# *CHAPTER TWO*

# HISTORY OF MAPS

## 2.1 Introduction

Maps are so much a part of our lives today we don't give them a second thought. Weather maps on TV and in the newspapers help us plan our activities. Road maps help us get quickly from place to place. Because of maps, we know what our world and others look like. We know that Italy is shaped like a boot and the Great Lakes make Michigan's lowerpeninsula looks like a mitten. We know that there are mountains in Asia and deserts in Australia. We can study the bottom of the ocean without getting anywhere near the water and check out the craters on the moon without putting on a space suit. We can count the volcanoes on Mars and locate stars in the sky. All thanks to maps. Maps have existed for thousands of years, but the earliest maps weren't commonly available. Nor were they detailed, wide-ranging, or accurate.

## 2.2 History of maps

The history of maps ran through many stages

### 2.2.1 The First Maps

Experts think that some cave drawings made by the earliest humans may have been maps. If this were true, it would mean that maps existed 37,000 years ago. There is no proof of this, however. What we do know is that the Babylonians, living in what is now Iraq, made the oldest known map in 2300 B.C. This map was scratched on a

clay tablet and shows someone's property, set in a river valley between two mountain ranges. An early Babylonian map of the world is shown at left. Egyptians were also among the first map-makers. The oldest existing Egyptian map dates to about 1300 b.c. and shows the site of a gold mine in what is now Sudan. These maps showing property, towns, or other local areas were among the most common kinds of early maps. Maps of the world that was known would not have been as useful as local maps. Property maps, for example, were used by rulers to set taxes rates for their subjects. It took the rise of ancient Greek civilization to spur an interest in knowing what the whole world looked like. Later, as explorers ventured forth to claim land, wealth, or fame for themselves and their countries, world maps became more important. By the 500s B.C., Greece was the center for scientific study and learning in the ancient world. The Greeks' geographic studies and mapmaking influenced cartographers for more than 1,500 years. As others had done before them, early Greek cartographers described and mapped their own territories. But they also mapped as much of the rest of the world as they could piece together through travel and their knowledge of astronomy and mathematics. Maps were common feature of ancient Greek life. Although none of those early maps have survived, we know about them from the many ancient Greek writings that describe them. Most people at that time thought that Earth was flat. The Greeks, however, described a round Earth and debated the size of it. About 200 B.C. a poet and mathematician calculated that Earth measured 25,000 miles (40,233 kilometers) around its circumference. He was amazingly to the true

circumference, which is 24,902 miles (40,075 kilometers). Later Greek scientists criticized Eratosthenes's calculations, however, and ended up using a figure of 18,000 miles (28,967 kilometers) for Earth's circumference. This mistake was to have a long-lasting effect on both mapmaking and on the navigators who used maps.

### 2.2.2 The Middle Ages

During the Middle Ages, about A.D. 400-1450, scientific learning became less important than religion. And maps of that time reflected this change. The center of the Christian faith was Jerusalem, so that city often occupied the center of a world map. Because paradise was thought to lie eastward, east was located at the top of a map, in the direction of Heaven. In addition, Biblical places such as the Garden of Eden shared map space with actual cities. Maps were often wonderfully colored and decorated with fanciful people and animals. Although world maps were more pretty than practical, two very useful kinds of local maps were produced during the Middle Ages. There were road maps showing people the way to holy shrines and cities.

### 2.2.3 The First Modern Atlas

The map you have copy of a map that appeared along with 70 others in a volume published by Ortelius in 1570. It was called the Threaten Orbis Terrarum , It considered the first modern atlas. An atlas is a collection of maps bound into a single book. Before there were atlases, maps were collected loose in folders. Atlases were first put together by the Italians in the mid-1500s. Each volume was created as a special order for a single customer, who chose the maps to be

included. Unlike the Italian atlases, the maps in Ortelius's volume had a standard appearance because Ortelius redrew them all from the originals. The book was printed in multiple copies so that more than one person could own one. The first books of maps, including Ortelius's, did not have the atlas in their titles. However, many volumes included a picture of Atlas the giant from Greek mythology who held the world on his shoulders. The first book actually called an "atlas" was published in 1585 by the Belgian cartographer Gerardus Mercator.

### 2.2.4 The Mercator Atlas

Mercator's most outstanding achievement was not his atlas, however; but a world map that he created in 1569. The map was laid out as a rectangle, so that the lines of latitude and longitude crossed each other at right angles. This was quite different from other maps of Mercator's time. They were either laid out as ovals, like Ortelius's map, or as circles. On an oval map, the lines of longitude curve rather than going straight up and down, and on a circular map the lines of longitude and latitude curve. Although Mercator's projection greatly distorted the size of the land masses, his map was extremely valuable to sailors, since it allowed them to easily plot straight-line courses across the oceans. By the 1600s, maps based on Mercator's projection were widely used by mariners. The Mercator projection is the most commonly used map projection today.

## 2.3 Tools for Mapmakers and Navigators

As navigators traveled the oceans and discovered had to have some way of telling where they discoveries could be properly plotted on a map. Several tools came to be especially important in determining direction and position.

### 2.3.1 Compasses

Compasses were used in China in about A.D. 1000 and in Europe by the 1100s. The first mariner's compass was simply a magnetic needle mounted on a bit of wood or cork that floated in a bowl of water. By the 1200s, these early compasses were in general used by navigators. Sometime later, probably in the 1300s, the needle was mounted on a wind rose, and the whole became a compass rose a circle of points showing direction based on magnetic north. For this reason, north became the most important point and, to this day, the main direction noted by a map's compass rose.

### 2.3.2 Astrolabes

The Greeks invented the astrolabe in the second century B.C., and the Arabs refined it around A.D. 600. An astrolabe was a flat metal ring marked off in degrees, a rotating bar in the center. This instrument could be used to measure the altitudes of stars, planets, the sun, and the moon.

### 2.3.3 Sextants

The sextant, pictured on the left, came into use in 1757. It gained favor with navigators because it was a bit smaller than the quadrant

and easier to use. The sextant derived its name from the fact that it could measure upto a 60-degree angle, or one-sixth of a circle.

### 2.3.4 Chronometers

In 1714, the British parliament offered a reward to the first person who could invent a reliable way of measuring longitude at sea. It took until 1765 for an English watch-maker named John Harrison to come up important with the right timepiece chronometer, perhaps the most important navigational tool that as developed. It was a clock that accurately measured time at sea. It was necessary to reliably establish the time in order to establish Longitude. The world is divided into 360 degrees of longitude which, in time, equals 24 hours. Therefore, 15 degrees of longitude are equal to one hour. A chronometer was set to whatever the baseline time was. That is the time at the prime meridian, which was 0 degrees longitude and was the point from which the longitude was measured. A navigator compared his locational time to "prime time," indicated by the chronometer.

By knowing how much time had elapsed, he could determine how far east or west of 0 degrees longitude he had traveled and, thus, the longitude of his present position. In 1884, Greenwich, England, was adopted as the international prime meridian. Before then, different countries used different places as their prime meridian. Usually it was the capital city. Therefore, the same area shown on different maps could have different longitude coordinates, depending on the mapmaker's nationality. The importance of the chronometer was quickly noted. Captain James Cook used it on his Pacific

explorations after 1772, allowing for the precise mapping of the Pacific islands for the first time. For the next one hundred years, exploration increased as people set out to discover as much as possible about both new and old lands, as well as the oceans and seas connecting them. This, in turn, led mapmaking efforts both to guide explorers and to record their discoveries.

## 2.4 Mapping in Sudan

Mapping, and/or spatial data collection, can generally be categorized into either planimetric or topographic methods. Planimetric maps show only the horizontal positions of features (x,y coordinates). On the other hand, topographic maps show planimetric details and elevation information (x, y, z co-ordinates).

Modern topographic maps are invariably produced by photogrammetric and high resolution satellite data such as IKONOS, Quick bird or Geo Eye. Production of such maps is a very expensive and time-consuming work. It requires: costly aerial photos or satellite imagery, photogrammetric stations, terrestrial data, and software, and qualified personal.

Full and accurate topographic coverage is still unavailable in Sudan. Most available maps in Sudan survey authority are in hard copies which are now being converted into digital form.

There are three categories of maps in Sudan:

1:1000000 map series: International map of the world, there are about 16 map sheets covering the whole country. Sheets were

compiled, drawn and printed by Sudan Survey Department-Khartoum (1932-1975).

1:250000 map series: there are about 176 sheets covers the whole country. Each sheet is about 110×160km, produced in 1936 through 1976.Projection Transverse Mercator , spheroid Clarke 1880,datum Adindan ,unit of measurement meter ,scale at origin 0.9996,and vertical datum mean sea level at Alexandaria.

1:100000 map series: cover selected areas of the country. Only 159 sheets were produced in 1967, 1980 and 1983, each map including about 30 layers. Projection Transverse Mercator ,spheroid Clarke 1880,datum Adindan ,unit of measurement meter ,scale at origin 0.999 ,and vertical datum mean sea .

1:50000 map series : cover selected areas of the country. Only 2 sheets were produced in 1970 through 1972.Sheets were prepared by Sudan Survey Department, compiled in 1967 by photogrammetric method from aerial photography taken in 1965,projection Transverse Mercator ,spheroid Clarke 1880 and vertical datum mean sea level at Alexandria.

1:25000 map series: Cover selected areas of country. Only 70 sheets were produced in 1970, cover Khartoum province and printed by Sudan Survey Department.

Therefore, we can say that large scale maps are still required to cover the country.