

GEOGRAPHY

MODULE - VII

MODERN TRENDS IN GEOGRAPHY

- ❖ Trends are temporal observations that allow you to study a pattern over time.
- ❖ Geography is the field of science devoted to the study of the lands, features, inhabitants, and phenomena of the Earth and planets.
- ❖ Geography has been called "the world discipline" and "the bridge between the human and the physical sciences".
- ❖ Geographers are increasingly working in the field of environmental conservation, water pollution and monitoring, water conservation, environmental education, sustainability, etc.

TWO BRANCHES OF GEOGRAPHY

- ❖ Geography is divided into two main branches:

Human geography

Physical geography.

- ❖ There are additional branches in geography such as:

Regional geography,

Cartography

Integrated geography.

APPROACHES IN THE STUDY OF GEOGRAPHY

- ❖ Geography has undergone several changes in its approach.
- ❖ The earlier geographers were descriptive geographers.
- ❖ Later, geography came to be developed as an analytical science.
- ❖ Today the discipline is not only concerned with descriptions but also with analysis as well as prediction.
- ❖ There are two distinct approaches or methods to study geography.

❖ They are:

Systematic approach

Regional approach

Systematic Approach:

- ❖ Systematic or nomothetic approach was introduced by Alexander Von Humbolt.
- ❖ A German geographer (1769-1859).
- ❖ A particular phenomenon is considered for detailed understanding.
- ❖ The study of specific natural or human phenomena that gives rise to certain spatial patterns and structures on the earth surface is called systematic study.
- ❖ Generally, systematic geography is divided into four main branches.

FOUR MAIN	BRANCHES OF SYSTEMATIC GEOGRAPHY
Physical Geography	Study of various elements of earth systems like atmosphere (air), hydrosphere (water), lithosphere (rock) and biosphere (life) and their distributions.
Biogeography	Include the environmental geography. It focuses on various kinds of forests, grasslands, distribution of flora and fauna, human-nature relationships, quality of the living environment and its implications for human welfare.
Human Geography	It describes the human culture, population, dynamic socio economic and political aspects.
Geographical methods and techniques	It is concerned with methods and techniques for field studies, qualitative, quantitative and cartographic analysis.

Regional Approach:

- ❖ Other name - idiographic approach.
- ❖ It was developed by Carl Ritter (1779 - 1859).
- ❖ A contemporary of Humbolt.
- ❖ The regions could be classified based on a single factor like relief, rainfall, vegetation, per capita income or there could also be multi-factor regions formed by the association of two or more factors.
- ❖ Administrative units like states, districts and taluks can also be treated as regions.

The <u>main sub branches of regional geography</u> are:
Regional studies
Regional analysis
Regional development
Regional planning

TECHNIQUES IN GEOGRAPHY

- ❖ There are new technologies used in geography.
- ❖ Remote sensing, Geographical Information Systems (GIS), Geocaching, DVD or video, digital photography, and videoconferencing, cartography, geographic visualization, and spatial statistics.

Cartography

- ❖ Cartography studies the representation of the Earth's surface with abstract symbols (map making).
- ❖ Although other subdisciplines of geography rely on maps for presenting their analyses, the actual making of maps is abstract enough to be regarded separately.
- ❖ Cartography has grown from a collection of drafting techniques into an actual science.
- ❖ Cartographers must learn cognitive psychology and ergonomics to understand which symbols convey information about the Earth most

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effectively, and behavioural psychology to induce the readers of their maps to act on the information.

- ❖ They must learn geodesy and fairly advanced mathematics to understand how the shape of the Earth affects the distortion of map symbols projected onto a flat surface for viewing.
- ❖ Cartography is the seed from which the larger field of geography grew.
- ❖ Most geographers will cite a childhood fascination with maps as an early sign they would end up in the field.

Geographic information systems

- ❖ Geographic information systems (GIS) deal with the storage of information about the Earth for automatic retrieval by a computer, in an accurate manner.
- ❖ GIS specialists must understand computer science and database systems.
- ❖ GIS has revolutionized the field of cartography: nearly all map making is now done with the assistance of some form of GIS software.
- ❖ The science of using GIS software and GIS techniques to represent, analyse, and predict spatial relationships is called geographic information science (GIS).
- ❖ Geographic information technology uses computer-based tools to analyse spatial information into a geographic information system.
- ❖ In a geographic information system, data of the real world are stored into a georeferenced database, which can be displayed via maps.

Remote sensing

- ❖ Remote sensing is the science of obtaining information about Earth features from measurements made at a distance.
- ❖ Remotely sensed data comes in many forms.
- ❖ Such as - satellite imagery, aerial photography, and data obtained from hand-held sensors.
- ❖ Geographers increasingly use remotely sensed data to obtain information about the Earth's land surface, ocean, and atmosphere.

- ❖ Reason why the geographers using remote sensing data are:
 - supplies objective information at a variety of spatial scales (local to global)
 - provides a synoptic view of the area of interest
 - allows access to distant and inaccessible sites
 - provides spectral information outside the visible portion of the electromagnetic spectrum
 - facilitates studies of how features/areas change over time.
- ❖ Remotely sensed data may be analysed either independently or in conjunction with other digital data layers.

Quantitative methods

- ❖ Geostatistics deal with quantitative data analysis, specifically the application of statistical methodology to the exploration of geographic phenomena.
- ❖ Geostatistics is used extensively in a variety of fields.
- ❖ Including - hydrology, geology, petroleum exploration, weather analysis, urban planning, logistics, and epidemiology.
- ❖ Applications of geostatistics rely heavily on geographic information systems.
- ❖ Particularly for the interpolation (estimate) of unmeasured points.
- ❖ Geographers are making notable contributions to the method of quantitative techniques.

Qualitative methods

- ❖ Geographic qualitative methods, or ethnographic research techniques, are used by human geographers.
- ❖ In cultural geography - there is a tradition of employing qualitative research techniques, also used in anthropology and sociology.
- ❖ Participant observation and in-depth interviews provide human geographers with qualitative data.

SATELLITE TECHNIQUES

Satellite Maps
Google Maps
Google Earth Pro
NASA Worldview
Esri World Imagery.
map box
Esri Wayback Atlas
Bing Maps
HERE Maps
Planet Explorer
MapQuest
Yahoo! Maps
MDA NaturalVue

Specialty Satellite Maps
Night View
Global Forest Map
NASA's Fire Information for Resource Management System (FIRMS)

Weather Forecasting
NOAA Weather Radar
GOES Viewer
Latest 24

Humanitarian Satellite Maps
Tomnod/GeoHIVE

Digital Globe Open Data

Beyond Visible
Landsat Explorer
Sentinel Playground
USGS Earth Explorer
Leaflet
Cesium

GEOGRAPHERS

- ❖ Greeks were the first people who contributed to the field of geography in the ancient times.
- ❖ Romans carried forward the Greek tradition of contributions to the development of geography.
- ❖ Most of the best geographers were also cartographers.
- ❖ All famous geographers exhibited a curiosity about the world and people around them, and developed new ways of interpreting the things they saw.
- ❖ These people helped in shaping our understanding of how the natural world influences the course of human history.
- ❖ The things like the areas where people tended to settle, to the establishment of trade and cultural exchange, trading routes, to the development of different cultures worldwide.
- ❖ It would be correctly said that the Greek and Roman scholarship laid the base of scientific geography which left its imprints for centuries to come.
- ❖ The impact is so huge that after the death of Ptolemy it left a vacuum in the history of geographical thinking.
- ❖ Herodotus, Anaximander, Hipparchus and Eratosthenes draw the parallels of latitudes also.

- ❖ Geography as a field of knowledge had its roots in the Greek scholarship.

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- ❖ In the ancient Greek scholarship, two traditions of geographical studies are found.
- ❖ They are as follows:
 - The mathematical tradition
 - The literary tradition.

HOMER

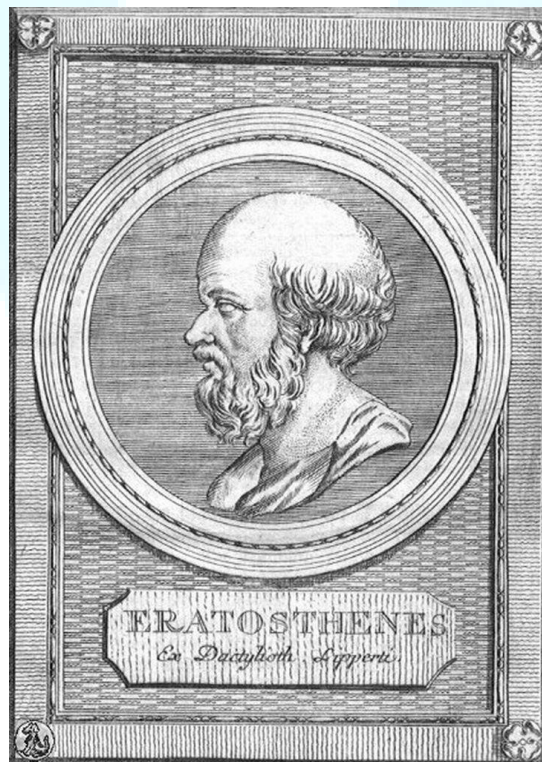
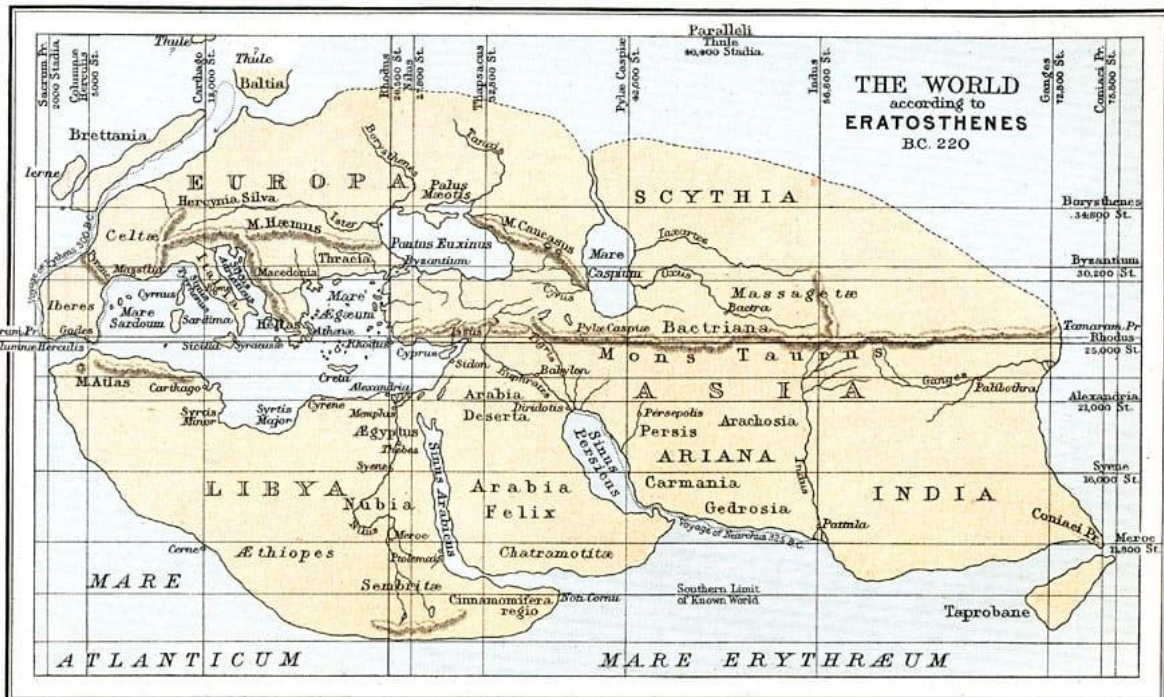
- ❖ It is a common belief that Homer is regarded as the Father of Geography.
- ❖ This is because he introduced the literary tradition through his monumental work 'Odyssey' and 'Illiad'.
- ❖ He described the four winds coming from different directions and named them Boreas (North), Eurus (East), Notus (South) and Zephyrus (West)

ERATOSTHENES

- ❖ Eratosthenes would still be notable as the man who coined geography.
- ❖ Deriving from two words 'ge' meaning 'the earth' and 'graphy' meaning 'to describe'.
- ❖ Eratosthenes, the ancient Greek scholar is called the 'father of geography'.
- ❖ He was the first one to use the word geography.
- ❖ He also had a small-scale notion of the planet that helped him to determine the circumference of the earth.
- ❖ Calculated the size of the Earth.
- ❖ He is credited to provide the definition of geography as the "study of earth as the home of man".
- ❖ An outstanding contribution for which he is known throughout the world is his measurement of the earth's circumference.
- ❖ He has also prepared a world map with respect to correct distance.
- ❖ His remarkable contribution was his text 'Geographica'.
- ❖ He also delineated the world into five climatic zones: one Torrid Zone, two temperate zones, and two frigid zones.

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- ❖ He also measured different latitudes and longitudes.
- ❖ Another reason that Eratosthenes is considered as the father of "Geodesy".



ANAXIMANDER

- ❖ Anaximander is credited with the introduction of a Babylonian instrument known as Gnomon into the Greek literary world.

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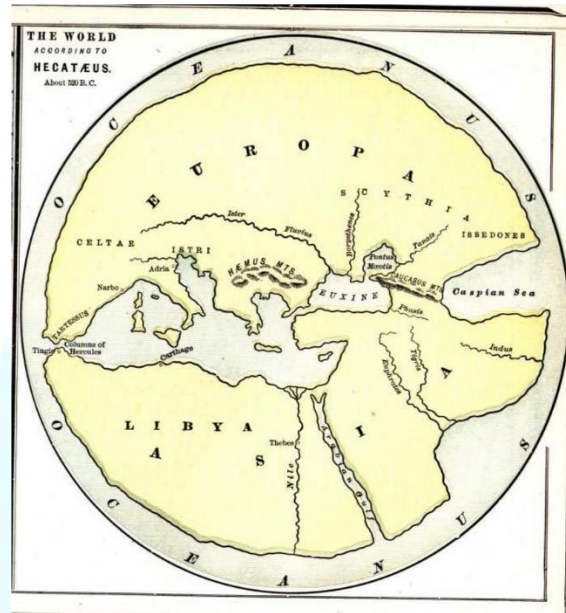
- ❖ Gnomon is a pole set vertically above a flat surface on which the varying position of the sun and other celestial bodies could be measured by the length and direction of the shadow cast by the vertical pole.
- ❖ He is even credited to produce a world map to scale.
- ❖ This map is based on the information gathered from the Sumerians who had an archive of pictorial maps.
- ❖ Interestingly, this map has an ocean encircling the world.
- ❖ Thales and Anaximander are credited for the initiation of mathematical tradition in geography.

HECATEAUS

- ❖ The credit for originating the literary tradition goes to Hecateaus.
- ❖ He was a Greek scholar of 6th century BC from Miletus (the center of learning in those days).
- ❖ A pioneer scholar and one of the earliest writers of Greek prose.
- ❖ He was the first Greek scholar to classify the information about the then known world and brought it to Miletus.
- ❖ His work is known as "Ges-periodos" or Description of the Earth.
- ❖ It was the first systematic description of the then known world, that was published by the end of 6th century BC.
- ❖ Ges-periodos describes the places in the vicinity of the Mediterranean Sea which was called as periplus means coastal area.
- ❖ Hecateaus divided his book "Ges-periodos" into two parts, part 'A' dealing with geographical information about Europe' and part B dealing with Libya.
- ❖ This book is a blend of the literary tradition and the topographical-ecological tradition.
- ❖ Hecataeus for the first time gave two approaches for the study of geography:
 - Nomothetic or law seeking approach.
 - Idiographic approach (descriptive).

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- ❖ Hecataeus prepared the world map but it was based on the map of Anaximander; he had just modified it.
- ❖ He divided it into two parts by drawing a line passing through Hellespont, the Caspian Sea and Caucasus mountains.
- ❖ The northern part he named as Europa and southern part of Libya that includes Africa and Asia.



ARISTOTLE

- ❖ Aristotle agreed with Plato that the earth is spherical in shape and went a step further by seeking an explanation for the spherical shape.
- ❖ He even contributed to the branch of human geography.
- ❖ He put forward the concept of variations in habitability on the surface of the earth on the basis of latitudinal position.
- ❖ He opined that the regions nearer to the Equator were uninhabitable and named it as the Torrid Zone.
- ❖ Similarly, the parts of the earth which was away from the Equator and were permanently frozen were also uninhabitable - the Frigid Zone.
- ❖ The population of the Earth lived in the Temperate zone which existed between the Torrid and the Frigid Zones.

HIPPOCRATES

- ❖ Hippocrates in his book 'On Airs, Waters, Places' explained the man-nature relationship in the context of climatic conditions.
- ❖ Hipparchus established the concept of locating the exact position of each place on the surface of the earth.

POSIDONIUS

- ❖ Posidonius recalculated the earth's circumference and came to a figure much smaller than that of Eratosthenes (approximately 18000 miles).

PLATO

- ❖ Plato is regarded as the master of deductive reasoning - from the general to the particular.
- ❖ He is considered to be the first scholar who adopted the idea of round earth located in the center of the universe with the other celestial bodies revolving around it in a circular motion.

STRABO

- ❖ Strabo (64/63 BC - c. AD 24).
- ❖ Wrote Geographica.
- ❖ One of the first books outlining the study of geography.
- ❖ A Greek scholar, and traveller who was highly influenced by the historical and topographical tradition of former Greek scholars especially Homer, Hecateus and Aristotle.
- ❖ He was in acceptance of Aristotle's zones of habitable world.
- ❖ His biggest contribution is his monumental work 'Geographia' in seventeen volumes; a compilation of writings of his predecessors.
- ❖ Out of these seventeen books - eight are in Europe, six on Asia and one of Africa (Egypt and Ethiopia).

- ❖ The first two books were devoted to the historical review of the development of geography from the times of Homer.

PTOLEMY

- ❖ Roman geographer.
- ❖ Ptolemy - compiled Greek and Roman knowledge into the book 'Geographia'.
- ❖ The geographical scholarship in the ancient period is incomplete without the advancements made in the Roman Empire.
- ❖ Although Romans did not contribute at such a large scale that it can be compared to the contributions of the Greeks, the writings and the contribution of Ptolemy cannot be overlooked.
- ❖ He revived the mathematical tradition of Thales which was long forgotten.
- ❖ Geography was a science of the art of map-making.
- ❖ This concept was borrowed from the works of earlier Greeks especially Aristotle, Hipparchus, Posidonius and Marinus the Tyre (his teacher).
- ❖ He came up with a monumental work known as "The Almagest".
- ❖ The standard reference for the study of the movement of celestial bodies for a long time.
- ❖ He even accepted Aristotle's view that the earth was spherical in shape, centered in the universe and remained stationary; the celestial bodies revolving around it in a circular motion.
- ❖ Another significant contribution of Ptolemy was in the field of map making.
- ❖ He improved and modified previous maps by adopting a projection for the world map which had a graticule of meridians of longitude and parallels of latitudes.
- ❖ He wrote the book - Guide to Geography.
- ❖ Which consisted of eight volumes.
- ❖ In the first volume, he discusses the map projections.
- ❖ In the volumes two to seven, he provides a table of latitudes and longitudes.
- ❖ So that every place can be given a precise location in mathematical terms.

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- ❖ He accepted the idea that the regions near the Equator were uninhabitable because of higher temperatures.

AL IDRISI

- ❖ The 12th century geographer and cartographer.
- ❖ Abu Abd Allah Muhammad al-Idrisi al-Qurtubi al-Hasani al-Sabti, also called Al Idrisi, or Dreses.
- ❖ 1100 - 1165.
- ❖ Famous for being a cartographer as he is for a geographer.
- ❖ A pre-Renaissance man.
- ❖ The 'Tabula Rogeriana' is his most famous work of geography and cartography and was created for King Roger II of Sicily.
- ❖ Al Idrisi didn't just create the map of Eurasia and north Africa found in the Tabula Rogerian.
- ❖ He also wrote an extremely detailed account of all of the geographical features, ethnic groups, socioeconomic factors, and other features of every area he drew.
- ❖ He had visited Spain, Portugal, France, Anatolia, and England by age sixteen, and travelled even more extensively later in life.
- ❖ Author of Nuzhatul Mushtaq.



ALEXANDER VON HUMBOLT

- ❖ The foundation for the science of biogeography.

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- ❖ He was the first person to develop the idea that weather patterns, geology, and biology all played a part in determining which plants were capable of thriving in which areas.
- ❖ Collected geographical and biological data over a period of years, and carefully traced the relationships he found between them.
- ❖ The end result was the publication of 'Cosmos / Kosmos', a multi-volume work that covered the aspects of geography and natural science that he devoted his life.

IMMANUEL KANT

- ❖ Kant is known more for being an 18th century philosopher than a geographer.
- ❖ His work is the large part of the reason why - geography is treated as a legitimate science today.
- ❖ Believed that geography classified things according to place, while history classified things according to time.
- ❖ As a result, according to Kant, geography had an important place in virtually every facet of knowledge.
- ❖ In 1757, Immanuel Kant became the first to specifically teach geography as its own subject while at the University of Königsberg.
- ❖ By establishing the academic importance of geography, he lent more legitimacy to geography as an intellectual discipline.
- ❖ Kant did not set forth a paradigm for geography.
- ❖ Thus, he was not the founder of a school of geography, but clarified the role of the subject and its position in relation to other contemporary sciences.

CARL RITTER

- ❖ Ritter is one of the most important figures in modern.
- ❖ August 7, 1779 - September 28, 1859.
- ❖ Ritter treated the various geographical features of the world like organs in the human body.

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- ❖ He believed that each one interacted with the others to create a cohesive whole.
- ❖ Occupied the first chair of geography at Berlin University.
- ❖ He wrote the 19-volume 'Geography in Relation to Nature and the History of Mankind'.
- ❖ Along with Kant, was instrumental in establishing geography as a field of study.

ARNOLDO FAUSTINI

- ❖ Arnaldo Faustini is the man for whom the Faustini moon crater is named.
- ❖ He was a geographer, writer, and cartographer.
- ❖ Born in 1872 lived until 1944.
- ❖ He specialized in the poles.
- ❖ Wrote nineteen different books on subjects having to do with the poles alone.

WILLIAM MORRIS DAVIS

- ❖ 1850-1934.
- ❖ Father of American geography.
- ❖ Developer of the cycle of erosion.

OTHER GEOGRAPHERS ARE:

- ❖ Gerardus Mercator
- ❖ Arnold Henry Guyot
The structure of glaciers and advanced understanding in glacier motion, especially in fast ice flow.
- ❖ Carl O. Sauer
Cultural geographer.
- ❖ Edward Soja
Worked on regional development, planning and governance
Coined the terms Synekism and Postmetropolis

Winner of the Vautrin Lud Prize.

❖ Ellen Churchill Semple

First female president of the Association of American Geographers.

❖ Ernest Burgess

Creator of the concentric zone model.

❖ Gerardus Mercator

Cartographer who produced the Mercator projection.

❖ John Francon Williams

Author of the book '*The Geography of the Oceans*'.

❖ Michael Frank Goodchild

GIS scholar

Winner of the RGS founder's medal in 2003.

❖ Paul Vidal de La Blache

Founder of the French school of geopolitics

Wrote the principles of human geography.

❖ Radhanath Sikdar

Calculated the height of Mount Everest.

❖ Walter Christaller

Human geographer

Inventor of Central place theory.

❖ Yi-Fu Tuan

Chinese-American scholar

Credited with starting Humanistic Geography as a discipline.

❖ Karl Butzer

German-American geographer

Cultural ecologist

Environmental archaeologist.

❖ David Harvey

Marxist geographer

Author of theories on spatial and urban geography

Winner of the Vautrin Lud Prize.