexander
Antarctic Peninsula
Palmer Land
Bransfield Strait
South Shetland Islands (UK)
Palmer (US)
Larsen Ice Shelf
Adelaide
Rothera (UK)
Belgrano II (Argentina)
Halley (UK)
Coats Land
Weddell Sea
Prime Meridian
Valkyrie Dome 3807 m
Dome Argus 4030 m
Polar Plateau
Hercules Dome
South Pole
Amundsen-Scott (US)
Geomagnetic South Pole
Vostok (Russia)
EAST ANTARCTICA
INDIAN OCEAN
International Date Line
West of Greenwich
East of Greenwich
0 500 1000 Km
0 500 Miles
LEGEND
Mountain Peak
Research Station
Copyright © 2013 www.mapsofworld.com
(Created on 22nd January, 2013)


30°0'0" W
30°0'0" E
Marion Island
South
Sandwich Island
South
Georgia
Possession Island
60°0'0" E
Kerguelen Island
Heard Island
Antarctic
Peninsula
Antarctic Convergence
Maquarie Island
150°0'0" W
150°0'0" E
1200
2400
3600
km

Geography
The Poles
The Arctic

Cycle 4, Week 18

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Supplies:

    - Globe
    - Mag Lite

2. Pass out map handouts (no coloring this week).

    - Arctic Maps 1–3 (2 pages)—no coloring! Only to look at.
    - Arctic 1907 historical Map—no coloring on this one! Only to look at.

To Start

1. Explain Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com) Cartographers are mapmakers.

Geography

Lesson

We'll all come together into Robyn's classroom so Robyn can do the demonstration showing how the Sun rises and sets.

- How the Sun rises and sets where we live, at different times of year.
- How the Sun rises, sets, and goes around the sky in the Arctic.
- Same for Antarctic.

(*Then* we'll split into our different classes for looking at maps and learning locations.)

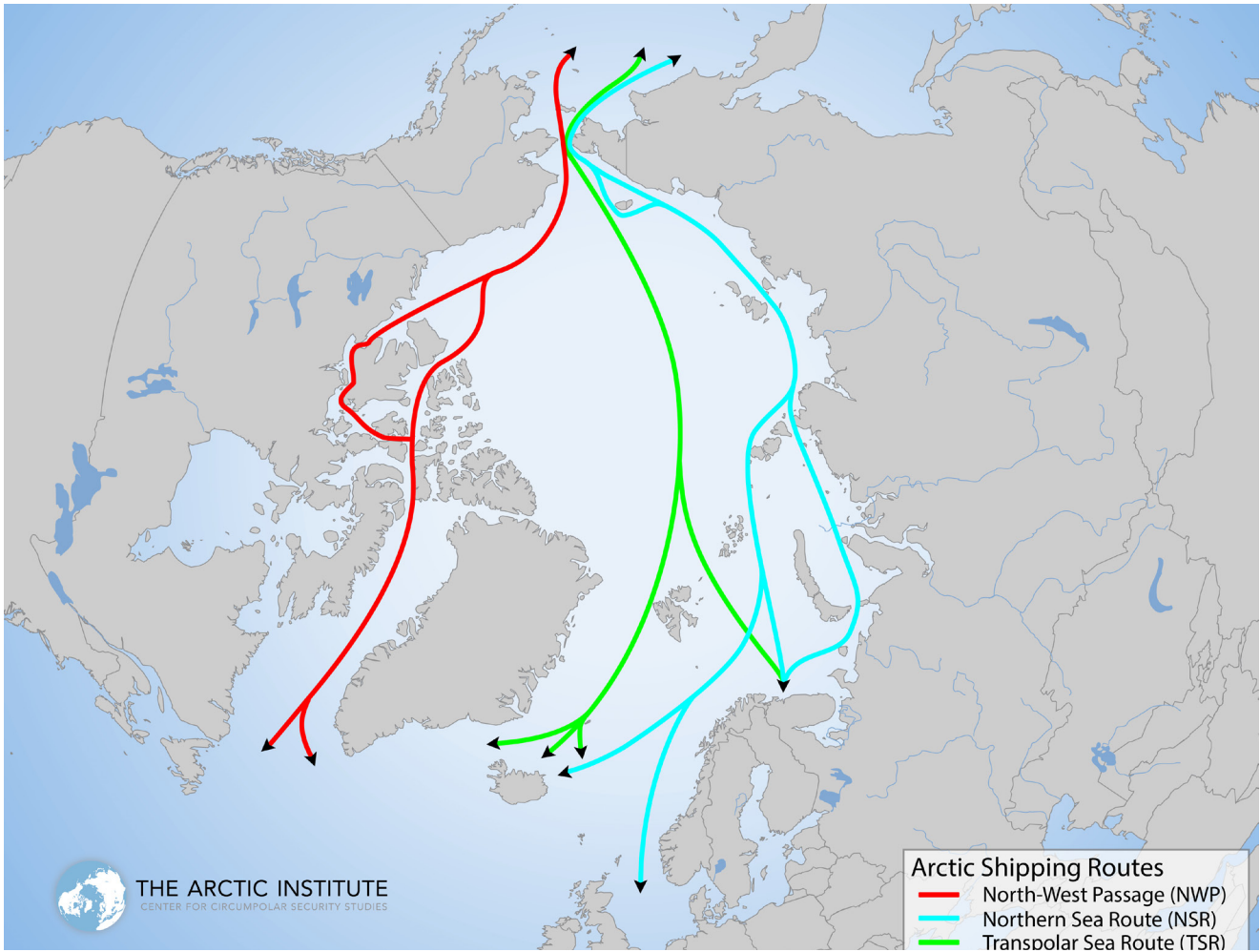
Drill

1. North Pole
2. Arctic Ocean
3. Barents Sea
4. Laptev Sea
5. Greenland Sea
6. Baffin Bay
7. East Siberian Sea
8. Beaufort Sea
9. Chukchi Sea
10. Bering Sea
11. Bering Strait

Arctic Permafrost Zones

Arctic Ocean with labels

Arctic Shipping Routes



1907 North Pole Regions Map
National Geographic

GEOGRAPHY

NORTH AMERICA PHYSICAL: WATERS

Cycle 4, Week 25

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

   - North America Relief map (*Cartography* book)
   - North America Physical blackline map

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

Drill

1. Mississippi River
2. Great Lakes
3. Gulf of Mexico
4. Hudson Bay
5. Rio Grande River
6. Red River
7. Colorado River
8. Snake River
9. Arkansas River
10. Missouri River
11. St. Lawrence River

North America Physical

Turn to *Cartography* pp. 20-21. Questions to ask:

- Look at the colors (browns & greens); how are they different in this photograph than the map on page 24? (Page 24 is a relief map!)
- What do you notice about the colors? What are you seeing in these colors? (tan = desert/arid; green = trees; blue = water; white = ice/snow.)
- How are the shapes different from the map on page 24?
- Now compare your handout maps—the color one (p. 24) and the blackline one. Look at the size of Greenland and Canada; what do you see? (the blackline map is much more accurate, but the color one has the lines of longitude running straight up, as if the world were not round—major distortion as you get closer to the North Pole.)

Find

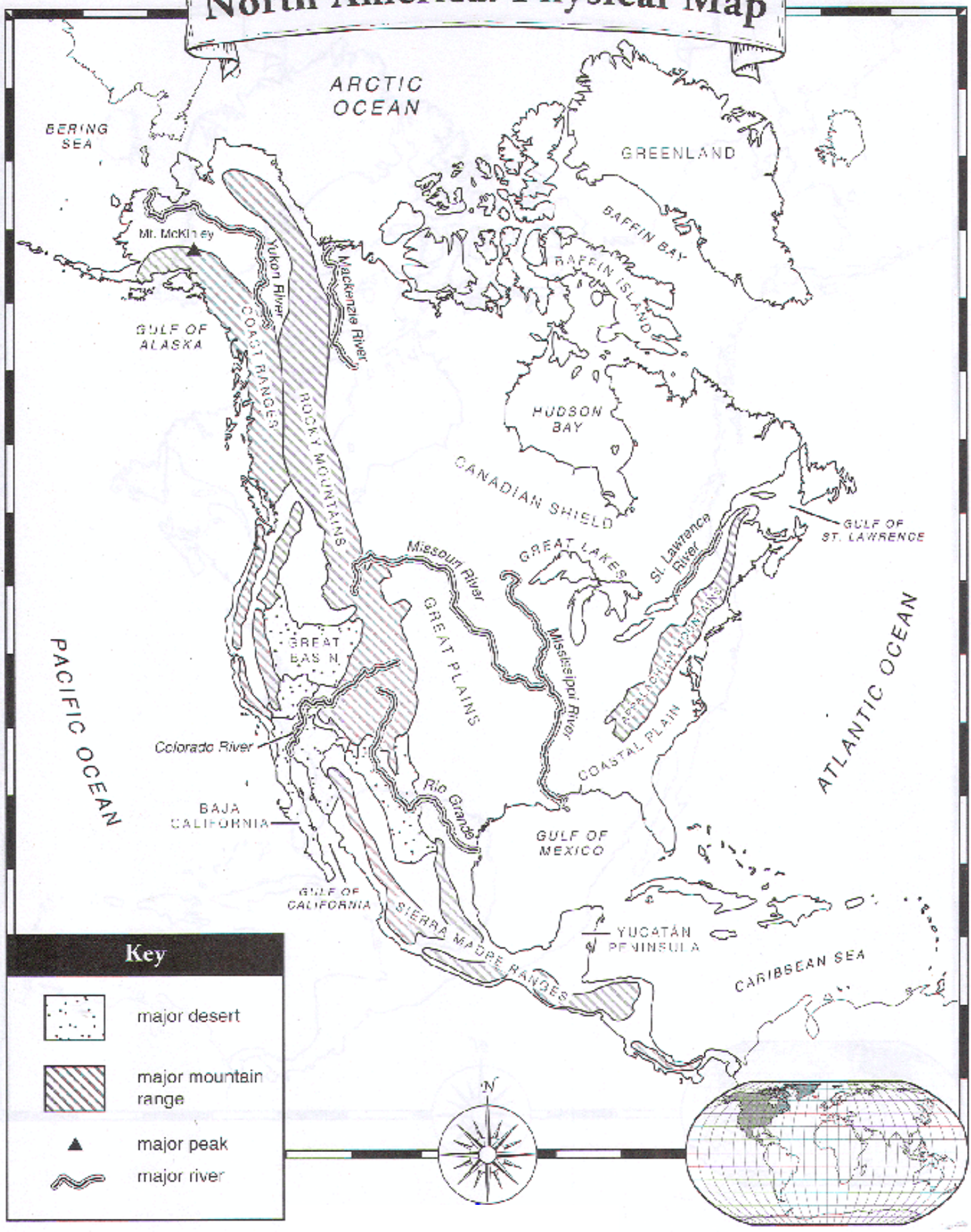
Look at North America Relief & blackline maps (Cartography pp. 24). Let's explore

1. Arctic Ocean
2. Atlantic Ocean
3. Pacific Ocean
4. Caribbean Sea
5. Bering Sea
6. Gulf of St. Lawrence
7. Yukon River
8. Gulf of Alaska
9. Gulf of California

Drill Again

1. Mississippi River
2. Great Lakes
3. Gulf of Mexico
4. Hudson Bay
5. Rio Grande River
6. Red River
7. Colorado River
8. Snake River
9. Arkansas River
10. Missouri River
11. St. Lawrence River

North America: Physical Map




A
B
C
D
E
F
G
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I
J
K
1
2
3
4
5
6
7
8
165° W
150° W
135° W
120° W
105° W
90° W
75° W
60° W
45° W
30° W
15° W
75° N
60° N
45° N
30° N
15° N
Arctic Ocean
Lincoln Sea
ELLESMERE ISLAND
QUEEN ELIZABETH ISLANDS
SVERDRUP ISLANDS
PARRY ISLANDS
KNUD RASMUSSEN LAND
MELVILLE ISLAND
DEVON ISLAND
BANKS ISLAND
PRINCE OF WALES ISLAND
SOMERSET ISLAND
VICTORIA ISLAND
BAFFIN ISLAND
Beaufort Sea
Baffin Bay
North Slope
BROOKS RANGE
Arctic Circle
QEQERTARSUAQ
MELVILLE PENINSULA
Foxe Basin
PRINCE CHARLES ISLAND
Davis Strait
Great Bear Lake
Yukon
Mackenzie
Mackenzie Mountains
ALASKA RANGE
Denali 20,320 ft.
Yukon
Great Slave Lake
SOUTHAMPTON ISLAND
Hudson Strait
Mt. Logan 19,551 ft.
COASTAL MOUNTAINS
Hudson Bay
Labrador Sea
Ungava Bay
Bristol Bay
ALEUTIAN RANGE
Gulf of Alaska
Lake Athabasca
CANADIAN SHIELD
ROCKY MOUNTAINS
GREAT PLAINS
Mackenzie
Churchill
Nelson
Saskatchewan
Lake Winnipeg
James Bay
Laurentide Scarp
VANCOUVER ISLAND
Fraser
Columbia
Missouri
Lake Superior
Gulf of St. Lawrence
NEWFOUNDLAND
Sault Ste. Marie Canal
Ottawa
St. Lawrence
Lake Michigan
Lake Huron
Lake Ontario
Bay of Fundy
Gulf of Maine
Snake
Lake Erie
Cape Cod
Cape Mendocino
Pacific Ocean
Ohio
Mississippi
Atlantic Ocean
APPALACHIAN MOUNTAINS
Chesapeake Bay
Colorado
Arkansas
Red
Cape Hatteras
Channel Islands
Sonoran Desert
Rio Grande
BERMUDA ISLANDS
BAJA CALIFORNIA
Gulf of California
Sierra Madre Occidental
Sierra Madre Oriental
GRAND BAHAMA ISLAND
Gulf of Mexico
ANDROS ISLAND
Tropic of Cancer
YUCATAN PENINSULA
GREAT INAGUA
Bay of Campeche
GREATER ANTILLES
Lesser Antilles
Caribbean Sea
Gulf of Tehuantepec
Lake Nicaragua
Panama Canal
Isthmus of Panama
Gulf of Panama
NORTH AMERICA Physical

GEOGRAPHY

NORTH AMERICA PHYSICAL: LANDS

Cycle 4, Week 26

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

   - North America Relief (*Cartography* book)
   - North America Physical blackline map
   - US Physical Map (*Cartography* book)

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

Drill

1. Rocky Mountains
2. Appalachian Mountains
3. Grand Canyon
4. Yucatan Peninsula
5. Isthmus of Panama
6. Greenland
7. Ozark Mountains
8. Great Plains
9. Great Basin & Great Salt Lake
10. Mt. McKinley (Mt. Denali)

Discover

Turn to *Cartography* pp. 20-21. Questions to ask:

1. Review of Relief Map vs. actual colors of lands (as seen in photographs).
2. Where is the United States on these maps/pictures?
3. Where are the Appalachian Mountains? Where were the 13 original colonies? (See also 13 Colonies map.) Why did they stop where they did? (Appalachian Mountains create a natural barrier.)
4. Where is the Mississippi River? Where was the Louisiana Purchase? (See also 13 Colonies map.) Why did it have that funny border? (Mississippi River creates a barrier.)
5. Where are the Rocky Mountains?
6. Which way does each river flow? Why? (Because they flow downhill.)

Find

Look at all three map handouts (Cartography pp. 24–25).

1. Vancouver Island
2. Mt. St. Helens
3. Baja California
4. Newfoundland
5. Colorado Plateau
6. Yellowstone (giant volcano!)
7. Great Basin & Great Salt Lake
8. Sierra Nevada Mountains (separate California & Nevada)
9. Aleutian Islands

Drill Again

1. Rocky Mountains
2. Appalachian Mountains
3. Grand Canyon
4. Yucatan Peninsula
5. Isthmus of Panama
6. Greenland
7. Ozark Mountains
8. Great Plains
9. Great Basin & Great Salt Lake
10. Mt. McKinley (Mt. Denali)


UNITED STATES Physical
A
B
C
D
E
F
G
H
I
J
K
120° W
110° W
100° W
90° W
80° W
70° W
50° N
40° N
30° N
1
2
3
4
5
6
7
8
Puget Sound
Columbia
Mt. St. Helens 8,363 ft.
Mt. Rainier 14,439 ft.
CASCADES
Columbia
Yellowstone
Old Faithful Geyser
COAST RANGES
Cape Mendocino
Sacramento
Snake
Black Hills
Missouri
Lake Superior
Lake Huron
Lake Ontario
Niagara Falls
Lake Champlain
Adirondack Mountains
Mohawk
White Mountains
Kennebec
Green Mountains
Connecticut
Cape Cod
Hudson
Allegheny Mountains
Lake Michigan
Lake Erie
Wisconsin
Allegheny
Delaware
LONG ISLAND
GREAT BASIN
Great Salt Lake
Lake Tahoe
San Francisco Bay
San Joaquin
Sierra Nevada
Platte
Illinois
Mississippi
Monongahela
Susquehanna
Potomac
Chesapeake Bay
James
Green
Mt. Whitney 14,494 ft.
Death Valley
Mohave Desert
Colorado
Lake Powell
Mt. Elbert 14,439 ft.
Pike's Peak 14,114 ft.
Arkansas
Wabash
Ohio
Mammoth Caves
APPALACHIAN MOUNTAINS
Cumberland Mountains
Blue Ridge Mountains
Roanoke
Cape Hatteras
Pamlico Sound
CHANNEL ISLANDS
Grand Canyon
Colorado
Mt. Mitchell 6,684 ft.
Great Smoky Mountains
Tennessee
Ozark Highlands
Canadian
Salton Sea
Colorado Desert
Sonoran Desert
Painted Desert
Gila
Red
Pee Dee
Savannah
Pacific Ocean
Atlantic Ocean
Rio Grande
Pecos
Brazos
Ouachita
Alabama
Tombigbee
Chattahoochee
Altamaha
Mobile Bay
Mississippi River Delta
Gulf of Mexico
Lake Okeechobee
FLORIDA KEYS
Straits of Florida
Albers equal area projection
0 100 200 300 mi
0 100 200 300 km
0 100 mi
0 100 km
Bering Strait
Yukon
0 200 mi
0 200 km

Geography

North America
Major Cities & Political

Cycle 4, Week 27

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

    - North America Cities & Political
    - North America Cities & Political blackline

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

Drill

1. United States of America
2. Washington, D.C.
3. Canada
4. Ottawa, Canada
5. Mexico
6. Mexico City, Mexico
7. Guatemala
8. Belize
9. El Salvador
10. Honduras
11. Nicaragua
12. Costa Rica
13. Panama

Discover: Briefly go over Canada & Mexico

1. Turn to *Cartography* page 26.
    - Ontario
    - Quebec
    - New Brunswick
    - Prince Edward Island
    - Nova Scotia
    - Newfoundland & Labrador
    - Manitoba
    - Saskatchewan
    - Alberta
    - British Columbia
    - Northwest Territories (territory)
    - Yukon (territory)
    - Nunavut (territory - 1999)
2. Turn to *Cartography* page 36. Mexico has 31 states, but they're not exactly like our states (and much smaller!). These are the two closest to Texas. (Also shown on handout map.)

    Texas was originally part of a province of Mexico called Coahuila y Tejas—but the Mexican rulers broke their constitutions and laws, and finally attacked the Texans, who, fighting back, defeated their attackers, and won their freedom!

    - Coahuila
    - Chihuahua

Drill Again

1. United States of America
2. Washington, D.C.
3. Canada
4. Ottawa, Canada
5. Mexico
6. Mexico City, Mexico
7. Guatemala
8. Belize
9. El Salvador
10. Honduras
11. Nicaragua
12. Costa Rica
13. Panama


ARCTIC OCEAN
Norwegian Sea
RUSSIA
Chukchi Sea
Arctic Circle
Bering Sea
Beaufort Sea
GREENLAND
ICELAND
Reykjavik
Barrow
Nome
Alaska
Yukon
Fort Yukon
Fairbanks
Unalaska
Anchorage
Cordova
Baffin Bay
Godthab
Gulf of Alaska
Yukon Territory
Whitehorse
Mackenzie
Port Radium
Great Bear L.
Nunavut
Iqaluit
Northwest Territories
Yellowknife
Baker Lake
Juneau
Rankin Inlet
Great Slave L.
CANADA
Bear Lake
Fort Chipewyan
Inukjuak
Dawson Creek
Alberta
Churchill
Prince Rupert
Fort McMurray
Manitoba
Hudson Bay
Saskatchewan
Grande Prairie
Newfoundland
Prince George
Thompson
Labrador City
St. John's
British Columbia
Edmonton
Flin Flon
Red Deer
Kamloops
Prince Albert
L. Winnipeg
Calgary
Saskatoon
Quebec
Victoria
Vancouver
Moosonee
Ontario
Swift Current
Regina
Prince Edward Island
Charlottetown
Seattle
Washington
Spokane
Brandon
Winnipeg
Timmins
Amos
Quebec
New Brunswick
Fredericton
Vancouver
Williston
Grand Forks
Minnesota
Maine
Nova Scotia
Halifax
Portland
Helena
North Dakota
Lake Superior
Ottawa
Montreal
Oregon
Montana
Butte
Duluth
Bismarck
Augusta
Concord
Boise
South Dakota
St. Paul
Lake Huron
Boston
Idaho
Twin Falls
Minneapolis
Wisconsin
Lake Ontario
Toronto
Rochester
Providence
Hartford
Milwaukee
Detroit
Buffalo
Wyoming
Michigan
Lake Erie
Reno
Salt Lake City
Cheyenne
Scottsbluff
Nebraska
Iowa
Chicago
Cleveland
New York
Philadelphia
Nevada
Provo
Utah
Omaha
Illinois
Indiana
Pittsburgh
Pennsylvania
San Francisco
Oakland
Boulder
Indianapolis
Dayton
Baltimore
Ohio
West Virginia
Washington D. C.
Las Vegas
Denver
Colorado
Kansas City
Cincinnati
Virginia
Richmond
Norfolk
California
Kansas
St. Louis
Louisville
U. S. A.
Missouri
Kentucky
Nashville
Tennessee
Santa Fe
Oklahoma City
Charlotte
Los Angeles
Arizona
Albuquerque
Memphis
Columbia
San Diego
Phoenix
Oklahoma
Little Rock
Birmingham
Atlanta
Mexicali
Tucson
New Mexico
Arkansas
Mississippi
Alabama
Georgia
Dallas
Jackson
Tallahassee
Jacksonville
Texas
Austin
Baton Rouge
Louisiana
New Orleans
Florida
Orlando
Hermosillo
Chihuahua
San Antonio
Houston
Tampa
West Palm Beach
MEXICO
Rio Grande
Nassau
Monterrey
Miami
Tropic of Cancer
Culiacan
Gulf of Mexico
THE BAHAMAS
La Paz
Durango
Ciudad Victoria
Havana
Zacatecas
PUERTO RICO
San Luis Potosi
CUBA
Tepic
Leon
Merida
Guadalajara
Queretaro
Campeche
DOM. REP.
HAITI
Morelia
Chetumal
Colima
Toluca
Mexico City
JAMAICA
Belize City
Villahermosa
BELIZE
Chilpancingo
Caribbean Sea
Belmopan
Oaxaca
HONDURAS
Guatemala
Tegucigalpa
Caracas
GUATEMALA
San Salvador
Maracaibo
Barranquilla
Barquisimeto
EL SALVADOR
NICARAGUA
Managua
VENEZUELA
San Jose
Colon
Panama
COSTA RICA
PANAMA
Medellin
COLOMBIA
Bogota
PACIFIC OCEAN
ATLANTIC OCEAN
0
1000 Miles
0
1000 KM

North America

GEOGRAPHY

UNITED STATES HISTORICAL

Cycle 4, Week 28

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

   - 13 Colonies map (Living Books Curriculum)
   - American Colonies Predominant Religions map
   - Louisiana Purchase map
   - United States Physical (*Cartography* book, from Week 25, for Bahamas)

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

Historical

1. Bahamas—Christopher Columbus
2. Florida
3. Jamestown (1609)
4. Cape Cod—Pilgrims (1620)
5. New Amsterdam/New York
6. Long Island
7. 13 Colonies
8. New Orleans/Mississippi River—Louisiana Purchase
9. Ohio River—Underground Railroad/slave states vs. free states

Discover

1. Florida was the first part of North America to get explored by Europeans; who first explored Florida? (The Spanish—Ponce de Leon, da Vaca (who was the first to enter Texas!), and Hernando DeSoto.) Who were the first to create a successful settlement in North America? The French Huguenots, escaping Roman Catholic persecution, established Fort Caroline (near modern day Jacksonville) in 1564. However, the Roman Catholic Spanish saw their successful settlement and massacred them (just as the Roman Catholic French massacred the Huguenots, back home—note especially the St. Bartholomew's Eve massacre); the Spanish set up their own settlement nearby in St. Augustine.
2. Why were the first English settlements in North America at Jamestown and Cape Cod? (Good harbors for docking ships, and good land for settling.) How did Jamestown get its name? (To honor King James I.) Why did the Pilgrims come to America? (For religious freedom, which King James would not allow.)
3. New Amsterdam, in New Netherland, was purchased from the Manhattan Indians in 1624, for $24. Who started that colony? (The Dutch.)
4. Why were the Europeans able to come to this land, where people were living, and settle land? (The Indians, or Native Americans, did not believe in taking dominion over the earth, as God commands us to do. There is evidence that there had been great civilizations in North America, at some time in the past—we see that in the Rock Wall in Rockwall, Texas, for example! But these people did not keep any written records that we know of, so we do not know much about them, or how their civilization fell. When the Europeans arrived, the Indians were scattered into hundreds (thousands?) of different tribes, which did not farm, did not build homes or structures, and mostly lived in tents, wandering around this huge continent. They did not have towns, cities, farms, ranches, roads, or anything else. The land was either freely available, or sold by the Indians quite cheaply, because they did not value it.)
5. Where are the Appalachian Mountains? Where were the 13 original colonies? (See also 13 Colonies map.) Why did they stop where they did? (Appalachian Mountains create a natural barrier.)
6. You *must* be able to name the 13 original colonies (and find them on a map).
7. Characters of the English colonies, as seen in which denomination founded each:

    - Massachusetts—Congregational (like Baptist, just without believer's baptism)
    - Virginia—Church of England (Anglican/Episcopalian)
    - Pennsylvania—William Penn founded, for religious liberty
    - Almost entirely settled by Protestant Reformed (Calvinist) Christians, or people professing that religion
    - See Predominant Religions map.
8. Where is the Mississippi River? Boundaries of the Louisiana Purchase: Mississippi River was the Eastern border, and the Southern and Western borders were defined thusly: This line followed the Sabine River from the Gulf of Mexico to the parallel of 32° N; ran thence due north to the Red River, following this stream to the meridian 100° W; thence north to the Arkansas River and along this stream to its source; thence north or south, as the case might be (the source of the Arkansas was not then known), to the parallel of 42° N and west along this line to the Pacific Ocean.
9. As Abolitionism gained political momentum, it came to be that the states north of the Ohio River did not allow slavery, and the states south of it, did.

Drill Again

1. Bahamas—Christopher Columbus
2. Florida
3. Jamestown (1609)
4. Cape Cod—Pilgrims (1620)
5. New Amsterdam/New York
6. Long Island
7. 13 Colonies
8. New Orleans/Mississippi River—Louisiana Purchase
9. Ohio River—Underground Railroad/slave states vs. free states

TERRITORIAL GROWTH

Colonial Period: 1775

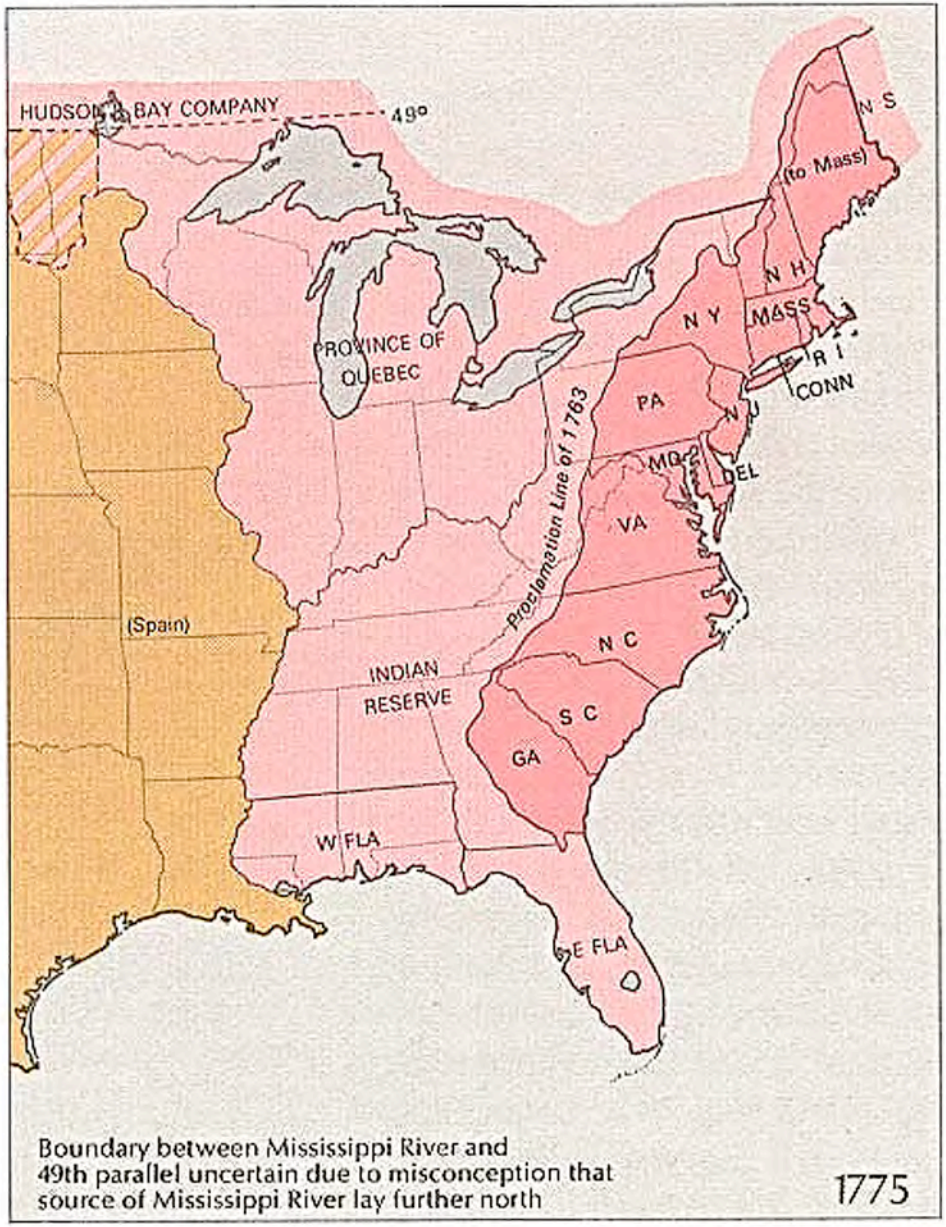
- Original Thirteen Colonies
- Other British territories

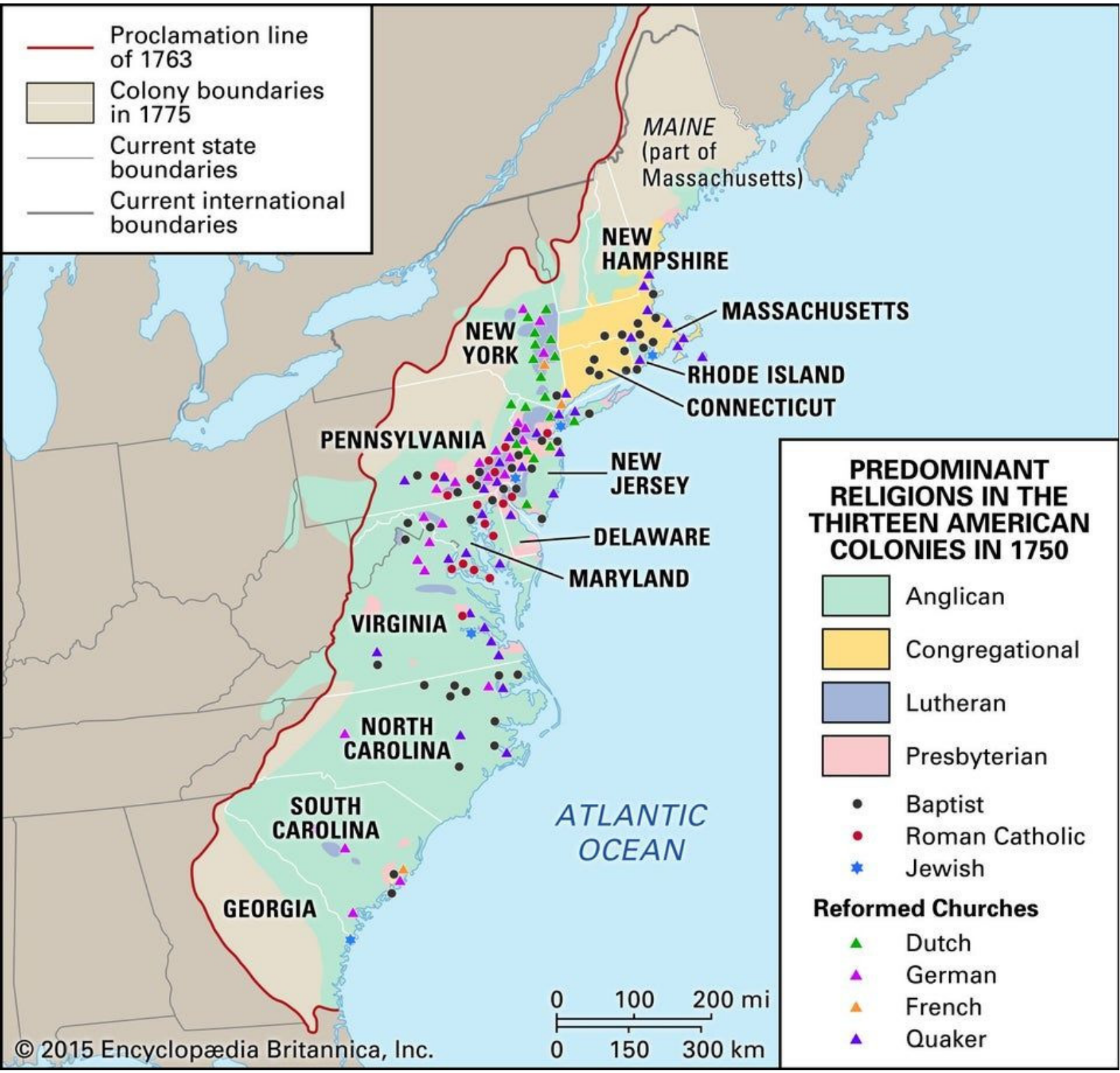
United States: 1790-1920

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

1803 Dates of territorial acquisitions
1805 Dates of initial territorial organizations
(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




Proclamation line of 1763
Colony boundaries in 1775
Current state boundaries
Current international boundaries
MAINE (part of Massachusetts)
NEW HAMPSHIRE
MASSACHUSETTS
NEW YORK
RHODE ISLAND
CONNECTICUT
PENNSYLVANIA
NEW JERSEY
DELAWARE
MARYLAND
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ATLANTIC OCEAN
0 100 200 mi
0 150 300 km
PREDOMINANT RELIGIONS IN THE THIRTEEN AMERICAN COLONIES IN 1750
Anglican
Congregational
Lutheran
Presbyterian
Baptist
Roman Catholic
Jewish
Reformed Churches
Dutch
German
French
Quaker
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CANADA
THE LOUISIANA PURCHASE FROM FRANCE 1803
New Orleans
MEXICO
PACIFIC OCEAN
ATLANTIC OCEAN
GULF of MEXICO
O·W·J

Geography

United States
States

Cycle 4, Week 29

Key Verse:
The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Have children sit around their mothers, so they can look at the pictures in *Exploring the World Through Cartography* with her.

2. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

    - United States: States & Capitals map

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

United States

Turn to *Cartography* page 30. Go over states & capitals, by region. In these 30 minutes, try to help the children learn all 50 states, as well as possible.

A. 13 Original Colonies

1. New Hampshire
2. Massachusetts
3. Rhode Island
4. Connecticut
5. New York
6. New Jersey
7. Pennsylvania
8. Delaware
9. Maryland
10. Virginia
11. North Carolina
12. South Carolina
13. Georgia

B. Eastern & Southern States

1. Maine
2. Vermont
3. Kentucky
4. Tennessee
5. Alabama
6. Mississippi
7. Florida
8. Louisiana
9. Arkansas

C. Midwestern States

1. West Virginia
2. Ohio
3. Indiana
4. Illinois
5. Michigan
6. Wisconsin
7. Missouri
8. Iowa
9. Minnesota

D. Our row of states (right in the middle) & Hawaii & Alaska

1. Texas
2. Oklahoma
3. Kansas
4. Nebraska
5. South Dakota
6. North Dakota
7. Hawaii
8. Alaska

E. Western States

1. Montana
2. Idaho
3. Washington
4. Oregon
5. California
6. Nevada
7. Arizona
8. New Mexico
9. Colorado
10. Wyoming
11. Utah

nationalatlas.gov ™
Where We Are

STATES AND CAPITALS

U.S. Department of the Interior
U.S. Geological Survey

The **National Atlas** of the United States of America®

states_capitals2.pdf INTERIOR-GEOLOGICAL SURVEY, RESTON, VIRGINIA-2003

Geography

Texas

Cycle 4, Week 30

Key Verse:

The earth *is* the Lord's, and all that therein is; the world and they that dwell therein.
Psalm 24:1

Getting Ready

1. Pass out map handouts and colored pencils. (They may trace or color the blackline map, but the other maps are for them to look at; they may *not* color on those.)

    - Texas Historical map
    - Texas Regions blackline map

To Start

1. Review Key Verse.

2. GEOG'RAPHY, noun [Gr. the earth, and to write, to describe.] Properly, a description of the earth or terrestrial globe, particularly of the divisions of its surface, natural and artificial, and of the position of the several countries, kingdoms, states, cities, etc. As a science, geography includes the doctrine or knowledge of the astronomical circles or divisions of the sphere, by which the relative position of places on the globe may be ascertained, and usually treatises of geography contain some account of the inhabitants of the earth, of their government, manners, etc., and an account of the principal animals, plants and minerals. (Noah Webster's 1828)

3. CARTOGRAPHY is the science or art of making maps. (M-W.com)

Geography

Drill

1. Prairies & lakes region
2. Pineywoods
3. Hill Country
4. Panhandle Plains
5. Gulf Coast
6. South Texas Plains
7. Big Bend Country
8. The Alamo (San Antonio, the Bexar—all right there together)
9. Barrier islands—our gulf coast is lined with them, giving us a great coast!
10. Fannin County
11. Bonham

Discover

1. Where is Texas on the North America relief map?
2. Why is Texas shaped like it is? How much of Texas' boundary is based on natural boundaries, and how much is artificial? (Red River, Rio Grande, Sabine River are natural boundaries with OK, Mexico, & LA.)
3. Recommendation: Jeff Young's Christian History of Texas class lectures; they are *wonderful!!!*—Sermon Audio: https://www.sermonaudio.com/search.asp?sourceOnly=true&currSection=sermonssource&keyword=grbcbonham&subsetcat=series&subsetitem=Christian+History+of+Texas
4. Look at Texas Historical map for history tidbits. ☺

Find

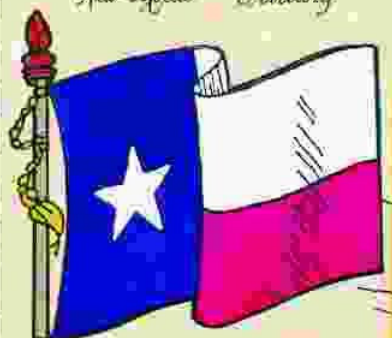
1. Honey Grove
2. Leonard
3. Bells
4. Dallas
5. Fort Worth
6. Austin
7. Houston
8. Tyler
9. Etc.

Drill Again

1. Prairies & lakes region
2. Pineywoods
3. Hill Country
4. Panhandle Plains
5. Gulf Coast
6. South Texas Plains
7. Big Bend Country
8. The Alamo (San Antonio, the Bexar—all right there together)
9. Barrier islands—our gulf coast is lined with them, giving us a great coast!
10. Fannin County
11. Bonham

Texas 1850

Texas became the 28th State to join the Union December 29, 1845.
(admitted as *slave state* and joined the *Confederate States of America* Feb. 1, 1861)



The State Flag of Texas is the oldest State flag in the contiguous United States adopted in 1839. (The Hawaii flag dates back to 1816, other states did not adopt their *State Flag* until the Civil War era and after)...The Texas flag was adopted when Texas was an independent *Republic*...and was carried over to *Texas Statehood* in 1845...The red, white and blue design, with its single Lone Star, is symbolic of the *Americans* who fought for and won their independence from Mexico in 1836.

Sept. 9, 1850 - The Compromise of 1850: Texas Statehood boundaries became established by the United States Congress. The Adams-Onis Treaty served as the basis for the *eastern* boundary; ..."From the mouth of the Sabine River upstream to the 32° parallel; thence due north to the Red River...follow the Red River upstream to the 100th meridian. From this junction, due north to the 36° - 30' parallel; thence west to the 103rd meridian; thence south to the 32° parallel; thence west to the Rio Grande"...The Rio Grande was established as the *natural western* boundary by the *Republic of Texas* in 1836...All territorial claims beyond the boundaries so outlined were ceded to the United States, which became part of the established *Territories* of the *New Mexico*, and *Utah Territory*...*The State of California* was then admitted as the 31st state of the Union.

New Mexico Territory became New Mexico - 1912

Unorganized Territory

The Adams-Onis Treaty Line of 1819

became Oklahoma - 1907

Arkansas 6-15-1836

Louisiana 4-30-1812

Bexar County

El Paso County

Presidio County

Kinney County

Webb County

Nueces County

Starr County

Cameron County

MEXICO

State of Texas
1850
Population - 154,034
Counties - 90
State Capital - Austin
5 Largest Cities:
(1) Galveston (2) San Antonio
(3) Houston (4-5) A tie between Nacogdoches and Palestine

1836-The Republic of Texas

The Texas Declaration of Independence from Mexico was initiated March 2, 1836...The fall of the *Alamo* on March 6 added stimulus to the *Texas Revolution* and hastened the birth of a new *Republic*. The Texas *(American)* victory at the Battle of San Jacinto over the Mexican army and General Santa Anna, *President of Mexico*, on April 21, 1836 was the culmination of the revolution...*The Treaty of Velasco*, documented and ratified on May 14, 1836, recognized *Texas* as a Free and Independent *Republic*.

1845-The Annexation of the Republic of Texas

The United States annexed the *Republic of Texas* on December 29, 1845 and became the 28th State to join the the Union.

1850-The State of Texas

The boundary lines of the *State* were finally outlined and established in the *Compromise of 1850*.

Compiled & Engraved from the most Reliable and Authentic Rivers and Mountain Ranges recorded in Archives and United States Geological Survey maps.

Special Credit: Robert Greenhow, Cartographer, Chief Clerk Commissioner Texas, 1840-1850

Published by Rand McNally & Company

Texas joins the Union - 1845