DEVELOPMENT OF GEOGRAPHICAL THOUGHT

(CLASSICAL AND MEDIEVAL PERIOD)

Programme : Five year Integrated M.Sc., Geography / M.Sc., Geography

Course : Cartography

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Introduction

The discipline of geography has a history that stretches over many centuries. The historical development of the discipline studied under several phases. Examining this development it provide insights concerning its nature and methodology.

- 1200 B.C
- 1200 B.C-500 A.D
- 500 – 1100 A.D

Greek Geography

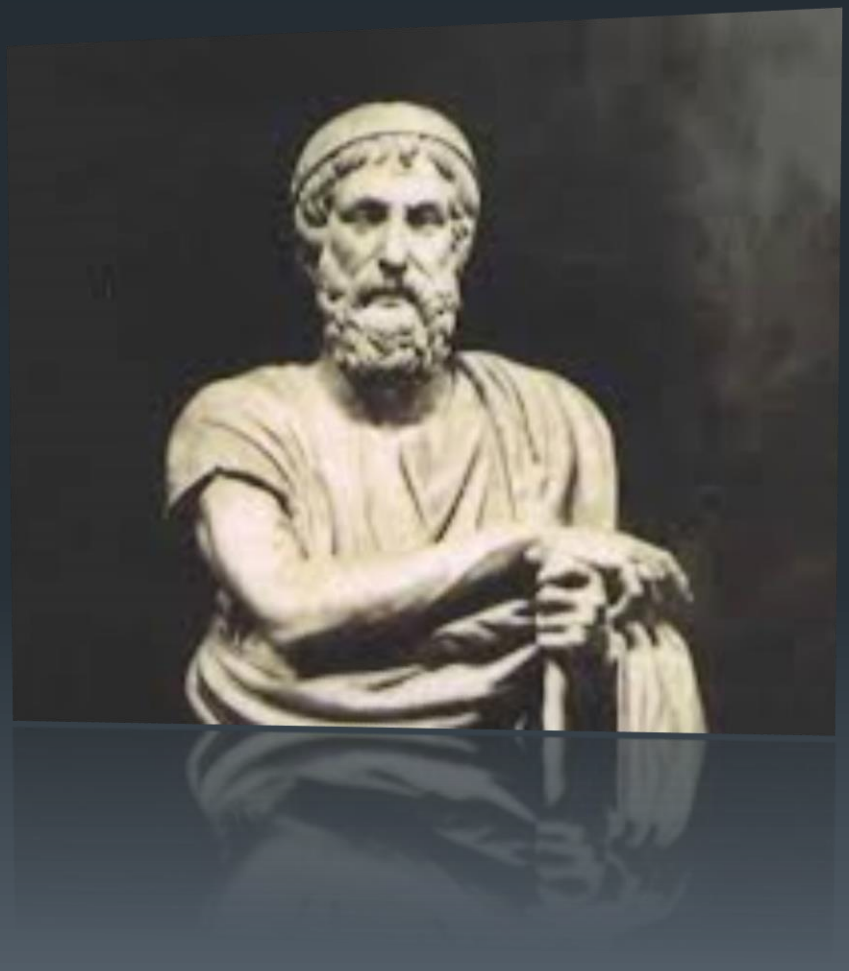
The Greeks were pioneers in many branches Of knowledge. Their period is known as the" *Golden Age of Greece*". They borrowed many of the concepts of astronomy , geometry and mathematics from Egyptians and Assyrians.

Between 5th and 3rd century B.C they were established parts of the Mediterranean sea and Black sea.

Homer

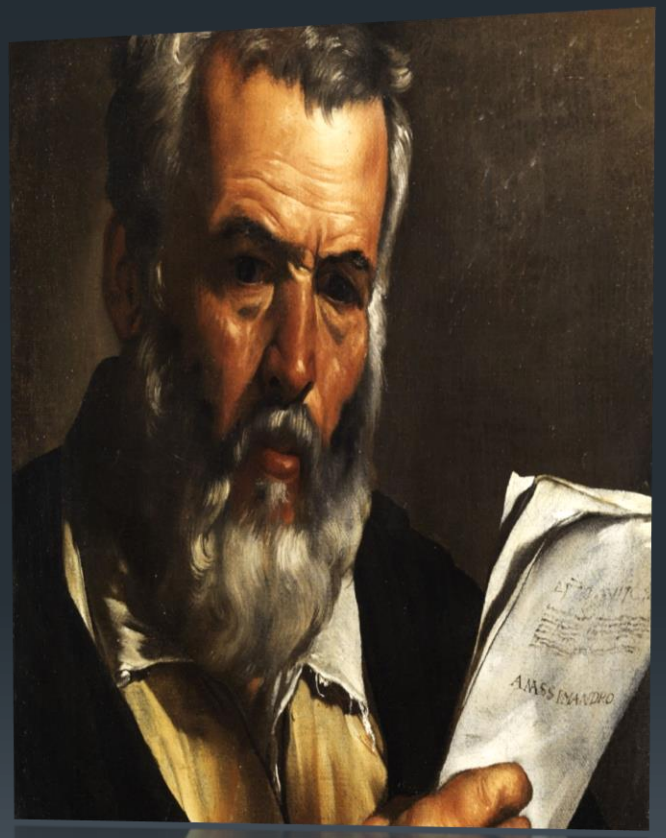
Homer was a very well-known Greek. He was probably the greatest Greek poet

Homer described the **four winds** coming from the four different directions. Bores was the north wind, strong and cool with clear skies; eurus was the east wind, warm and gentle; notus was the south wind on the front of an advancing storm, wet and sometimes violent; and Zephyrus was the west wind, dreaded, balmy with gale force



Anaximander

Anaximander was a disciple of Thales in Miletus. He is credited with the introduction into the Greek world of a Babylonian instrument known as '**gnomon**'. Gnomon is a pole set vertically above a flat surface on which the varying position of the sun could be measured by the length and direction of the shadow cast by the vertical pole.



- Anaximander was a pioneer. He prepared a world map to scale, though the Sumarians before him had drawn pictorial maps of some of their cities as early as 2700 BC. In this map, *Greece has been shown in the centre of the world*. The map was circular and was bounded on all sides by the Ocean river. Thales and Anaximander are generally recognized as the founders of mathematical geography.

Hecataeus

Hecataeus was a resident of Miletus. Very little is known about his date of birth and early life but he was a great statesman and pioneer geographer. He was the first writer of Greek prose.

- Hecataeus collected and classified information of the known Greek world and the unknown distant areas.
- His main book is Gesperiodos (description of the earth) which was published most probably before the end of the 6th century. It is the *first systemic description* of the world and because of this fact *Hecataeus is known as the father of geography*. It also gives a detailed account of the **Mediterranean Sea, islands, straits, and describes the general outline of all the countries of the world.**
- The world map prepared by Hecataeus was *based on the map of Anaximander* - the great mathematical geographer who made the first map of the world.

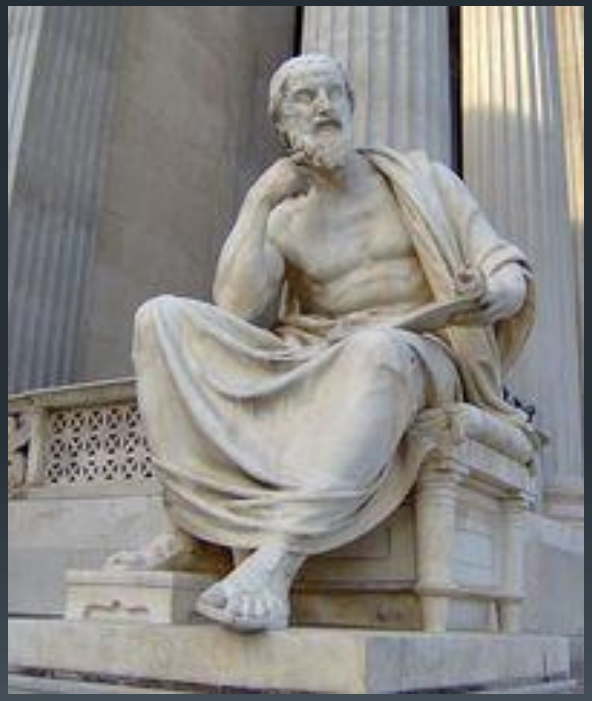
- The work of Hecataeus was divided into two books: the first book contains geographical information of Europe and the second deals with Libya.
- So far as the shape and size of the earth is concerned, Hecataeus maintained the traditional view of the Ionian philosophers that the *earth is a circular plane and Greece is in the centre of the world*. The world was assumed as surrounded by Ocean river. The landmass was divided into two equal parts, i.e., *the continent of Europe towards the north and that of Libya (Africa and Asia) to the south*.

Herodotus

Herodotus was born at Halicarnassus in 5th century B.C. He stayed at Athens , afterwards from Athens in 433B.C he went to Thurii- a town in south Italy.

He was a great traveller and his contribution to Geography is remarkable

He was the first and foremost historian and is regarded as the "**Father of history".**



- He was also one of the pioneer geographers. He was a strong supporter of idea that *all history must be treated geographically and all Geography must be treated historically.* His work is an excellent example of Historical geography.
- Herodotus views about the shape of the earth were not in conformity with those of Hecataeus that the earth, as a circular plane, is surrounded by an ocean stream. He accepted the *Homeric View of the earth as a flat disc* over which the sun travelled in an arc from east to west.
- In spite of all unscientific beliefs ,he was first scholar who tried to *draw a meridian on world map*.

- Herodotus was also the first scholar who divided the world landmass into three continents, namely, Europe, Asia and Libya (Africa) .The size of Europe has, however, been taken as equivalent to Asia and Libya (Africa) combined.
- It would be worthwhile to examine in brief the knowledge which he possessed about the physical features and tribes of these three continents.

Eratosthenes(276-194 B.C)

Eratosthenes was born in the Greek colony, Cyrene (Libya), in 176 B.C. He got his education at Cyrene and then at Athens. From Athens he was invited by the ruler of Egypt, Ptolemy Euegetes, and appointed chief librarian of the Library of Alexandria, This post was considered to be the highest academic honor of that period. He served in that capacity for about forty years until his death in about 196 B C. at the age of eighty.

- Apart from his other contributions in the fields of astronomy and geography, he is famous for the correct measurement of the length of equator with the help of an indigenous apparatus known as “gnomon”.
- The book written by Eratosthenes describes the ekumene -the inhabited earth in which he accepted both the major divisions of Europe, Asia and Libya (Africa), and five climatic zones, i.e., a torrid zone, two temperate and two frigid zones.

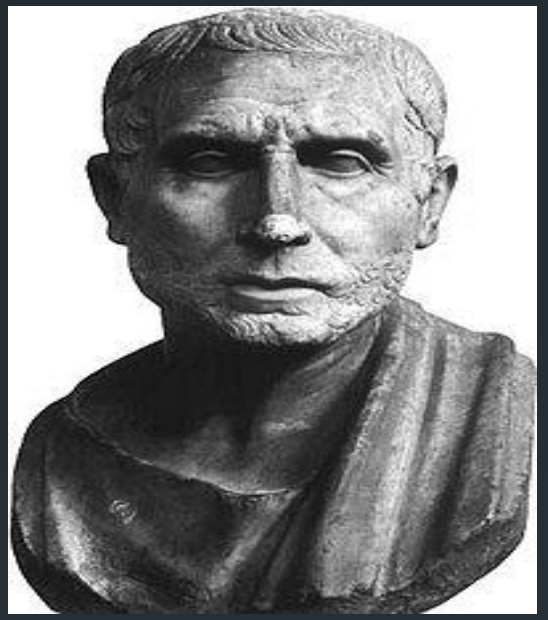
- About the problems of shape, sizes position and spherocity of the earth, Eratosthenes adopted the views of Aristotle and Euclid and regarded the earth as a sphere, placed in the centre of the universe, round which the celestial spheres revolve every twenty-four hours. Further the sun and the moon had independent motions of their own. Thus, his idea of the shape of the earth is in conformity with the modern geographers.
- Eratosthenes tried to *measure the circumference of the earth*. Eratosthenes, therefore, concluded that the whole earth was about *25,000 miles* in circumference (actually the circumference measured through the poles in 24,860 miles)
- The only theoretical error in the measurement of the circumference of the earth was that Eratosthenes took the earth as a perfect sphere instead of oblate spheroid. As such the length of the meridian great circle was taken to be equal to the length of equator, i.e., 25,000 miles, though, in fact, it is only 24,860 miles.

Hipparchus (140 B.C)

Hipparchus was a Greek astronomer and mathematician who discovered the precession of the equinoxes, calculated the length of the year to within six and half minutes.

After the death of Eratosthenes, Hipparchus was appointed as the librarian of Alexandria. His dates of birth and death are not known, but it is certain that he was working at the library in 140 B.C. In his work, he stressed the importance of parallels of latitudes and meridians of longitudes. He made a marked development in the field of scientific cartography.

- For the determination of latitudes and longitudes, Hipparchus invented an instrument known as astrolabe. This apparatus was easier to handle and more accurate than gnomon . Moreover, it was very useful in the open seas where it could be used by hanging on the rigging of a ship. The astrolabe made possible the measurement of latitude at sea by observing the angle of the Polar Star .
- The credit for the conversion of a three dimensional sphere into a two-dimensional plane also goes to Hipparchus. He devised two kinds of projections so that the curved sphere of the earth might be converted into plane surface on sound mathematical principles.



Posidonius

Posidonius was an important Greek historian and geographer who lived shortly before the time of Chris. His two important contribution to Geography are well known : out of which, the one, a wrong idea persisted for centuries and the other a correct idea that was overlooked.

- He calculated the circumference of the earth and arrived at a much smaller figure than that of Eratosthenes. The figure he arrived at for the circumference was 18000 miles only.

- Posidonius, however, was right about another matter. He refused to follow Aristotle in believing that the equatorial part of the torrid zone was uninhabitable because of heat. The highest temperature and the driest deserts, he insisted, were located in the temperate zone near the tropics, and the temperatures near the equator were much less extreme.

Roman Geography:

Much of Greek traditions in Geography were carried forward into ancient roman scholarship. Greek political power passed into their hands. Their armies made advances in different directions, especially in central Europe, France, Britain and Asia minor.

The Romans major contribution was to *historical and regional Geography*. Whereas Polybius and Posidonius contributed to the field of Physical Geography, it was Strabo who compiled the regional and historical geography of the world.

Strabo(64 B.C-A.D 20)

- He was born in Amesia, 50 miles to the south of the Black sea coat in Turkey in about 64 B.C. It was the capital of barbarian kings and had a large Greek population.
- From his writings, it can be ascertained that Strabo got his early education at Nysa under the supervision of Arstodamus who was great grammarian.

- Strabo is considered as the "*father of regional Geography"* because he substituted divisions based on natural boundaries(such as rivers, mountains, etc) for the less permanent and artificially drawn political units. He was the first to declare Geography as a chorological science.
- He is first scholar who conceived the idea of a complete Geographical treatise , *comprising all four branches of the discipline, namely mathematical, political, physical and historical geography.*

- He wrote as many as 43 volumes under the title *Historical memoir*. Moreover, he wrote *17 volumes of his geographical treatise*. His geographical treatise, namely, ***Geographica*** was designed not for Geographers but also for politicians and statesmen.
- The *first two volumes* of it are devoted to an introduction of the subject in which he discuss the aims and objectives of his treatise and fundamental principles.
- In *Second volume*, he examines detail work of Eratosthenes and discuss changes introduced by him in the map of the world.
- The *third volume* gives an account of Europe with stress on the geography of Spain, Gaul and Britain.
- The *fourth volume* is devoted to Gaul, Britain and Alps.
- The *fifth and sixth volumes* are devoted to Italy and Sicily.The major source for this description was from posidonius.
- The *seventh volume* have a brief and general account of the countries extending to the east of Rhine and to the north of Danube.

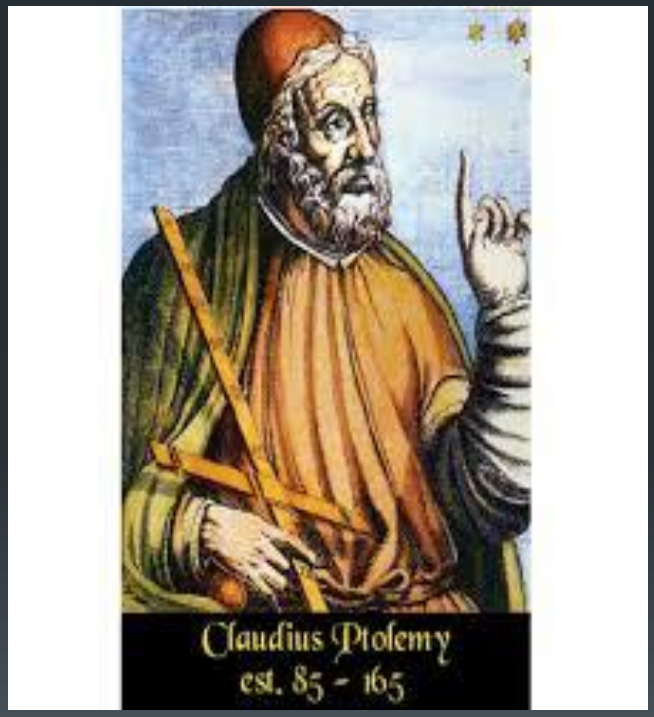
- The *eighth, ninth and tenth volumes* are devoted to Greece and neighboring islands. In this he gives very little information about Physical Geography except inlets and straits.
- Then *eleventh to sixteenth* volumes are devoted to description

  of Asia. In all these books, he relied upon Eratosthenes, especially with reference to the configuration ,drainage and topography.
- The eleventh is devoted to the border land of Asia and Europe. Next three volumes are filled with description about Cappodocia and Pontus and northern province of Asia.
- The mainland of Asia, comprising the nations of Assyria, Persia, Babylonia, Mesopotamia, Syria, Arabia and **India** is discussed in the fifteenth and sixteenth volumes. For India he relied on Nearchus, Aristobulus and also consulted with magasthenes records.

- The *last seventeenth volume* of Strabo's work is devoted to Africa. He described it as a right angled triangle, having at its base of the mediterranean sea coast and shorter side was formed by the Nile through Ethiopia up to the ocean.
- Strabo was only geographer of ancient period who wrote about all branches –*Historical, Physical, Political and Mathematical og Geography.*

Ptolemy(A.D 90-168)

- Claudius Ptolemy was a native of Egypt .He was born at Pelusium.
- He lived and wrote at Alexandria about the middle 2nd century of Christian era.



- His concept of the universe coincided with Aristotle that the Earth was a sphere that remained stationary In the centre while other celestial bodies revolved round it in circular orbits.
- His best known first work is The Almagast . It presents in detail the mathematical theory of the motion of the sun , the moon and planets.
- His second most work *The* Geography, also known as *The guide to Geography* with excellent theory of map projection. It is catalogue of places with their latitudes and longitudes .It also contains map of the world contains Europe, North Africa and most of Asia as well as 26 maps of specific areas.

- The major contributions of him to the field of mathematical Geography can be studied under the sub headings – circumference of the earth, dimensions of the habitable world, prime meridian, graticule and design of projection .
- In art of map making , the great contributions made by Ptolemy lies in the great improvements he made over previously drawn maps. He did by adopting a projection for world map showing the graticule of latitudes and longitudes. He represented the equator and latitudes by parallel curves and meridian by straight lines.
- The world map prepared by him revealed exaggerated size of land hemisphere. It shows no connection between south east Asia and Africa, making the Indian ocean as landlocked sea.
- Among the Greeks and Romans, the period of Ptolemy unquestionably marks the highest to which Geographical science ever reached.

Medieval period

The medieval times, especially in Europe, were a dark period for development of science and geographic ideas. Then the discoveries in that period take a long time getting back to rest of world.

1. In Christian world:

In early period of European scholars could work only with *Latin* and in latter part of this period did few them with *Arabic* language.

Marco polo, make valuable contribution to the Christian world about Asian landmass. His book was thought to be great record of geographic exploration with much information.

Geography in the Christian world appears to have very much relied upon Ptolemy's works and ideas but very little attempts were made by Greek tradition.

2.Muslim geography:

It preferred to formulate their concepts as generalizations of empirically observed facts and insisted on importance of direct observation. It is flourished in city of Baghdad.

- *Ali-Masudi(956):*

He described the evaporation of moisture from water surface and condensation in the clouds and description about effect of environment on mode of life and attitudes of people.

- *Al maqdisi (985):*

He prepared *new climatic map of the world with fourteen climatic regions* and he presented that most of world's land area was in northern hemisphere.

- *Al biruni & Ibn-sina:*

They would be known for their "contribution to Geomorphology" and identified the alluvial deposits south of the Himalayas.

- *Edrisi*:

He made extensive corrections of ideal of Ptolemy and also corrections of course of rivers and shown that Greek division into five climatic zones.

3.Chinese geographer:

Shen kuau, Chinese geographer presented an idea in 1074 about erosion of mountain and considering the reason for these shapes.

The Chinese had a rich tradition in the art of map making which seems to have been inherited by scholars of medieval china. They maintained tradition of expeditions, explorations and voyages.

Conclusion

These discoveries, inventions and revolution in art of map making may be collectively called Renaissance brought about renewed interest in the Geographical knowledge and removed earlier misconceptions.

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