

Chapter 5

LABORATORY MANUAL

Comparing Maps 19

A globe is the best model or picture of Earth because it is shaped like Earth itself. However, a globe would be rather difficult to fit into your pocket. Geographers have designed several different flat models of Earth. These flat models, called maps, can be folded or printed in the book.

Strategy

You will compare some map projections.

You will observe disadvantages of each type of map.

You will consider the probable best use of each type of map.

Materials

globe	Homolosine map, Figure 19-2	4 sheets tracing paper
graph paper (metric)	Mercator map, Figure 19-1	

Procedure

- Record the scales of the globe and your maps in Table 19-1.
- Using the tracing paper, trace the outlines of Greenland, North America, and South America from the globe and Figures 19-1 and 19-2. Include Greenland in your tracing of North America.
- Place the globe tracings of Greenland, North America, and South America over metric graph paper. Determine their areas in cm^2 by counting the number of square centimeters contained in each tracing. Count only squares that are totally or more than half contained within the boundaries of the tracings.
- Determine the areas of Greenland, North America, and South America in square kilometers by performing the following calculation. . . .
 Globe or map area in cm^2 multiplied by the scale of the map squared equals the area on Earth in cm^2 . This value is then divided by 10 000 000 000 (1×10^{10}), to obtain the area in km^2 . (There are 10 000 000 000 or 1×10^{10} cm^2 in one km^2 .) Record the areas in Table 19-1.
- Using the procedures in steps 3 and 4, determine the areas of Greenland, North America, and South America in square kilometers on the Mercator and homolosine maps and record these areas in Table 19-1.
- Compare the latitude and longitude lines on the map with these lines on the globe. Record your observations in Table 19-2.

Data and Observations

Table 19-1

Landmass	Area (km^2)		
	Globe	Mercator map	Homolosine map
Greenland			
North America			
South America			
Scale			

Table 19-2

Model	Latitude	Longitude
Globe		
Mercator map		
Homolosine map		

Questions and Conclusions

1. Why does Greenland appear so large on the Mercator map? _____

2. How do Greenland and South America actually compare in size on the globe? _____

3. Which of the two maps represents more correctly the sizes of Greenland and South America?

4. Which of the two maps is a truer model of Earth's landmasses? _____
5. What happens to the longitude circles on a Mercator map? _____
What happens to latitude lines on a Mercator map? _____
6. What happens to the latitude lines on a homolosine map? _____
7. Why would a Mercator map be more useful than a homolosine map to an airplane pilot?

8. If you were asked to map the route you follow to school, would you make a Mercator map or a homolosine map? _____ Why? _____

Strategy Check

- ___ Can you compare maps?
- ___ Can you see disadvantages of each map?
- ___ Can you determine the best probable use of each type of map?

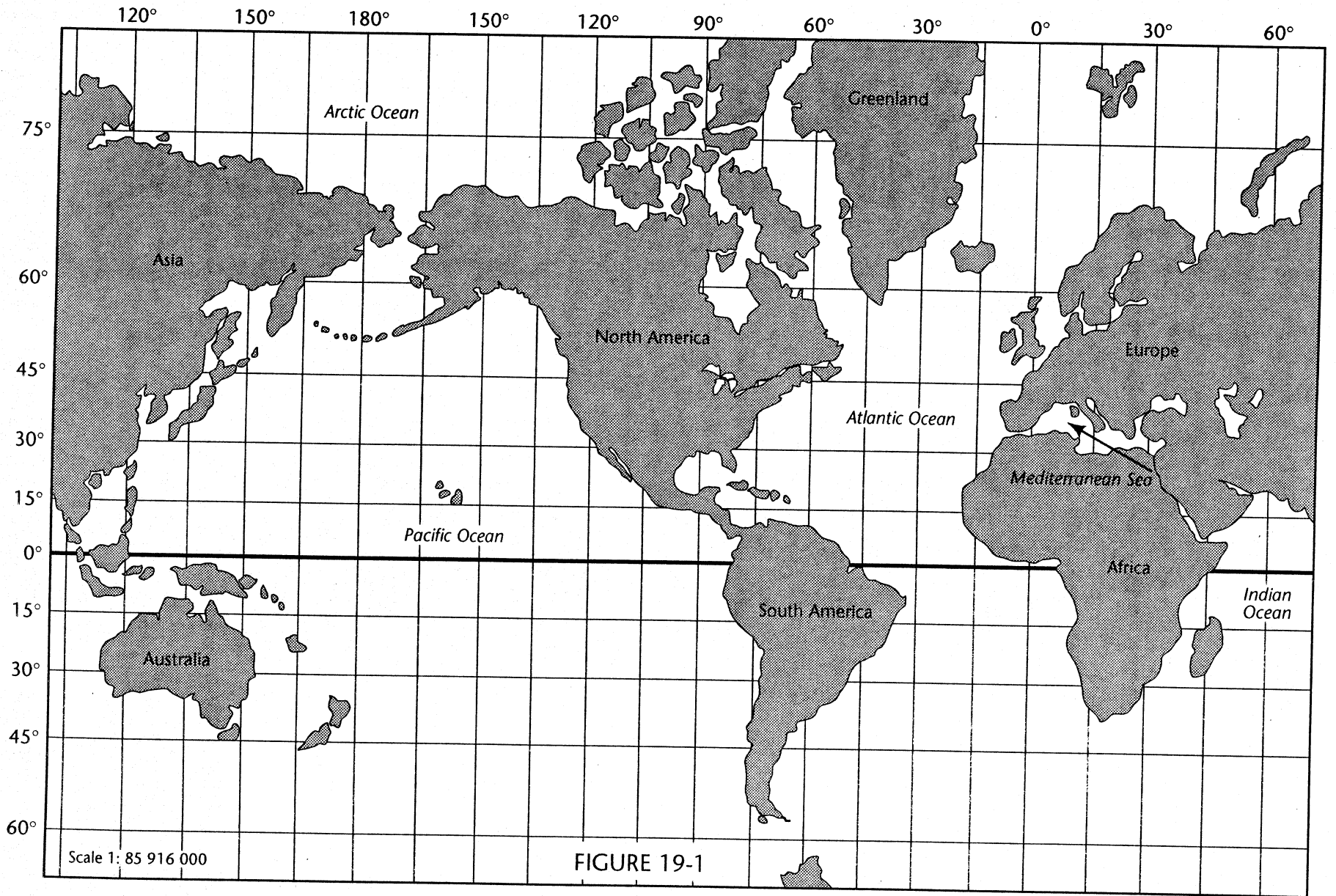


FIGURE 19-1

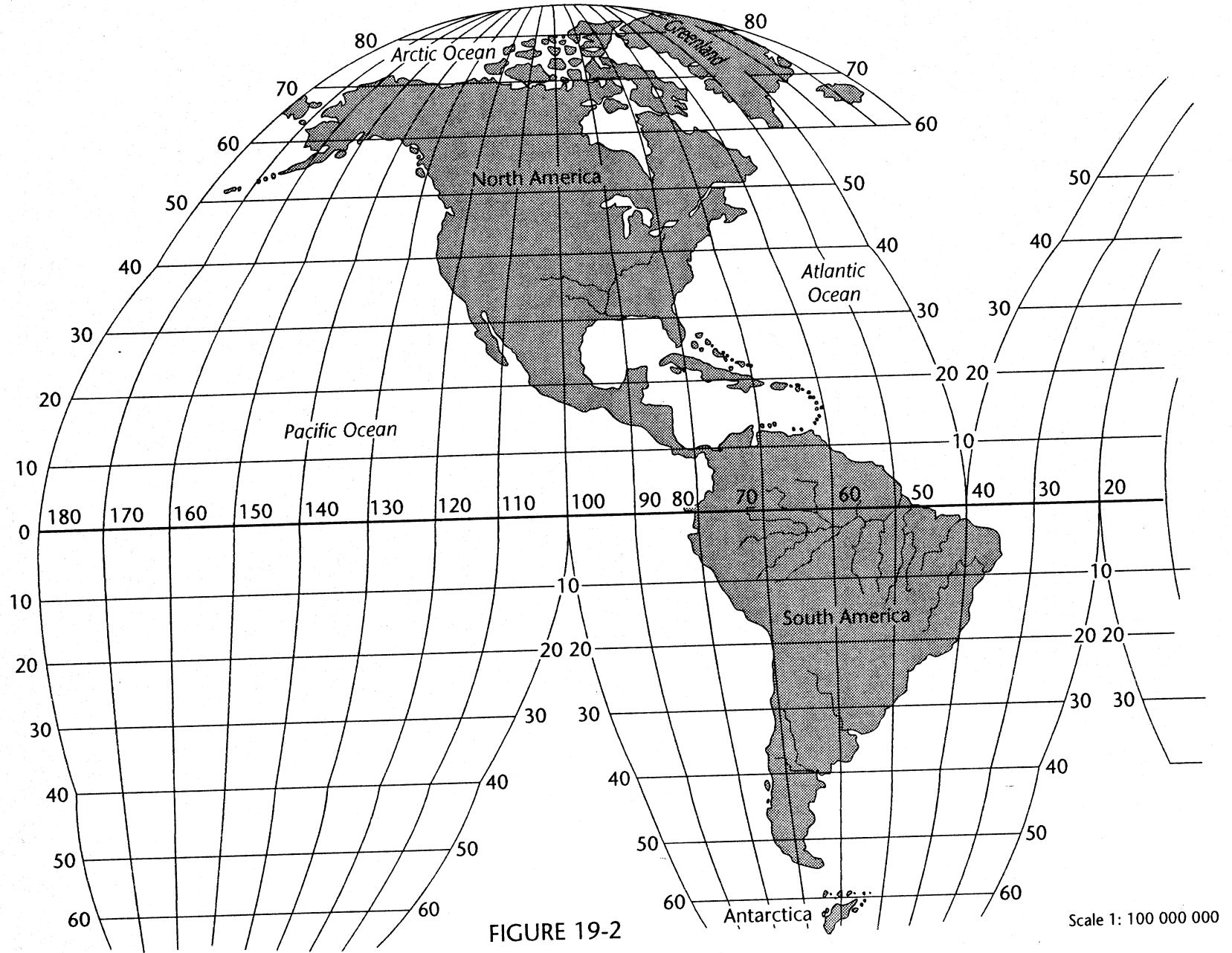


FIGURE 19-2

Scale 1: 100 000 000