GEOGRAPHICAL SELECTIONS

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Contents

Subject		Page No
Introduction	What Is Geography?	5-20
First	Human Geography	21-22
Chapter1	Historical Geography	23-28
Chapter 2	Population Geography	29-38
Chapter 3	Geography of Settlements	39-46
Chapter 4	Economic Geography	47-56
Chapter 5	Political Geography	57-72
Chapter 6	Geography of Travel & Tourism	73-80
Chapter 7	Medical Geography	81-88
Scand	Physical Geography	89–92
Chapter 1	Lithosphere	93-108
Chapter 2	Sudden changes in the earth's crust	109-120
Chapter 3	The Rocks	121-128
Chapter 4	Atmosphere	129-140
Chapter 5	Climates of the world	141-156
Third	The largest river basins in the world	157-192

Introduction

What Is Geography?

Geography is the study of the Earth's physical features and environment including the impact of human activity on these factors and vice versa. The subject also encompasses the study of patterns of human population distribution, land ”use, resource availability, and industries

Scholars who study geography are known as geographers. These people engage themselves in the exciting task of exploring and studying the Earth's natural environment and human society. Although map-makers were known as geographers in the ancient world, today, they are more specifically known as cartographers. Geographers usually focus on two major fields of geographical studies: physical .geography or human geography

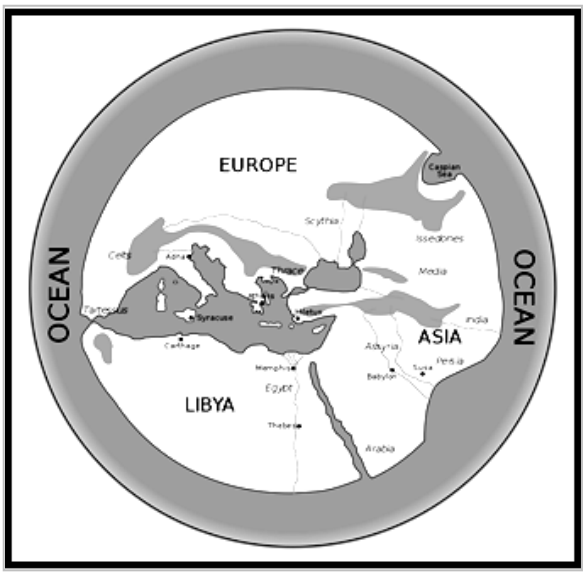
History of Geography:

The term geography was coined by the ancient Greeks who not only created detailed maps and accounts of places around them but also illuminated why and how human and natural patterns varied from one place to another on Earth.

Through the passage of time, the rich legacy of geography made a momentous journey to the bright Islamic minds.

The Islamic Golden Age witnessed astounding

van cements in the geographical sciences. Islamic geographers were credited with groundbreaking discoveries.



(Reconstruction of the map of Hecataeus of Miletus)

New lands were explored and the world's first grid-based mapping system was developed.

The Chinese civilization also contributed instrumentally towards the development of early geography. The compass, a traveling aid, devised by the Chinese, was used by the Chinese explorers to explore the unknown

A new historical chapter of geography opened during the "Age of Discovery", a period coinciding with the European

Renaissance. A fresh interest in geography was regenerated in the European world.

Marco Polo, the Venetian merchant traveler, spearheaded this new Age of Exploration Commercial interests in establishing trade contacts with the rich civilizations of Asia like China and India became the primary reason for traveling during this period.

Europeans moved ahead in all directions, discovering new lands, unique cultures, and natural wonders in the process. They also began to colonize new lands towards the latter half of the Age of Exploration.

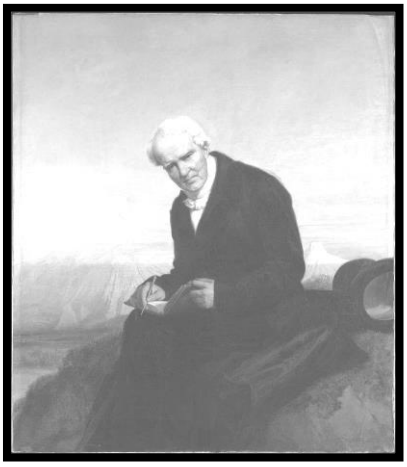
The tremendous potential of geography to shape the future of human civilization was recognized and in the 18th Century, geography was introduced as a discipline of study at the university level.

Based on geographical knowledge, the human society discovered new ways and means to overcome the challenges posed by nature and human civilizations flourished in all parts of the world. In the 20th century, aerial photography, satellite technology, computerized systems, and sophisticated software radically changed the definition of geography and made the study of geography more comprehensive and detailed

The Branches of Geography:

Geography can be regarded as an interdisciplinary science. The subject encompasses an interdisciplinary perspective that allows the observation and analysis of

(Alexander von Humboldt)) (1769 – 1859)



anything distributed in Earth space and the development of solutions to problems based on such analysis.

The discipline of geography can be divided into several branches of study. The primary classification of geography divides the approach to the subject into the two broad categories of physical geography and human geography

Human Geography:

Human geography is the branch of geography that deals with the study of how the human society is influenced by the Earth's surface and environment and how, in turn, anthropological activities impact the planet.

Human geography is centered on the study of the planet's most evolved creatures: the humans and their environment

This branch of geography can be further subdivided into various disciplines based on the focus of study

Population Geography:

A division of human geography, population geography deals with the study of how the nature of a place determines the distribution, growth, composition, and migration of human populations

Historical Geography:

Historical geography elucidates the ways in which geographical phenomena change and evolve with time. Though it is treated as a sub-field of human geography, it also focuses on certain aspects of physical geography. Historical geography attempts to understand why, how and when a place or region on Earth changes and the impact such changes have on the human society

Cultural Geography:

Cultural geography explores how and why cultural products and norms vary with space and place. It thus deals with the study of the spatial variations of human cultures including religion, language, livelihood choices, politics, etc. Religion geography, language geography, etc., are some of the subfields of cultural geography

.

Economic Geography:

A vital aspect of human geography, economic geography encompasses the study of how human economic activities are located, distributed and organized in geographical place and space. Marketing and transportation geography can be treated as sub-fields of economic geography

Political Geography:

This important field of human geography deals with the political boundaries of the countries of the world and the division of land and its resources between the countries. It also deals with how spatial structures influence political functions and vice versa. Military geography, electoral geography, geopolitics are some of the subfields of political geography

Health Geography:

A sub-discipline of human geography, health geography concentrates on the influence of the geographical location and place on the health and well-being of humans. It tends to approach the subject of human health from a comprehensive perspective encompassing the influence of society and space on health and disease

-Medical Geography :

Medical Geography does not have particularly strong links with 'medicine', as normally understood (i.e. the

treatment of people who are ill) so many medical geographers now prefer to refer to their subject as the Geography of Health and Health Care' and to themselves as 'health geographers'. However, I am not convinced that such formulations represent an improvement.

Developmental Geography:

This branch of human geography explores the quality of life and the standard of living of the human inhabitants of the world and attempts to

Settlement Geography:

Settlement geography attempts to explore the part of the Earth's surface that encompasses human settlements. It is a study of the urban and rural settlements, the economic structure, infrastructure, etc., and the dynamics of human settlement patterns in relation to space and time

Animal Geography:

Animal geography might be considered as a sub-field of human geography which is closely related to the environmental geography branch of physical geography. It encompasses the study of the life worlds of the animals on Earth and the interdependencies between humans and other animals.

understand how and why such standards vary with place and space

Geography of Travel & Tourism:

A term to cover travel to places away from one's home environment undertaken principally for leisure but also for business.

Tourist activities generally involve spending money in a new location and do not involve remuneration from within the place or country visited. Definitions of tourism by international organizations such as the World Tourist Organization recognize anyone who spends at least one night but no longer than one year somewhere other than their country of residence as a tourist.

Physical Geography:

Physical geography is defined as the branch of geography that encompasses the study of the natural features and phenomena (or processes) on the Earth

Physical geography may be further subdivided into various :branches

Geomorphology:

This involves the study of the topographic and bathymetric features on Earth. The science helps to elucidate various aspects related to the landforms on the Earth such as their history and dynamics. Geomorphology also attempts to predict the future changes in the Earth's physical features

Glaciology:

This field of physical geography deals with the study of the inter-dynamics of glaciers and their effects on the planet's environment. Thus, glaciology involves the study of the cry sphere including the alpine glaciers and the continental glaciers. Glacial geology, snow hydrology, etc., are some of the sub-fields of glaciological studies

Oceanography:

Since oceans hold 96.5% of the Earth's waters, a special field of oceanography needs to be dedicated to the study of oceans. The science of oceanography includes geological oceanography (study of the geological aspects of the ocean floor, its mountains, volcanoes, etc.), biological oceanography (study of the marine life and ocean ecosystems), chemical oceanography (study of the chemical composition of the marine waters and their effects on marine life forms), physical oceanography (study of the oceanic movements like the waves, currents, etc

Hydrology:

This is another vital aspect of physical geography. Hydrology deals with the study of the properties of the Earth's water resources and the movement dynamics of water in relation to land. The field encompasses the study

of the rivers, lakes, glaciers, and underground aquifers on the planet.

It studies the continuous movement of water from one source to another on, above, and below the Earth's surface, in the form of the hydrological cycle

Pedology:

A branch of soil science, pedology involves the study of the different soil types in their natural environment on the surface of the Earth. This field of study helps gather information and knowledge on the process of soil formation (pedogenesis), soil constitution, soil texture, classification, etc

Biogeography:

An indispensable field of physical geography, biogeography is the study of how species on Earth are dispersed in geographic space. It also deals with the distribution of species over geological time periods. Each geographical area has its own unique ecosystem and biogeography explores and explains such ecosystems in relation to physical geographical features. Different branches of biogeography exist like zoogeography (geographic distribution of animals), phytogeography (geographic distribution of plants), insular biogeography (the study of factors influencing isolated ecosystems), etc

Paleogeography:

This branch of physical geography examines the geographical features at various time points in the Earth's geological history. It helps the geographers to attain knowledge about the continental positions and plate tectonics determined by studying pale magnetism and fossil records

Climatology:

The scientific study of climate, climatology is a crucial field of geographical studies in today's world. It examines all aspects related to the micro or local climates of places and also the macro or global climate. It also involves an examination of the impact of human society on climate and vice versa

Meteorology:

This field of physical geography is concerned with the study of the weather patterns of a place and the atmospheric processes and phenomena that influence the weather

Environmental Geography:

Also known as integrative geography, this field of physical geography explores the interactions between humans (individuals or society) and their natural environment from the spatial point of view. Environmental geography is thus the bridging gap between human geography and physical

geography and can be treated as an amalgamation of multiple fields of physical geography and human geography

Coastal geography :

specialization of physical geography that also involves a study of human geography.

It deals with the study of the dynamic interface between the coastal land and the sea. The physical processes that shape the coastal landscape and the influence of the sea in triggering landscape modifications is incorporated in the study of coastal geography.

The study also involves an understanding of the ways the human inhabitants of coastal areas influence the coastal landforms and ecosystems

Quaternary science:

This is a highly specialized field of physical geography that deals with the study of the Quaternary period on Earth (the Earth's geographical history encompassing the last 2.6 million years).

It allows the geographers to learn about the environmental changes undergone in the planet's recent past. This knowledge is then used as a tool to predict future changes in the Earth's environment

Geomatics:

Geomatics is a technical branch of physical geography that involves the collection of data related to the earth's surface, analysis of the data, its interpretation, and storage.

Geodesy, remote sensing, and geographical information science are the three sub-divisions of geomatics

Landscape ecology: The science of landscape ecology deals with the study of how the varying landscapes on Earth influences the ecological processes and ecosystems on the planet. The German geographer Carl Troll is .credited as the founder of this field of physical geography

Integrated geography:

Integrated geography is the branch of geography that describes the spatial aspects of interactions between humans and the natural world.

It requires an understanding of the traditional aspects of physical and human geography, as well as the ways in which human societies conceptualize the environment.

Integrated geography has emerged as a bridge between human and physical geography as a result of the increasing specialization of the two sub-fields.

Furthermore, as human relationship with the environment has changed as a result of globalization and technological

change a new approach was needed to understand the changing and dynamic relationship.

Examples of areas of research in environmental geography include emergency management, environmental management, sustainability, and political ecology.

First
Human Geography

Human Geography : is the branch of geography that deals with the study of how the human society is influenced by the Earth's surface and environment and how, in turn, anthropological activities impact the planet.

Human geography is centered on the study of the planet's most evolved creatures: the humans and their environment

Human Geography**:** focuses on spaces and places. This encompasses spatial structures and patterns of social interaction, as visible in the architectural structures of cities or in the spatial organization of economic areas. But it also includes spaces in our minds, geographical imaginations and the symbolic character of places. The interactions between regions (e.g. the worldwide economic networks, the global networks of knowledge etc.) as well as the interdependencies between different spatial levels (global – national – regional – local) are particularly relevant for geographers. Human Geography is the science of the spatial organization of human action and the relationships between society and environment .

This branch of geography can be further subdivided into various disciplines based on the focus of study

Chapter 1
Historical Geography

Historical Geography is the branch of geography that studies the ways in which geographic phenomena have changed over time. It is a synthesizing discipline which shares both topical and methodological similarities with history, anthropology, ecology, geology, environmental studies, literary studies, and other fields.

Although the majority of work in historical geography is considered human geography, the field also encompasses studies of geographic change which are not primarily anthropogenic. Historical geography is often a major component of school and university curricula in geography and social studies. Current research in historical geography is being performed by scholars in more than forty countries

Historical geography, geographic study of a place or region at a specific time or period in the past, or the study of geographic change in a place or region over a period of time. The writings of Herodotus in the 5th century bce,

particularly his discussion of how the Nile River delta formed, probably provide the earliest example of what would be called historical geography today. Historical geography, as the study of past geographies, remained a relatively undeveloped field of study until the 17th century, when Philipp Clüver,

considered the founder of historical geography, published a historical geography of Germany, combining knowledge of the classics with knowledge of the land

In the 19th century the importance of geography as the basis for understanding history was taught in many universities, particularly in Great Britain. Geography as the basis for understanding history changed to the geographic influence upon historical events in the early 20th century. The work of Ellen Churchill Sample used this environmental deterministic interpretation of history.

From the 1930s, historical geography gained prominence through the valuable studies in sequent occupancy—i.e., the study of the human occupation of a specific region

over intervals of historic time—initiated by Derwent S. Whittlesey and Carl O. Sauer. The establishment of the Journal of Historical Geography (1975) and historical-geography research groups by the Institute of British Geographers (1973) and the Association of American Geographers (1979) served to vindicate the historical approach in geography.

has retained its identity and distinction, although historical geographers have not distanced themselves from changes elsewhere in the discipline, with which their focus on interpreting the past from available evidence resonates. The developments in locational analysis stimulated some new ways to study available data.

For others, the later developments, especially in cultural geography, coincided with their deployment of a wide range of nonquantitative sources to reconstruct the real and imagined, as well as the abstract (spatial analysis), worlds of the past; issues of post colonialism have attracted the attention of historical geographers as well as

those interested in current cultural issues. Detailed analyses of particular places and times are complemented by major syntheses—such as Donald Meinig's four-volume The Shaping of America: A Geographical Perspective on 500 Years of History (1986–2002)

A great range of sources is now used in such endeavors, not only maps but also, for example, travelers' writings about worlds they have encountered. Within this enterprise is a rejuvenated interest in the history of geography itself, not merely as a means of better appreciating where the discipline has come from but also of illustrating the importance of place and context in its evolution; geography, like so much else, is a range of practices that emerged and evolved in response to local stimuli. Geographers have produced particular forms of knowledge that have been significantly influenced by how people have encountered the world.

Chapter 2
Population Geography

The geographical study of population, including its spatial distribution, dynamics, and movement. As a sub discipline, it has taken at least three distinct but related forms, the most recent of which appears increasingly integrated with human geography in general.

The earliest and most enduring form of population geography emerged from the 1950s onwards, as part of spatial science.

Pioneered by Glenn Trewartha, Wilbur Zelinsky, William A. V. Clark, and others in the USA, as well as Jacqueline Beujeau-Garnier and Pierre George in France, it focused on the systematic study of the distribution of population as a whole and the spatial variation in population characteristics such as fertility and mortality.

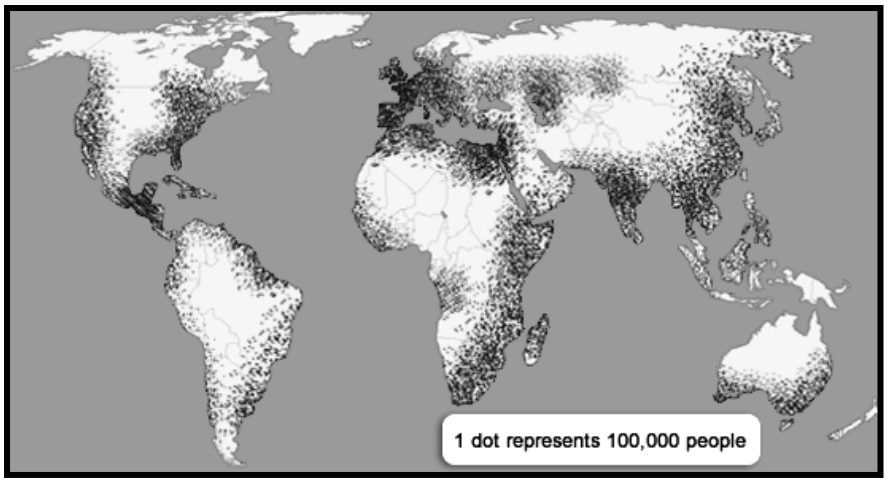
Given the rapidly growing global population as well as the baby boom in affluent countries such as the USA, these geographers studied the relation between demographic growth and resources at an international scale, and population redistribution nationally (see demographic transition).

An exemplary contribution might be Zelinksy's mobility transition model (1971) linking migration and demographic change.

They used secondary data sources such as censuses to map and describe population change and variation, including such trends as counter-urbanization.

Such work could often be distinguished from population studies in general by its use of smaller scale data, below national level. Population projections at national and regional scales could be used to inform public policy debates on resource allocation.

The increasing availability of more sophisticated spatial data, including more flexible census geographies, inter-censual surveys, and more detailed cross-tabulations such as the US Public-Use Micro data Samples encouraged



more advanced modeling, simulation, and projection techniques.

This broad population geography has always been international and therefore comparative in scope, particularly under the auspices of the IGU Commission on Population Geography.

To some extent, however, progress in the Global South has been held back by the poor availability of high-quality spatial data (Hugo 2006). Regular international conferences in population geography began in 2002

A second variant of population geography is narrower in focus, akin to spatial demography.

Geographers working in this field stressed the importance of keeping close to demography, its theories and methods, and therefore concentrating more on the core demographic variables of fertility, mortality, and, to a lesser extent, migration.

They applied mathematical techniques to describe, infer, and also explain population patterns past and present.

A volume edited by British geographers Bob Woods and Phil Rees (1986) Population Structures and Models:

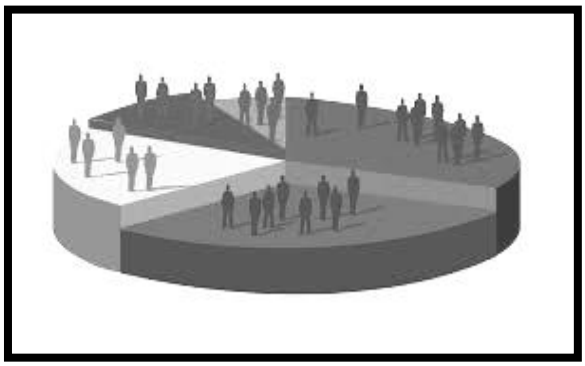
Developments in spatial demography typifies this approach.

Woods' own specialism was the historical demography of infant mortality in Victorian Britain.

Spatial demography has a strong historical component, not least among French and British geographers.

By detailing the spatial (and temporal) variation in mortality, fertility, nuptuality, etc., geographers were able to disrupt many of the generalizations of population change and identify the significance of place.

Many population geographers from the 1980s onwards expressed anxiety that they were marginalized from mainstream human geography and its embrace of social theories from Marxism



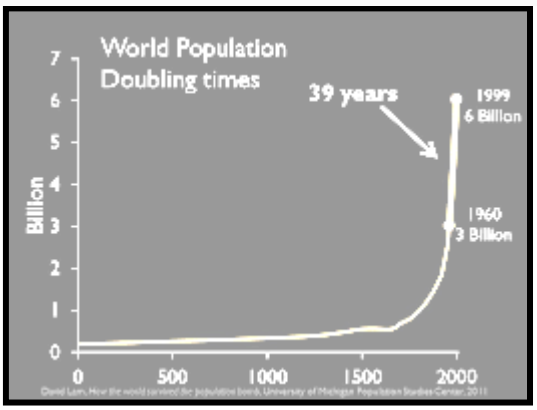
to feminism, and postmodernism (Findlay and Graham 1991).

Not enough research was being done on key issues such as famine, gender, and environment. They also sensed

that other human geographers were overlooking the significance of population to wider processes

A ‘retheorization’ of population geography (White and Jackson) gradually took shape, involving more methodological diversity and theoretical plurality.

New methods, such as life course analysis, helped integrate biographical and individual-level studies into the field. In recent years there has been greater attention paid to gender, religion, age, disability, generation, sexuality, and race, variables which go beyond the vital statistics of births, deaths, and marriages.



Furthermore, population geographers have begun to critique the standard census categories of the field, recognizing the social construction of childhood, whiteness, femininity, etc.

Representative of this more theoretical approach is James Tyner’s (2009) War, Violence and Population: making the body count. Tyner argues that population geography should pay more attention to war and violence, using

examples from the Vietnam War, Cambodia's killing fields, and the Rwandan genocide.

Grounded in post-colonialism and post-structuralism, he deploys Foucault's concepts of biopower and disciplinary power to uncover the logics behind such violence

This more recent form of population geography is increasingly aligned with human geography as a whole. One consequence has been the relative neglect of studies of fertility, mortality, and morbidity, the latter becoming the preserve of medical geography.

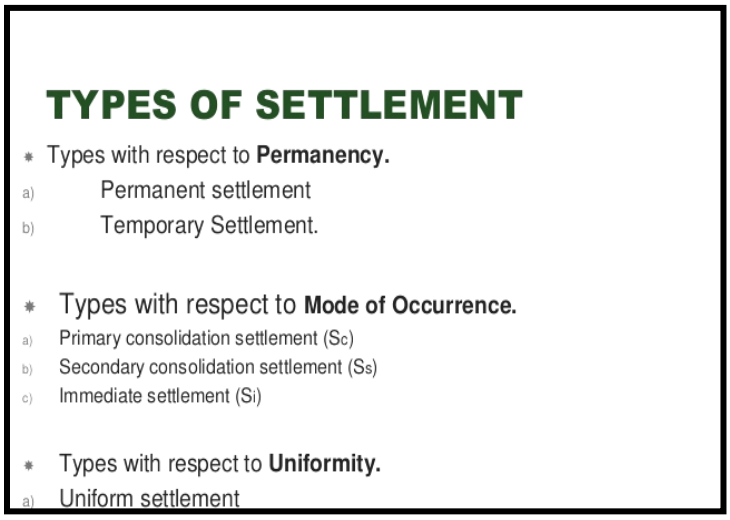
Of the core demographic topics, migration continued to be the most central to population geographers; most of the papers in the main population geography journals, Population, Space and Place (launched in 1995 as The International Journal of Population Geography) and Espace, Populations, Sociétés (founded 1983), concern migration and related topics such as transnationalism

All three forms of population geography outlined here continue side by side. Spatial and historical demography is making increasing use of data sources from outside Europe. Popular textbooks such as Population Geography: Problems, Concept and Prospects (Peters and Larkin 2010) teach new generations the basics of the subject.

By contrast, Adrian Bailey's (2005) Making Population Geography presents a broader, more theoretically informed perspective. Recent conferences and journal special issues have focused on climate change, Neo-Malthusianism, children's geographies, vulnerability, and difference, although migration continues to predominate.

Chapter 3
Geography of Settlements

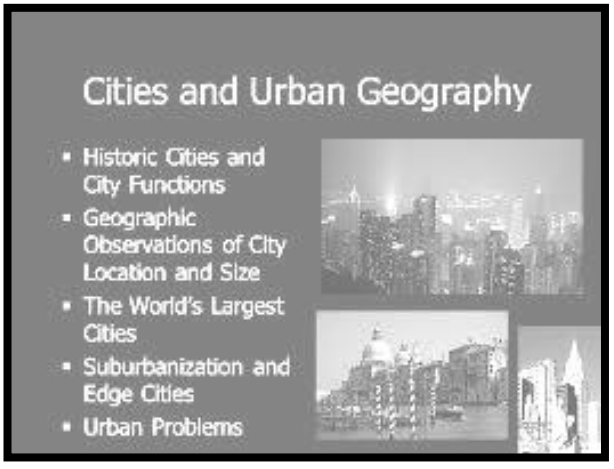
A settlement is a place where people live. They are all different sizes :hamlets are tiny settlements - they are just a collection of houses, perhaps centered around a few farms and maybe without even a shop ;villages are small settlements - several hundred people live in them and they have: a few shops, a place of worship and maybe a school too ;towns are medium-sized settlements - thousands of people live in them and they have a shopping Centre and factories cities are large settlements - they usually have lots of amenities and sometimes a cathedral too (megacities have over 10 million people living in them) Inner Manchester



Rural areas are places in the countryside with few buildings; urban areas are settlements with lots of buildings in them

Transport links, services and entertainment facilities are better in urban areas because more people live in them Different settlements are important for different things and each has a special function

a holiday resort has lots of attractions and shops for tourists to visit and relax in Blackpoll tower from central pier Ferris wheel a market town has a regular market for local farmers a port has a harbor for ships to dock at to collect and deliver cargo to sell their produce at an industrial town has lots of factories and businesses in it Urban Geography



The study of cities and city life from a geographical perspective (see city). Although urban geography is one of the most popular and productive parts of human geography, a precise delineation of the field is understandably difficult.

Attempts to find the essential characteristics of urban places or urban life, for example, by contrast with the rural and rural life, have proved inconclusive (see rurality; urbanism). In much of the world, the distinction between urban and non-urban is blurred or meaningless, as those characteristics once associated with cities such as waged labor, electricity, or the preponderance of secondary relations (i.e. with strangers) become more widespread. In one sense, therefore, the vast majority of human geographical work may be described as urban by default. Considering urban settlements in historical perspective also complicates the search for essential urban qualities. Furthermore, the geographical study of urban life is informed by and contributes to studies in allied disciplines; one of the main journals in the field is simply called Urban Studies. A final complication is that the city as a spatial form can be regarded as both the cause and the consequence of social relations.

From one perspective, exemplified by the Chicago School of urban ecology, cities shaped social effects among their inhabitants. By contrast, many Marxist-inspired geographers in the 1970s thought of cities as the projection of less visible economic processes; inquiry should focus on the processes rather than the outcome. In this regard, David Harvey's contributions have been critical in pointing a way forward.

Despite some ambivalence about the term 'urban geography', over the past sixty years urban geographers have developed some distinct and ongoing themes (Hall and Barrett 2012). Perhaps the most important has been the study of the internal social and spatial structure of cities, in part inspired by ideas from the Chicago School.

Urban morphology considers the spatial layout and appearance of cities in different historical and national

contexts. It can be extended by typologies of different kinds of urban area, for example, edge city, exurb, or suburb. Most focus has been on the social differentiation of urban areas by class, age, race, gender, and sexuality, as well as its causes and consequences (see community; gentrification; segregation; social area analysis; social geography). A second long-standing theme considers cities as systems or networks, linked by flows of people, goods, money, and information (see Central Place Theory; urban system; World City Network).

The third area of inquiry has considered the diversity of cities in historical and international contexts, again frequently through typologies (see industrial city; pre-industrial city; post-industrial city). Here, an important development in the past two decades has been the recognition that normative models or ideas derived from a narrow set of mainly Western cities are not universal region).

Chapter 4
Economic Geography

A sub discipline of geography that seeks to describe and explain the absolute and relative location of economic activities, and the flows of information, raw materials, goods, and people that connect otherwise separate local, regional, and national economies.

It originated in the late 19th century but, unlike its academic cousin, economics, did not initially favor theory. In the form of commercial geography, it tended to be highly empirical, attending to the relations between a location's natural and human resource base and the character of its economy.

The geography of the production of specific commodities was thus based on observation, not deductions from first economic principles. However, this changed from the mid-1950s. Economic geography was, along with urban geography, at the leading edge of the Quantitative and Scientific Revolution in Anglophone human geography. Partly inspired by the earlier research of Alfred Weber and Walter Christaller, a new generation of economic geographers began to look for consistent patterns in the economic landscape that could be explained with reference to producers acting rationally on the basis of their existing resources, the location of their markets, the

transportation costs of moving inputs and finished goods, and so on.

Location theory in various forms became a major preoccupation, with economic geographers gathering and analyzing quantitative data about all manner of commodity producers in order to identity spatial regularities and departures there from.

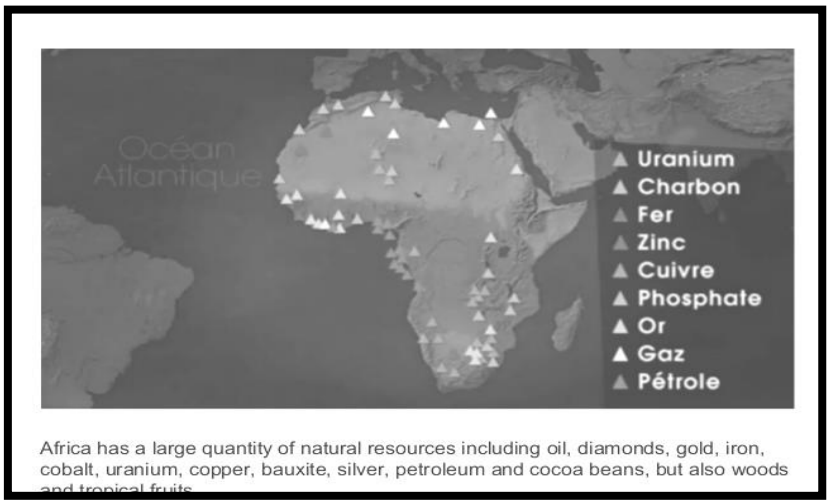
There was an emphasis on describing and seeking to explain spatial decision-making by firms, commuters, labor migrants, and so on. This approach bled into what was called '*regional science', which was linked to government planning and problem-solving.

However, from the early 1970s a new generation of economic geographers began to question quantitative economic geography. As part of the radical geography movement inspired by the worldwide political protests of 1968, these geographers offered four criticisms of the research pursued by an older generation.

First, it was accused of a naive objectivism, or belief that the 'facts' could provide a value-free, unbiased test of a theory. Second, it was criticized for its theoretical assumptions, notably the assumption that economic

actors are governed by a universal form of reason (homo economics).

Third, it was accused of focusing on phenomenal forms not underlying economic processes. Fourth, it was criticized for treating the world's economic geography as if it should (or would) display a spatial order, such that place and regional differences were mere 'noise' to be filtered out in



Africa has a large quantity of natural resources including oil, diamonds, gold, iron, cobalt, uranium, copper, bauxite, silver, petroleum and cocoa beans, but also woods and tropical fruits

the search for general patterns

Out of these criticisms emerged a new kind of economic geography indebted to political economy, especially Marxism.

This research focused on how economic actors had their spatial decision-making structured by the logics of capitalism, a historically specific system that created its own signature geographies. According to David Harvey in

The Limits to Capital (1982), capitalism rests on a geographical tension between fixity and motion, concentration and dispersal, producing inter-place competition and the compulsion for firms and investors to seek out new opportunities in other regions. Like his spatial science predecessors, Harvey believed economic activity had a certain spatial order to it, but unlike them, saw this order as fluid and unstable

Political economic geographers like Harvey saw spatial decision-making by economic actors as structured by definite 'rules' and pressures specific to capitalism, and they also saw economic decision-making as not purely 'rational', but the result of a combination of imperfect reasoning, guess work, and other distinctively human characteristics.

They also focused on large firms in order to highlight their considerable importance for jobs, income, taxation, and wider local and national economies. Doreen Massey's Spatial Divisions of Labor (1984) and Peter Dicken's Global Shift (1986) were two important contributions here during the 1980s. Dicken's book was among several works that analyzed the decline of old industrial regions in North America and Europe and the rise of 'newly industrializing

economies' in the Far East and elsewhere. Much of this work was inspired by the neo-Marxist Regulation Theory of political economy. Aside from examining firm behavior within a wider capitalist context, there were also important early attempts to understand the geographical concentrations and flows of money, notably loans by Western banks to developing countries that ended with a debt crisis by the mid-1980s. Stuart Corbridge's Debt and Development (1993) is an exemplar of this work. Still other political economic research analyzed the connections between national states and economic activity, with a particular focus on the attempt of hegemonic countries to maintain their relative economic prowess.

John Agnew and Stuart Corbridge's Mastering Space (1995) is an exemplar of this attempt to link economic and political geography together. Agnew has gone on to explore the economic underpinnings of America's waning political hegemony (in Hegemony 2005).

Much of this research was theoretically innovative and sophisticated, but it tended to avoid quantitative approaches, favoring more qualitative ones. One justification for this was that it is important to understand

how and why economic actors do what they do on their own terms.

However, quantitative approaches to describing and explaining the changing patterns of economic growth remain important, with certain university geography departments making this a signature of their research (such as the London School of Economics).

In California, Michael Storper and Allen Scott have used secondary quantitative data sets in their explorations of the roots of sustained regional economic growth. These approaches rarely extend to forecasting economic geographies, remaining focused on current and past patterns of investment and production.

Economic geography's relation to mainstream economics has grown closer since the creation of the Journal of Economic Geography in 2000. However, the sub discipline is far more politically left-wing than fifty years ago and today it draws much intellectual inspiration from the critical wings of economic sociology, business studies, the sociology of work, and management studies. The effects of the 1970s critique of location theory endure.

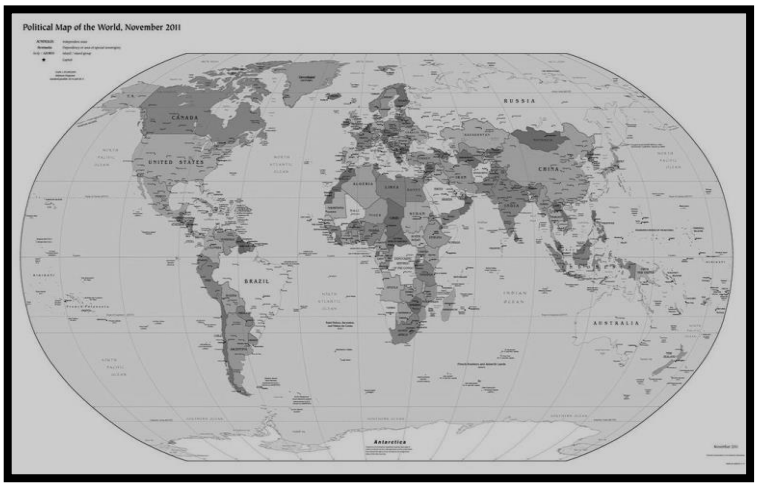
Leading economic geographers have been critics of neoliberalism and have analyzed capitalism from the

perspective of ordinary working people (see labor geography), in the process highlighting the key links between production and social reproduction.

Many have also explored how economic geographies are implicated in culture in various complex ways, thus challenging economists' belief that 'the economy' is something separate in kind. In sum, economic geography today is plural and dominated by no one approach. This makes it a rich environment for practitioners but threatens to weaken the field's external visibility and impact in academia and the wider society

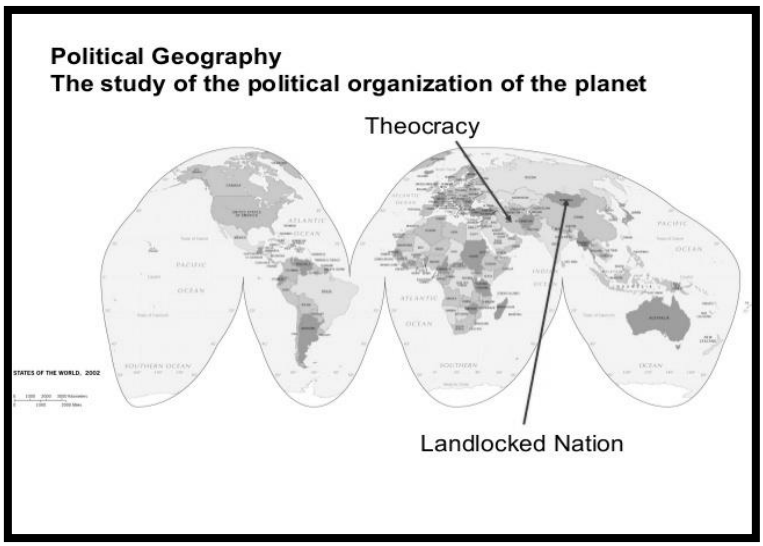
Chapter 5
Political Geography

A sub discipline concerned with the study of the spatial dimensions of politics. Although sharing many of the theories, methods, and interests as human geography in general, it has a particular interest in territory, the state, power, and boundaries (including borders), across a range of scales from the body to the planet.



'Politics' refers not simply to the formal organization of political life through government, elections, parties, etc., but all aspects of social life involving governance or where some degree of contentiousness or conflict may arise. Interpreted more broadly, therefore, political geography can encompass all those ideas about the relationships between geography and politics extending beyond academic contexts (see anti-politics)

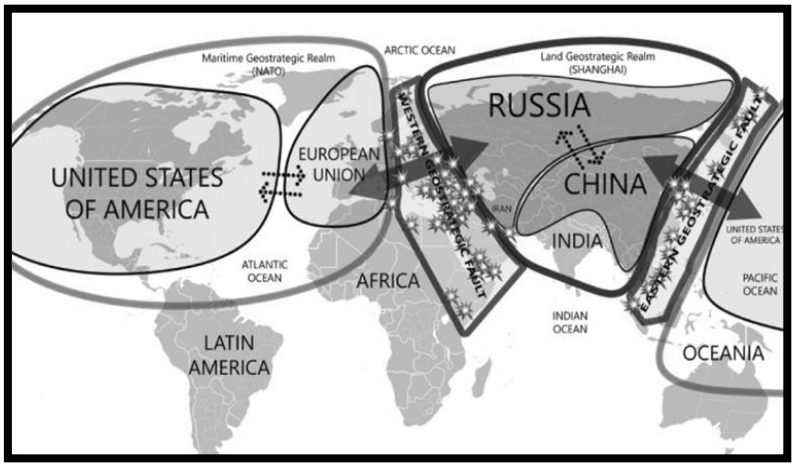
Political geography has meant and studied different things in different contexts. In the late 19th century it was partly synonymous with human geography as a whole. Friedrich Ratzel is credited with the first use of the term in his book Politische Geographie, in which he aligned non-physical



geography with the study of the state in space. Mackinder similarly distinguished political and physical geography. The work of geographers in France, Germany, Britain, and the USA in exploring the geographical foundations of state power is now more commonly classified as geopolitics. Anxious to distance themselves from the German school of geopolitik because of its close links to the Nazi regime, prominent US geographers such

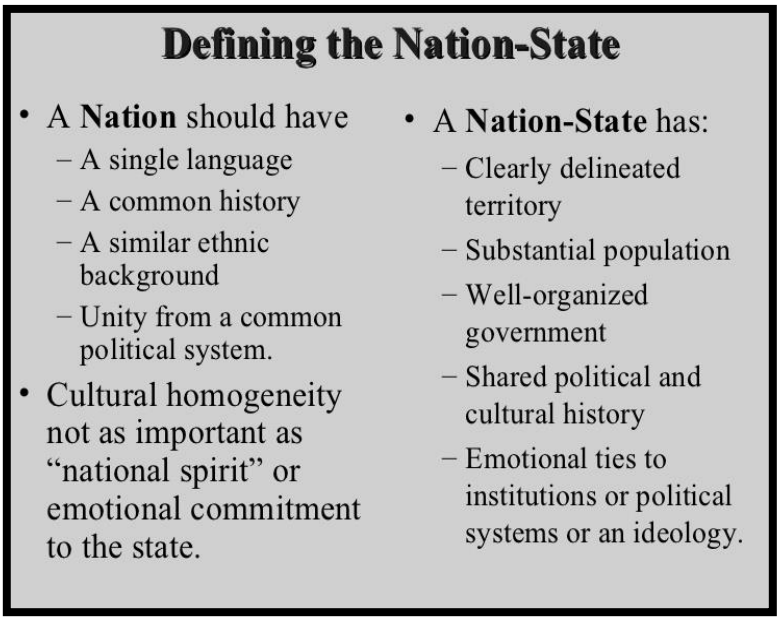
as Isaiah Bowman and Richard Hartshorne described their work as ‘political geography’.

But, actual empirical research in the field dried up, perhaps because of the taint of geopolitics, and theoretical advance halted. The main exception was work on boundaries and boundary disputes, which was a preoccupation of French and German geographers before the Second World War and of interest to British



geographers in the subsequent phase of decolonization. In terms of theory, a notable exception was the work of French geographer Jean Gottman who, like Hartshorne, tried to understand the relations between the modern state, territory, and identity. His recognition of the significance of iconography and the state idea prefigured later contributions.

In the 1960s, political geography was reframed in terms of political studies from spatial perspectives, with elections, boundaries, and subnational administrative organization



among its subject matter (see electoral geography; spatial science).

A core problem for example, was the effect of international boundaries on spatial interaction. The impact of the cultural and political upheavals across the world in the late 1960s was twofold.

On the one hand, impelled by radical geography and informed by Marxism, feminism, and socialism, swathes of human geography became politicized, i.e. were more attentive to conflict and difference and prepared to

challenge the existing order. In one sense, most if not all, human geography could be described thereafter as political. The specific area of a self-described political geography itself enjoyed a revival.

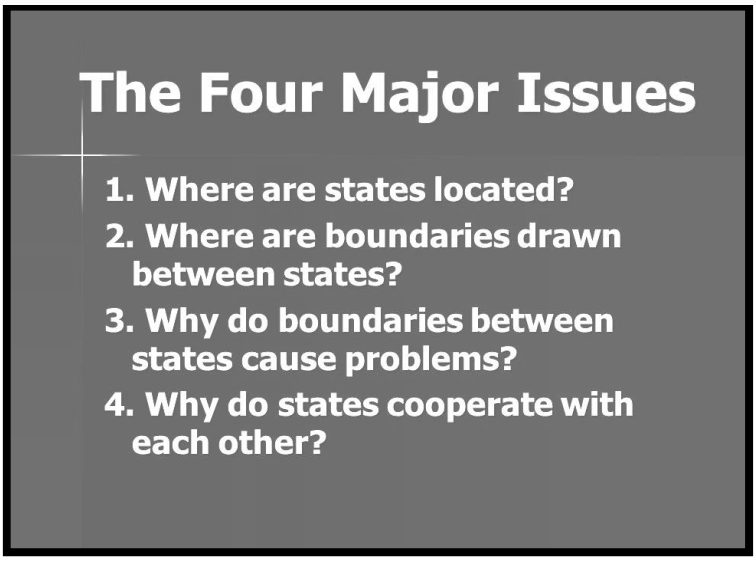
The former focus on the state gave way to an interest in the world scale; for example, in Peter Taylor's development of the world-systems approach, as well as the urban scale, in the work of Kevin Cox, Ron Johnston, David Harvey, and others. Issues of class, and later race, gender, and sexuality came to the fore.

In France, Yves Lacoste founded the journal Hérodote (1976) to introduce French geographers to some of the radical ideas of the country's new generation of social and political theorists. The leading journal Political Geography Quarterly (later renamed Political Geography) was founded in 1982, marking the recovery of the field.

Thereafter, political geography generated and responded to the same currents as human geography in general, including postmodernism, post-structuralism, and post-colonialism (see critical geopolitics). To the long-standing interests in the state, power and boundaries, modern courses and texts in the field include sexual politics,

citizenship, social movements, civil society, globalization, and environment.

Indeed, globalization has reopened older debates about the



relations between territory, identity, and boundaries. Wars in the Balkans, Afghanistan, and Iraq, and the related 'war on terror' have prompted a greater interest in violence, both state and non-state (see terrorism; war).

Political ecology marks the overlap between political geography and a concern for nature, resources, and the environment.

Given the significance of climate change, food security, and oil resources, political geographers have in some ways revived the preoccupations of their 19th-century

predecessors for the physical environment, although without the trappings of environmental determinism.

shape of the land:

The boundaries of a country and the shape of the land that it encompasses can present problems or it can help unify the nation. Each shape of state has advantages, as well as disadvantages.

The shape of most countries can be divided into five main categories: compact, prorated, perforated, fragmented, and elongated.

-Compact:

A compact shaped state is small and centralized. This type of state is the simplest to manage, since the government is close to all portions of the state.

The compact form helps to keep the country together by making communications easier within it. In

addition, compact states are much easier to defend than states of other shapes. However, compact states are primarily small in size, and therefore may not have as many natural resources as larger states have. A perfect example of a compact state would be Poland.

- prorated: prorated state has a long extension, or an extended arm of territory. This protrusion gives the state several advantages. For example, the state gets easy access to the coast and the local resources around it. In addition, prorated states are also able to prevent a rival access. An example of a prorated state would be Thailand.

- Perforated:

perforated state completely surrounds another. A classic example would be South Africa since it surrounds Lesotho. The surrounded nation can only be reached by going

through one country. More problems can arise if there is hostility between the two nations. This makes it difficult to enter the surrounding nation. --

-Fragmented :

A state that is separated by a physical or human barrier. This creates several problems for the country. Many portions of the state are separated by oceans, lakes, and mountains. It is difficult to govern such a country composed of islands, such as Indonesia. In addition, communication is difficult within the state; since portions are separated from the main part of the country.

– Elongated*:*

An elongated shaped state is long and narrow. This type of state also has many disadvantages. For example, they are difficult to defend. An elongated state, such as Chile, makes for

difficult governance of the peripheral areas in the north and south. However, an elongated state encompasses a variety of landscapes

– **Enclave:**

A country or part of a country that is surrounded by another. However, an enclave does not have political affinity to the surrounding state. Also, an enclave does not belong to another country. For example, the Vatican City is an enclave of Rome. The Vatican City has its own government and is independent from Rome and Italy. Therefore, it is not bound by the rules of Rome, as well as the rules of Italy

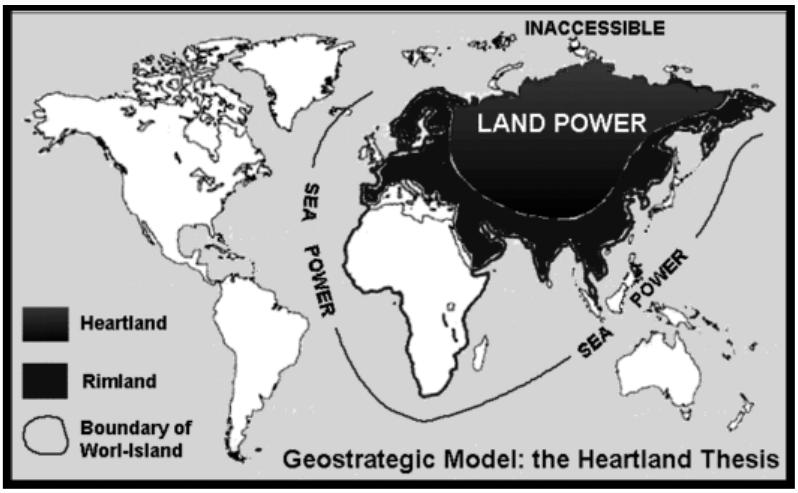
– **Exclave*:***

An exclave is part of a country that is or almost completely separated from the main part of the country. Alaska is an example of an exclave. Although it is separated from the U.S., it shares boundaries

with Canada. Another example is Hawaii, which is completely separated from the U.S. by the Pacific Ocean.

-The Heartland Theory:

In 1904, Sir Helford Mackinder published the Heartland theory. The theory proposed that whoever controls Eastern Europe controls the Heartland. It also supported the



concept of world dominance.

more revised version explains that whoever controls the heartland, controls the world island. Whoever controls the World Island, will soon rule the world. In other words, the group or nation who

dominates the heartland, can then extend its domination over a far wider area. The heartland has primarily been Central Asia, the high seas, and Eurasia.

The Nazi party was in favor of the concept during World War II. The idea was very popular with the party, and they sought to achieve it. Also, the theory was accepted by the Soviet Union during the Cold War. Each nation made great territorial strides toward the heartland, but to no avail.

-Mahan's Sea Power Theory:

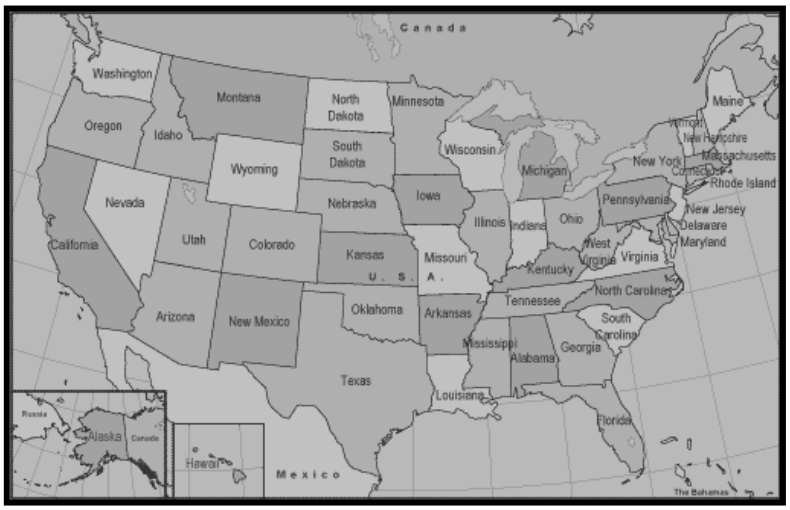
Alfred Thayer Mahan believed that domination and power was associated with the sea, with its usage for trade and its control in war. He soon published his theory in his book, *The Influence of Sea Power Upon History,* which discussed the factors needed to support and achieve sea power.

- Explanation Mahan argued that sea power was crucial in determining national supremacy. In other words, if you controlled the sea, you would control the whole world.
- Example The British Empire first adopted Mahan's theory and used the strategy to win many decisive battles. The United States also accepted Mahan's theory and used it tactically in several battles as well. Today, the United States has naval fleets stationed at sea, which also supports the theory.

-Federal and Unitary States:

federal state places its power in the hands of a central government, as well as its sub-state territorial units. A unitary state, however, shares its power between local and national governments.

- Explanation :In a unitary state, sub national units are created as well as abolished. Their powers may even be broadened and narrowed. The small administrative divisions exercise only powers that the central government, which remains supreme, chooses to appoint. On the contrary, federal states share sovereignty with the



central government. The states of the federation have an existence and power functions that can't be changed by the central government. Some countries are unitary states,

but also have federal systems. These countries are considered a hybrid of the two.

- Example The United Kingdom is an example of a unitary state. Wales, Scotland, and Northern Ireland, and England all have a degree of autonomous devolved power. However, the power is only appointed by Britain's central government. An example of a federal state is the United States. Power is shared between the federal government of the U.S. and the U.S. states individually.

Chapter 6

Geography of Travel & Tourism

Geography of Travel & Tourism

A term to cover travel to places away from one's home environment undertaken principally for leisure but also for business.

Tourist activities generally involve spending money in a new location and do not involve remuneration from within the place or country visited. Definitions of tourism by international organizations such as the World Tourist Organization recognize anyone who spends at least one night but no longer than one year somewhere other than

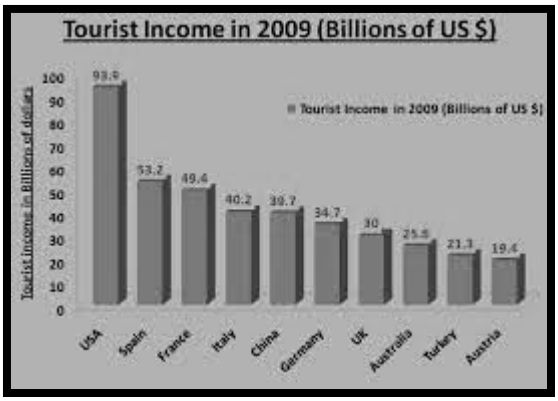
their country of residence as a tourist. Tourism is often distinguished from recreation because it takes place further from the home and is more commercialized. It overlaps with leisure, but includes business travel. In The Tourist Gaze (1991) John Urry argued persuasively that the core feature of tourism was the desire to gaze upon what

was different or unusual. Much of tourism can be understood in terms of the arrangements of places and landscapes to be viewed, and the cultivation of techniques of viewing and circulating images, e.g. photography, video, postcards, etc.

But tourist activities do more than please the sense of sight, and often involve multiple embodied experiences, e.g. kayaking, dining, and sunbathing. Tourism is a form of and has its origins in travel, but a distinction is often made between the two; travel is described as a more specialized, niche, or selective activity, while tourism is associated with organized popular or mass activities.

In part, the difference is one of marketing or discourse. Although tourism now includes an increasingly diverse range of activities, perhaps too many for convenient classification, it is often described as the world's largest industry. The World Travel and Tourist Council estimates that tourism accounts for 11 per cent of world GDP and 8 per cent of all waged work (200 million employees). But tourism as it is now understood is a relatively recent phenomenon.

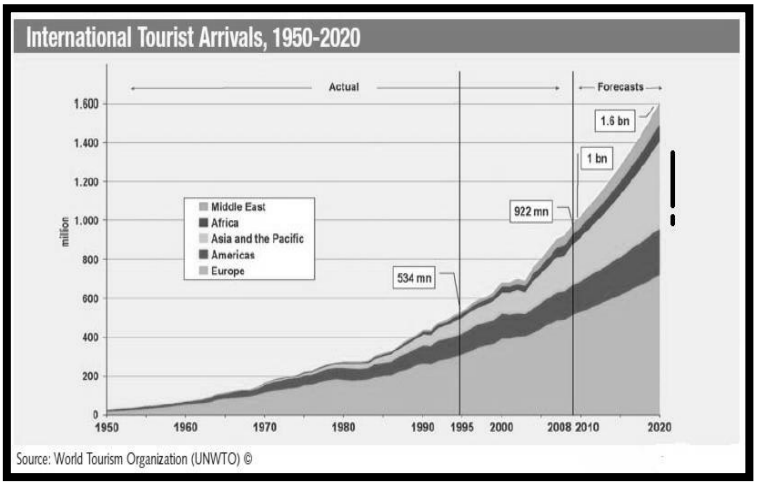
Most historical accounts trace its origins to the Grand Tour, undertaken by elite young European men between the 17th and 19th centuries. They would travel within Europe to see and learn about cultural matters, notably the fruits of the Renaissance and Greek and Roman classical civilizations.



Health spas, seaside towns, and mountain resorts also became fixtures for the wealthy traveler. The 19th century saw the development of journeys to wild places inspired by romantic ideas or picturesque or sublime landscapes: England's Lake District was a leading attraction (see wilderness).

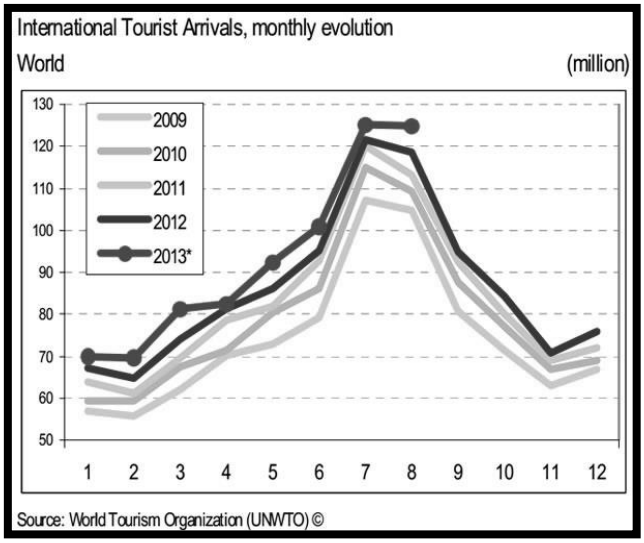
The spread of road and rail travel in the 19th century allowed the urban working classes to enjoy annual trips to seaside resorts such as Long Island, New York, ushering in the first organized tourist industry.

But it was not until the combination of greater affluence, more leisure time, and air travel after the Second World War that modern mass tourism took off. Until the late 20th century, however, it remained open largely to Westerners, and Europe itself accounted for the majority of international tourist journeys.



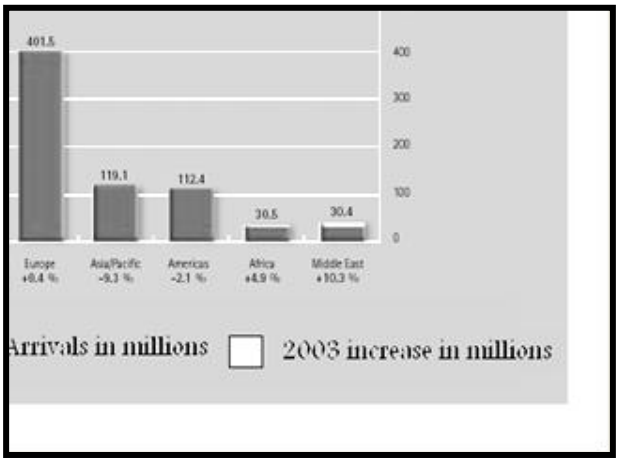
The globalization of tourism in the past two or so decades has involved almost every country becoming both an origin and destination of tourist travel to some degree. Close to a billion international tourist visits are now made annually, with China established in the top five for destinations and origins, alongside the USA and European countries. Singapore, Kuala Lumpur, and Dubai also count among the top tourist urban destinations.

The geographical interest in tourism has developed strongly since the 1980s, although there are studies dating back to the 1930s. It draws upon the same range of methods and perspectives as the rest of human geography, although there are important overlaps with



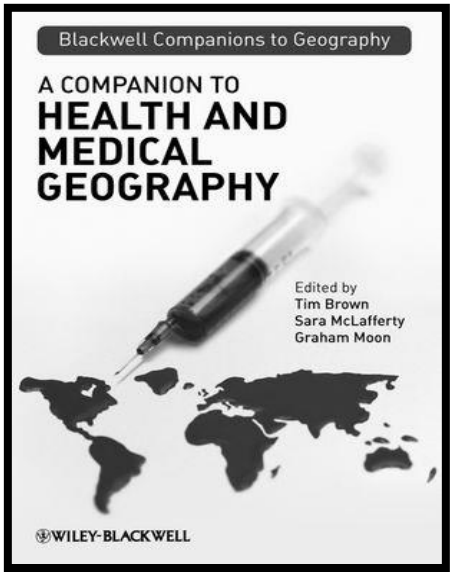
environmental geography (for example, in coastal and marine environment management) and a strong element of applied geography. Given that tourism hinges precisely on the differences between one place and another, it is intrinsically geographical. The main areas of research are on factors of supply and demand, but also on social, economic, and environmental impact (see resort life-cycle model). There are separate studies of urban and rural tourism, as well as a concern for regional differences (Hudman and Jackson 2003).

The different forms of tourism and their related bodily and sensuous experiences—heritage visits, ecotourism, package holidays, adventure travel, and backpacking among them—are also well studied. In unpacking the experiences of tours, however, it becomes apparent how many of its core characteristics—difference, exoticism, cosmopolitanism, leisureliness—are increasingly found more widely and even close to home. The interests of tourist studies in mobility, pleasure, and difference are, in this regard, central to much of current human geography. Travel & Tourism



Chapter 7
Medical Geography

Medical Geography does not have particularly strong links with 'medicine', as normally understood (i.e. the treatment of people who are ill), so many medical geographers now prefer to refer to their subject as the 'Geography of Health and Health Care' and to themselves as 'health geographers'. However, I am not convinced that such formulations represent an improvement.

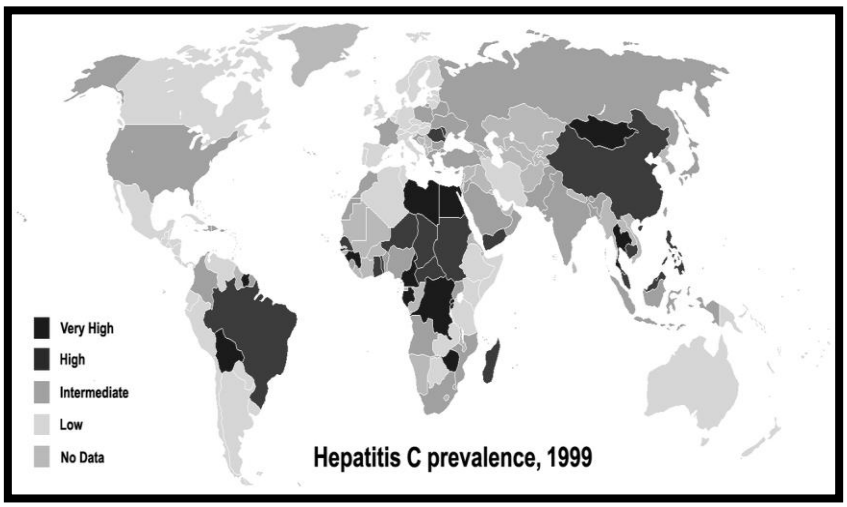


Although correctly recognizing that health is more than the absence of illness, most health geographers do not actually examine health in practice – they examine illness and/or disease. They should therefore call themselves 'illness geographers' or possibly 'disease geographers' (or even 'dies-ease geographers')

At a purely semantic level, the change in name to 'health geographer' does not appear to be any more accurate than 'medical geographer'. I suspect that the search for a label to accurately describe what all medical geographers do is probably futile.

As far as I aware, the term 'health geography' originated in a series of articles written by Robin Kearns in the 1990s arguing that 'medical geography should be (re)situated within social geography'. In his initial paper he wrote: 'Rather than advocating a renaming of medical geography, I suggest that two interrelated streams be identified within the medicine/health/geography nexus: *medical* geography and the geography of health. The concerns of the former are well known and involve spatial and ecological perspectives on disease and health care delivery.

The concerns of the latter would consider the dynamic



relationship between health and place and the impacts of both health services and the health of population groups on the vitality of places'. (Professional Geographer 45(2), 144–5)

I am personally much more interested in how geographical analysis can provide us with insights about health and ill-health, than in how health issues can inform us about the nature of places. Also, whilst recognizing the central importance of social factors as determinants of health (especially in developed countries), I recognize that they are by no means the only factors.

For both reasons, I would therefore regard myself as a 'medical geographer' rather than a 'health geographer' (as defined above).

The debate over the name also reflects a debate over deeper issues related to epistemology and methodology. The new 'post-medical' health geography tends to differ from more traditional medical geography by placing the emphasis differently along a number of axes:

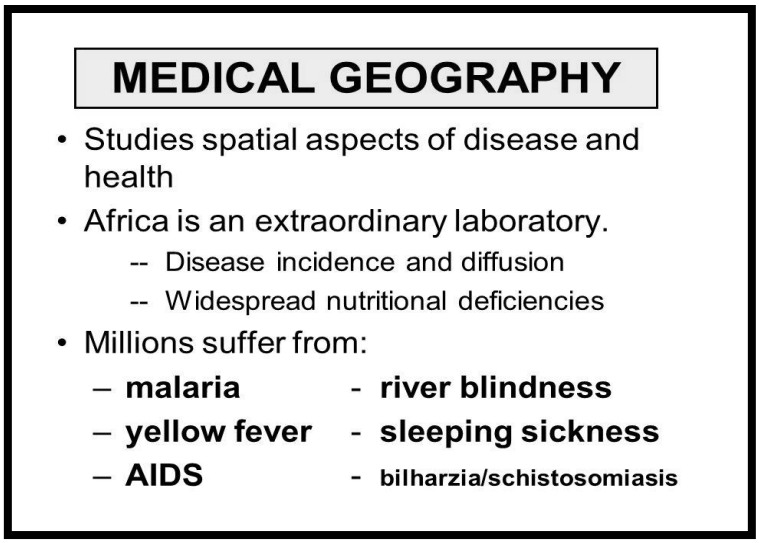
-Place versus space. Health geographers put the emphasis on place as opposed to space - i.e. the unique characteristics of particular places as opposed to spatial variations and relationships.

-Geographical scale. There is a tendency for health geographers to focus on the relationship between people and their local contexts, as opposed to variations between places at a regional, national, or even international level.

- Qualitative versus quantitative research methodologies. Health geographers tend to favor qualitative methodologies

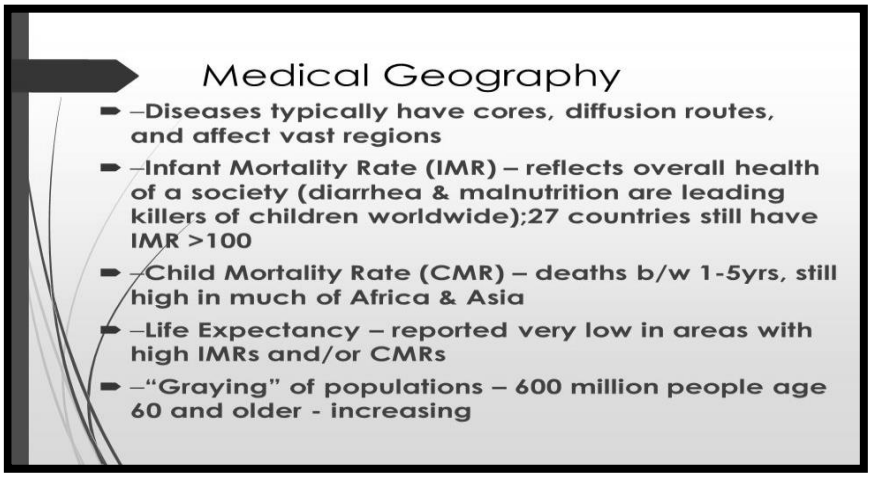
(e.g. in-depth interviews) as opposed to quantitative methodologies (e.g. statistical analysis of mortality or morbidity data).

-The centrality of social theory. Health geographers tend to be firmly rooted within social theory, whereas more traditional medical geographers tend to be more eclectic (bordering in some instances on a theoretical empiricism). Some health geographers argue that the 'new' health geography is more concerned than more traditional medical geography with the prevention of illness rather than curing people who are already sick. However, in my opinion this argument is fallacious, as medical



geographers have always strongly motivated by a preventive ethos, and have always been critical of the orthodoxy imposed by mainstream curative medicine,

especially on the epidemiological side of the subject (see below).



Irrespective of whether one prefers to use the term Medical Geography or Health Geography, the discipline has traditionally been divided into two fairly distinct subjects: one examines the geographical factors which contribute to ill-health and disease (geographical epidemiology); whereas the other deals with geographical factors influencing the provision of and access to health services (geography of health care).

The two branches of Medical/Health Geography influence one another much less than one might imagine, and most medical/health geographers tend to be very strongly focused in one area or the other, but rarely both.

This, I would suggest, is because the major findings in each branch of Medical/Health Geography are largely irrelevant to the major concerns of the other.

For example, when examining the factors influencing spatial inequalities in health, inequalities in access to health care are a relatively minor factor – or, to put it more cynically, the evidence suggests that the capacity of the medical profession to bring about improvements in the health of populations is much less marked than most people probably assume. Social inequalities and environmental factors tend to be much more important determinants of inequalities in health than access to health care (and should therefore receive greater attention from policy makers entrusted with the health of the nation).

By the same token, spatial inequalities in health (as measured, for example, by differences in life expectancy) are a relatively minor factor when trying to predict which areas will have the greatest need for health services. Population numbers and simple demographic factors, such as the age and sex distribution of the population, are much more important determinants.

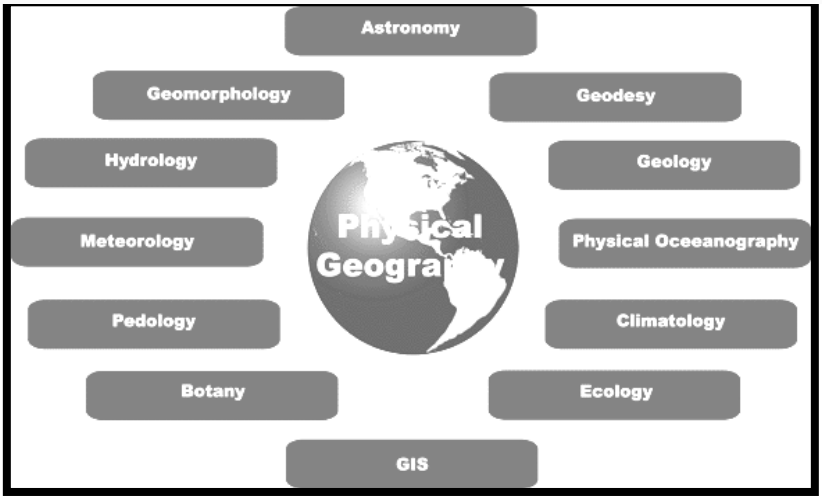
Geographical epidemiology therefore has relatively few insights to offer those whose main concern is in maximizing accessibility to health care.

Thus the two branches manage to maintain an almost separate existence. (N.B. These views are my own, and would not necessarily be shared by other medical/health geographers.)

second

Physical Geography

Physical geography (also called earth science, or geosystems or physiography) is the study of our home planet and all of its components: its lands, waters,



atmosphere, and interior.

the processes of the atmosphere and its relationship to the planet's surface and all our living creatures. For as long as people have been on the planet, humans have had to live within Earth's boundaries. Now human life is having a profound effect on the planet. Several chapters are devoted to the effect people have on the planet.

The journey to better understanding Earth begins here with an exploration of how scientists learn about the natural world and introduces you to the study of physical geography and earth science.

is one of the two major sub-fields of geography. Physical geography is that branch of natural science which deals

with the study of processes and patterns in the natural environment like the atmosphere, hydrosphere, biosphere, and geosphere, as opposed to the cultural or built environment, the domain of human geography.

Physical Geography is a sub-discipline of two much larger fields of study - Geography and Earth Sciences. The main purpose of Physical Geography is to explain the spatial characteristics of the various natural phenomena associated with the Earth's hydrosphere, biosphere, atmosphere, and lithosphere.

Chapter 1
The Lithosphere

Is the name which we give to the solid crust of the earth. The materials of which it is composed are called rocks, whether they be hard soft.

Geology is the name of the science which deals with the crust of the earth, but it is necessary for us in geography to know something about its nature and composition.

We have learnt that the hypo sphere is the mantle of water which griddles the earth, but the lithosphere project through it and forms the continents. It is almost impossible to study that part of the lithosphere which is hidden below the ocean,

we can only study that part which forms the land.

- Changing in the earth's crust:

It is most important to release that changes are continually taking place on the surface of the earth. The change while are going on continually but gradually are of the three main kinds:

1- the wearing away of the land, which we call denudation. The wearing away which take place in the air is called Wearing.

2- the removal of material from one part of the earth's crust to another, which we call Transportation.

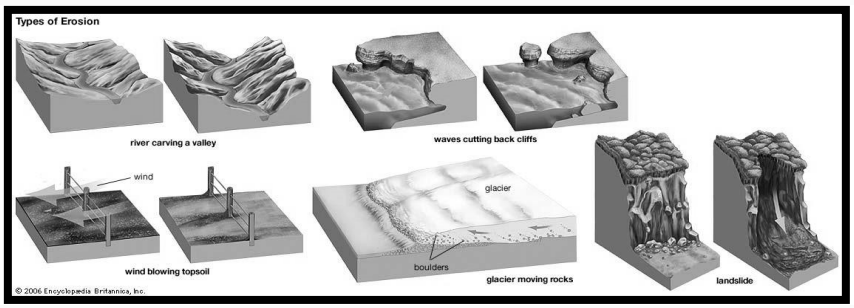
3-the laying down of this material in fresh, which we call Deposition.

There are also more sudden or discontinuous changes such as earthquakes, volcanic, eruptions, etc

- Denudation of Erosion:

As soon as dry land appears above the surface of the ocean there are forces waiting to where it away, this is very apparent after a heavy rainstorm. The rain beats down on the ground and removes loses particles of soil, so that after a storm one may often

see that tiny valley have been cut at sides of the roads.



More of the larger streams and rivers of the British Isles especially after a period of heavy rains, are very muddy. The mud has been brought by the river from far away and is being carried out sea, where it will all be deposited. The rain and rivers are not the only against of the denudation, there are others.

Thus the chief agents to be considered are the sun, wind, rain, frost, running water, moving ice and the sea.

-Action of the sun:

In hot countries the heat of the sun is very great during the day, and the rocks on the surface are made very hot. We know that when most things are made hot they expand or grow large, but some substances expand than other.

The rocks of the earth's crust consist of different substances called minerals, and the minerals expand at different rates.

One mineral expanding more quickly than the others causes the rock to burst so that cracks are formed. Then at night time the rocks get very cold and contract.

When this process is repeated day after day the cracks increase in size and gradually the rock breaks up into small pieces. This action of the sun is called Insulation, and is important in hot dry countries.

There are a few substances, too like salt, which are dissolved by pure water.

- Frost:

The action of frost is important in cold countries when the rain falls, part of it sinks into the ground and fills up the cracks in the rocks. At night, when it becomes very cold, the water in the crack freezes. Now when water is changed into ice it expands, so that the force of the water in the

crack expending when it is changing into ice causes the rock to widen.

This goes on night after night the crack becomes very wide, and one day when the ice melts a lamp of rock breaks off.

Frost is one of the most powerful agents in cutting away the tops of high mountains. It causes them to be very rugged and sharp edged. The angular blocks fall to the foot of the mountain and from heaps called Screed

- Running water:

When rain falls on the ground some of it sinks in, but a great part of it

collects together to form little streams, which in their turn join up to form rivers.

The streams cut for themselves little valleys, which at first tend to be deep and narrow.

The rain helps to wash away the banks, so that the valley becomes broader and broader with age.

The force of the water itself is sufficient to do a great deal of damage, especially after a heavy storm when the stream is in flood. But it is enormously increased by the load of stones and sand which the water collects.

Denudation by rivers and moving water takes place in all parts of the world except the very coldest. The denuding action of a river is greatest in its upper course, where it is following down steep slopes. Big slow rivers like the Thames or Rhine have little power to wear away the land.

- Moving ice:

In very cold countries, and in high mountains districts there it is equally cold, we find solid masses of ice instead of rivers.

These rivers of ice are called glaciers. Like rivers they occupy valleys. Compared with rivers, glaciers move only very slowly, but they do move. Fresh snow is falling on the mountains behind them and by its weight helps to push the glacier down its sloping valley. Some very cold countries such as Greenland are almost completely covered by a great ice – sheet. Formerly similar

ice-sheets covered much of Europe including the greater part of the British Isles and North America, and have left behind many evidences of their one-time existence.

- The Sea:

is a powerful agent in wearing away the land, especially in time of storm. Each wave hurries a great means of water against the shore and washed away the soft parts

Naturally, the sea cuts away the soft rocks more rapidly than the hard. The harder parts are left as headlands, caps, and islands. Not only the coast, but it pounds the pieces against one another till they are worm into pebbles and sand.

The action of the sea does not extend to a great depth, and the area of land which has been worm away is marked roughly by the extent of the continental.

We must notice that the other agent of denudation cut the surface into hills and valleys. But the sea wears them away until a nearly flat surface is formed.

- Transportation:

Some of the same agents which are capable of wearing away the land are also able to carry the material from one place to another.

Wind:

The wind blows fine dust for great distance. The interior of China is covered by a thick mantle of fine dust – called Loess-, which has been blown to its present position by the wind.

Wind also blows sand from the sea shore for great distances in land. Dust-storm are common in dry country and in deserts sand is constantly moved by the wind. In dray farming country the wind sometimes causes great damage by blowing away the soil (wind erosion).

-Running water:

Rivers are the most important of all transporters of material. Some of them are many thousands of miles long, and so carry mud and sand for enormous distances.

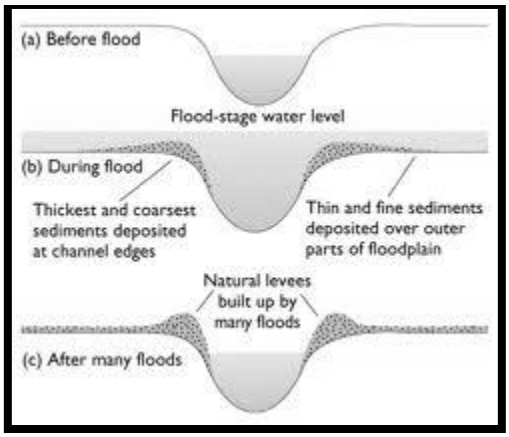
- suspension:

that is suspended in the water itself. If one takes some water out of our rivers when in flood it is very muddy. If the water is left for some time without moving it, the mud will settle to the bottom .

Fine particles such as mud, silt and sand transported in this way are be carried in suspension.

2- Along the bed of the river:

quite large stones can be moved great distances by being rolled along the bed, but as they are rolled along they are knocked against one another and gradually made smaller.



-Moving Ice:

Glaciers also carry material in two ways. Mud, stones, and big boulders are frozen into the bottom of the glacier and make the surface over which they are carried with long scratches.

-The sea:

The sea carries material in two directions. It rolls pebbles and sand laterally along the coast. It also gradually moves the material which it broken away from the coast into

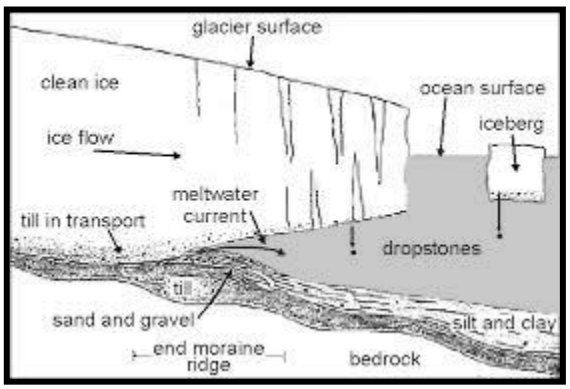
deeper and deeper water. Mater of the material brought down by rivers is farther away when it reaches the sea.

-DEPOSITION:

There comes a time when all the material which has been worn away from one part of the earth and carried to another is laid down again or deposited.

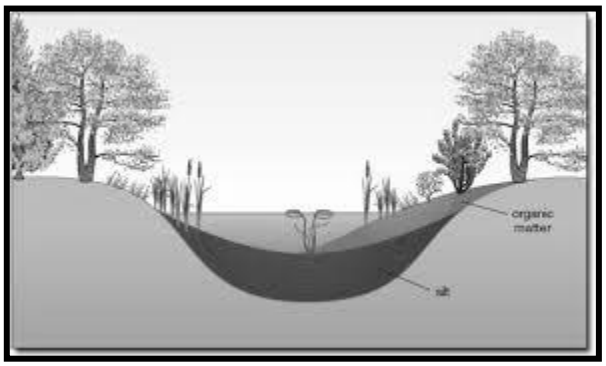
-Wind deposits:

The land in dry countries – China- are often covered by a thick mantle of wind-borne dust called Loess. The sand pollen from sea shores and in desert is deposited as crescent shaped sand dunes. The sand dunes found on many parts of the coast of Corneal (England) are good examples.



-River Deposits:

Where a swiftly flowing mountain stream suddenly enters a flat area it often drops mud and stones, forming an alluvial fan. Where a river enters on a flatter portion of its valley and the current becomes slower. The river drops mach of the sand



it is carrying and so forms sand banks.

-Lake Deposits:

When a river enters a lake, mud and sand are dropped until gradually the lakes filled up. Lake Geneva is a good example.

-Glacial Deposits:

When glacier from the mountains descends to lower levels where the air is warmer, the ice melts and the moraines are deposited.

-Sea Deposits:

or Marine Deposits. Near the shore we find coarse deposits of sand and pebbles (Littoral Deposits).

-Organic Deposits:

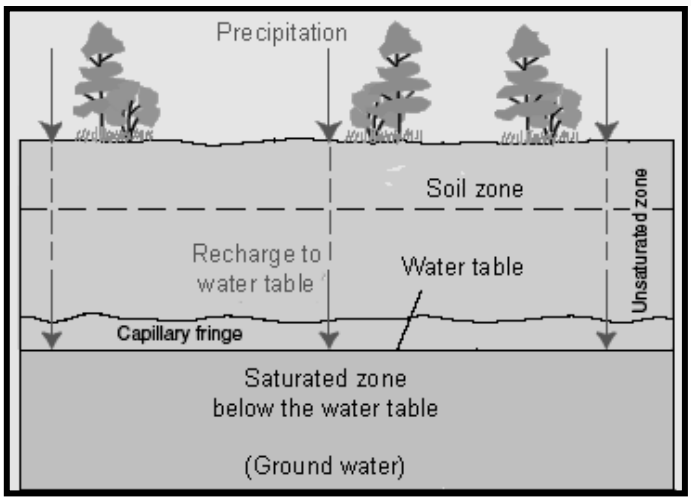
Besides mud, sand, and stones which are dropped on the floor of seas ,lakes and rivers, we find deposits which are formed of the remains of animals and plants.

-The River Basin:

The whole of an area drained by a river and its branches is called the river basin. Tow basin are usually separated by a ridge or hills which form the water – parting or watershed. Some river drain into lakes with no outlet and not into the sea at all, and their basins are called basins of in land drainage.

-Underground water:

Some of the rain which falls up on the ground sinks into the rocks beneath. The amount which sinks in depends upon the nature of rocks. Some rocks allow water to pass through them very easily- they full of small cracks or holes- and are called permeable.

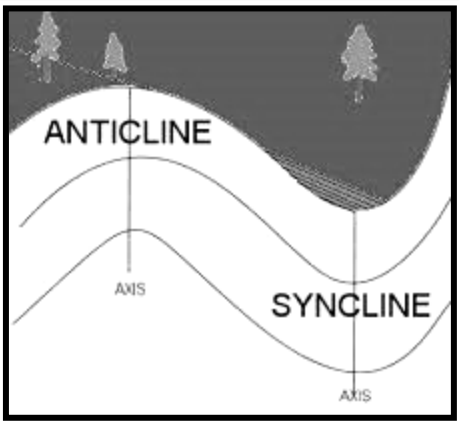


Other rocks like clay will not allow water to pass through them, and are called impermeable .

Let us see what happens when the rain-water sinks underground and meets an impermeable rock. It will then travel along the surface and find its way out on a hill side as a spring.

Such as a spring often forms the source of a river, see what happens when the rocks are bent into a hollow curve or syncline . The water is trapped in the center, and by putting a well in the center we get a good supply of water.

Such a well is called an artesian well. If the water gushed out at the surface, there is a small artesian basin under London, and in the Murray basin and many other parts of Australia, there are vast artesian areas tapped by numerous wells .

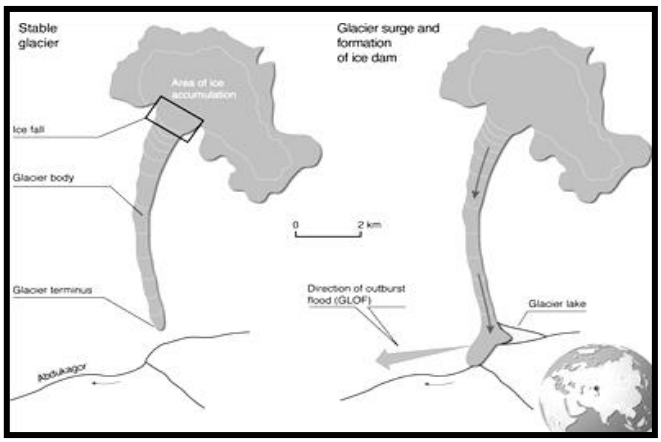


- The Formation of Lakes:

Lakes may originate in many ways.

1- A river valley may be blocked by a fall of rock or a lava flow.

2- The lower end of a river valley may be raised up by an earthquake. Many of the lakes in the Alps were formed in this way.



3- An arm of the sea may be cut off to form a lake. The Caspian Sea has been formed in this way.

4-Sand- dunes throw up the sea may impound river water coming

river – bed may form lakes.

5- Small lakes may occupy the craters of old volcanoes. down from the hills. The shallow lakes Alexandria, Albert, and the Coorong at the ,oath of the Murray in Australia have been formed thus.

6- Parts of deserted

7- Many lakes occupy hollows scooped out by glaciers or by the great ice- sheets which once covered many parts of the globe. The lakes of Canada are examples.

8- Some important lakes occupy rift valleys, Lake Tanganyika is a good example.

Chapter 2
Sudden changes in the earth's crust

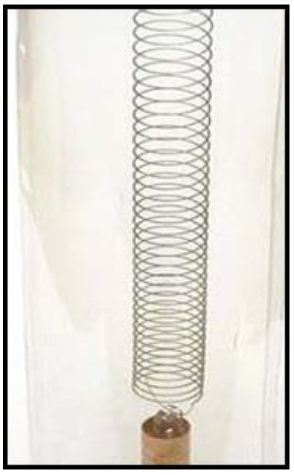
When the crust gets weak the pressure is less, and so underground where it is very hot the rocks become molten and begin to move. The movement of molten rock underground causes the solid crust shake, and this causes earthquakes.

Sometimes the molten finds its way to the surface and is poured out as volcano.

- **Earthquakes:**

Earthquakes also called temblors, can be so tremendously destructive, it' s hard to imagine they occur by the thousands every day around the world, usually in the form of small tremors.

(Seismograph)

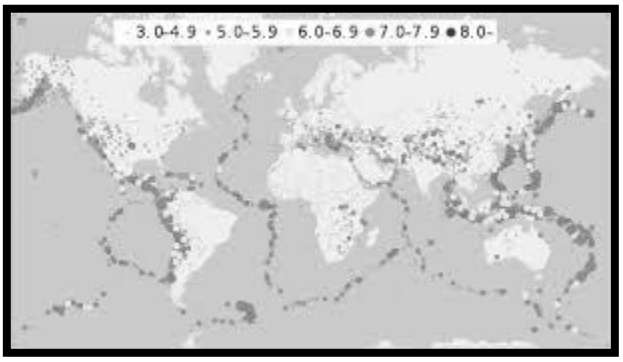


The movement of molten deep down in the earth's crust causes the surface at shake, and we living on the surface, feel an earthquake. Some earthquakes are connected with volcanic eruption, but much more important are the earthquakes which result from the movement of material underground – a movement which we cannot see.

Like volcanoes, earthquakes usually occur along weak places in the earth's crust Some of them are actually connected with cracks in the crust.

These faults and often after an earthquakes the rocks on one side of the fault are seen to have moved up and on the other side to have moved down, leaving a small cliff.

We see that there are four principal result of earthquakes:



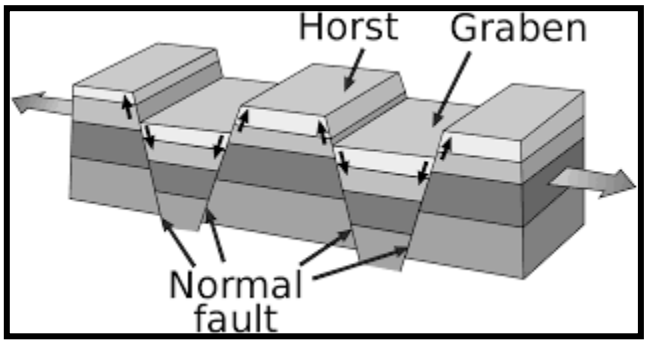
1- the surface of the earth is folded, some parts move up and others move down .

2- Along cracks of faults the rocks are moved up on one side and down on the other or sometimes sideways.

3- large areas may be lifted up above sea-level so that they become dry land, other areas of dry land become covered by the sea.

4- In some parts of the world large blocks of country have been rent by great cracks crossing one another roughly at right angles, along cracks the rocks are shattered and more easily removed by the agents of denudation such as rivers and glaciers.

The two most important kinds of mountains are fold mountains and block mountains.



Both kinds are produced by a long series of earthquakes.

-Fold mountains:

As a result of one series of earthquakes a level stretch of the earth is gently folded like this: one part is ridged up to form mountains often of great high while the other part is covered by the water of the ocean.

Mountains formed in this way are by far the most important in the world – the Himalayas, Alps, Andes, Rockies, etc. They usually form long lines or ranges of mountains, such as the great chain which runs through the continent of America from north to south.

Of course it takes a long time and a great many earthquakes for such a great mountain chain to grow.

The mountains of Wales and many of Scotland are those of folded mountains of ancient rocks.

-Block mountain :

sometimes a big mass of land is pushed up between several cracks and so forms a mountain which we call a block mountain.

-Mountains of accumulation: there are other kinds of mountains besides fold and block mountains. Volcanoes are often called Mountains of

Accumulation because they are formed by the accumulation of material which is thrown out on the surface and so gradually built up into hills.

The new example of such a mountain Paricutin in Mexico. It only began to accumulate in 1944, four years later it was 2.000 feet high.

Mountains of Denudation:

We have learnt how the agents of denudation gradually wear away the surface of the land. As soon as block mountains or fold mountains are formed they begin to get worn away some times only a small piece of the original mountains may be left, all the rest being worn away. Such a fragment left behind is called a mountain of denudation. The peak, Derbyshire, is a good example.

Slow movements of Elevation and Depression:

A single earthquake may produce a considerable change, and several earthquakes may result in great changes

although no mountains are formed. We find that in many parts of the world the land is steadily rising or sinking.

In many parts of the world beds of seals are found high above sea-level. In the raised beaches round the English coasts; in other parts the remains of forests are found covered by the sea. This shows that the land relative to the level of the sea is rising in some parts and sinking in other.

- Plains and plateaus:

We learnt that the sea is the most important agent which wears away a flat surface(the surface of the continental). If part of this surface becomes raised into dry land, it forms a pen plain.

A pen plain may also be formed by rivers, when a river becomes old it swings from side to side, and gradually the valley sides are worn and almost disappear.

The ridge between one valley and the next can be seen, and the whole surface of the land is almost a plain-a pen plain, sometimes spelt pen plain.

-The movement of elevation:

may cause a large area to be raised a considerable height above the see- level. We must remember that as soon as a stretch of dry land is formed; the sun, rain, frost, running water, and ice commence to wear away .

Such a big flat- topped stretch of high land is called a plateau. If the rocks are soft they will be worn away quickly, but if they are hard, they are removed only slowly. Only the top of the mountains remain a approximately on a level to remained a dissected plateau and peninsula India is an example.

-Volcanoes:

A volcano is a vent or fissure in Earth's crust through which lava, ash, rock and gases erupt. A volcano is also a mountain formed by the accumulation of these eruptive products. Let's take a look at how volcanoes form:

Earth's crust is 40 to 250 miles (64 to 402 kilometers) thick. It is broken up into 14 major and 38 smaller pieces called tectonic plates.

These plates float on a layer of magma — semi-liquid rock and dissolved gases. At the boundaries of these plates — where they move past, are pushed under, or move away from each other — magma, which is lighter than the surrounding solid rock, is often able to force its

way up through cracks and fissures. Magma can explode from the vent, or it can flow out of the volcano like an overflowing cup. Magma that has erupted is called lava.

-Volcanoes in history:

A.D. 79: One of the most famous volcanoes is Mount Vesuvius, which sits along the Bay of Naples in southern Italy. It has erupted more than 50 times in the past 2,000 years. The A.D. 79 eruption, which buried Pompeii, made Vesuvius famous, but another eruption in 1631 killed some 4,000 people.

1669: In Sicily, Mount Etna sent a river of lava through the streets of Catania, killing some 20,000 people there and in the surrounding region. [Video: Mount Etna's Dramatic New Eruption]

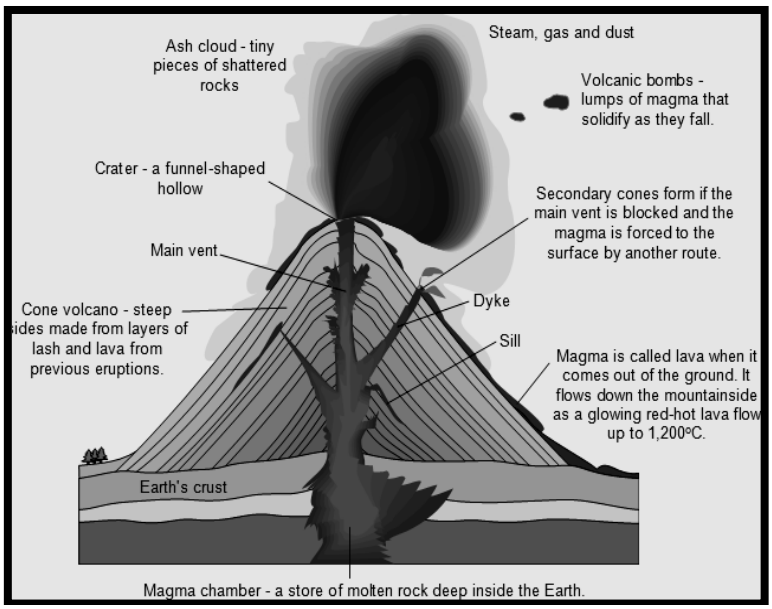
1783: The eruption of Mount Skaptar in Iceland devastated farming and fishing, causing a famine that killed a fifth of the country's people.

1815:Whirlwinds and tsunamis from the eruption of Mount Tambora, on Sumbawa Island in Indonesia, killed 12,000 people. The volcano sent a cloud ejecta into the atmosphere that was more than four times the amount ejected by Mount Pinatubo in 1991.

1883: Another Indonesian volcano, Krakatoa, erupted in an explosion heard 3,000 miles away. Seventy-pound boulders

landed on islands 50 miles away, and a 130-foot tsunami devastated hundreds of villages, including Java and Sumatra. About 36,000 people died. Dust high in the atmosphere caused the Moon to appear blue, and sometimes green, for two years.

1902: Mount Pelée, on the island of Martinique, smothered the town of Saint-Pierre in deadly gas and hot ash, killing 29,933 of the 29,937 residents.



1980: Mount St. Helens in Washington state blew 1,300 feet off its top, killing 57 people and causing a midday darkness in towns 85 miles away.

1991: After 600 years of dormancy, Mount Pinatubo in the Philippines rumbled for days before erupting and killing about 750 people. Ash was more than 6 feet deep in a two-

mile radius around the volcano, and buried a U.S. air base 15 miles away.

Pinatubo's cloud of sulfuric acid, some 20 million tons of it, climbed to more than 12 miles in the stratosphere. Over the next several weeks, the cloud encircled the equator and spread to the poles, covering the entire planet. The particles reflected sunlight and cooled the Earth by nearly a full degree Fahrenheit.

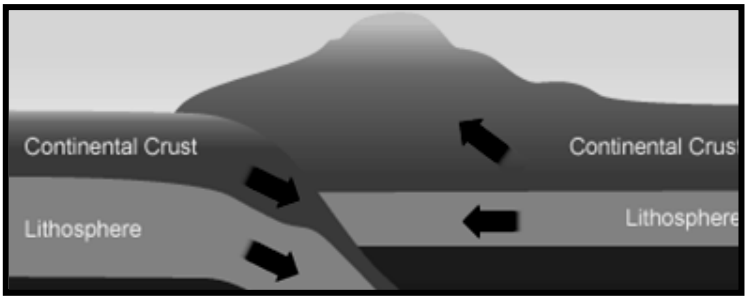
A volcano is a mountain that opens downward to a reservoir of molten rock below the surface of the earth. Unlike most mountains, which are pushed up from below, volcanoes are vents through which molten rock escapes to the earth’s surface.

When pressure from gases within the molten rock becomes too great, an eruption occurs. Eruptions can be quiet or explosive. There may be lava flows, flattened landscapes, poisonous gases, and flying rock and ash that can sometimes travel hundreds of miles downwind.

Because of their intense heat, lava flows are great fire hazards. Lava flows destroy everything in their path, but most move slowly enough that people can move out of the way.

Fresh volcanic ash, made of pulverized rock, can be abrasive, acidic, gritty, gassy and odorous. While not

immediately dangerous to most adults, the acidic gas and ash can cause lung damage to small infants, to older adults and to those suffering from severe respiratory illnesses. Volcanic ash also can damage machinery, including engines and electrical equipment. Ash accumulations mixed with water become heavy and can collapse roofs. Volcanic ash can affect people hundreds of



miles away from the cone of a volcano.

Sideways directed volcanic explosions, known as "lateral blasts," can shoot large pieces of rock at very high speeds for several miles. These explosions can kill by impact, burial or heat. They have been known to knock down entire forests.

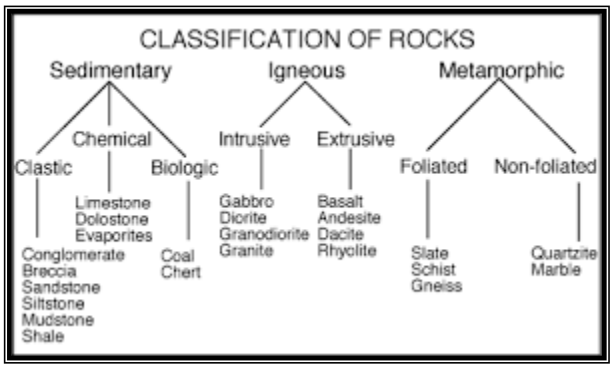
Volcanic eruptions can be accompanied by other natural hazards, including earthquakes, mudflows and flash floods, rock falls and landslides, acid rain, fire, and (under special conditions) tsunamis.

Chapter 3
The Rocks

We learnt that the materials making up crust of the earth are called rocks.

We classify them into four main groups according to the way in which they have been formed.

1- Sedimentary Rocks:



Are those which have been laid down in beds or layers – strata- by wind, running water, or the sea. They are many ways the most important.

Animals or plants may sometimes be buried and their hard parts may remain. When afterwards the sediments are raised by earth- movements into dray land we may find sea-ls, etc.

We can divided sedimentary rocks into three subdivisions:

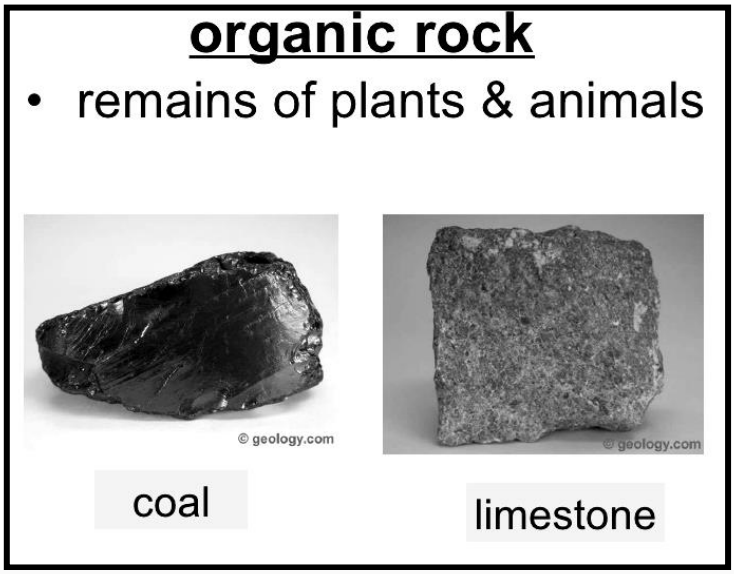
A- Alluvium, which is still being formed by rivers.

B- Young soft rocks:

which have not been subjected to great earthquakes or mountain- building movements. It is in such rocks that oil is found. Examples are clay, shale, and sand.

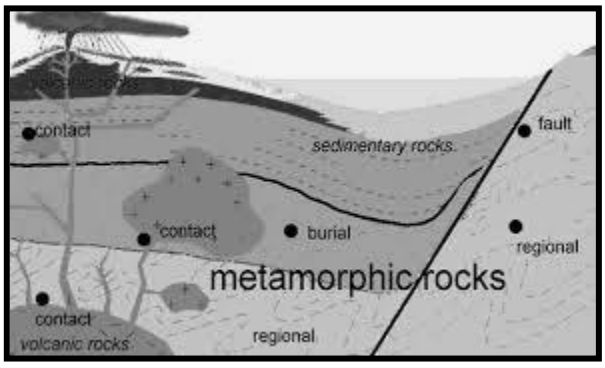
C- old hard rock's:

which have been bent, flooded, and cracked by many



earthquakes and often raised into high mountains.

Even amongst the soft rocks we usually find hard bands which give rise to waterfalls



etc. Sandstone is an example.

2- Organic rocks:

Are rocks formed of the remains of animals or plants. Coal is an organic rock which is formed from the remains of forests which have been submerged and then buried.

Mineral oil has been formed from the remains of animals or plants buried when a river deposited its load of mud in the sea or a lake.

The important point for us to remember in geography is that coal and oil are always found in sedimentary rocks. If we come to a country where the rocks are not sedimentary. It is quite useless to for coal.

Many limestone's are organic rocks because they are built up of the hard parts of animals living in the sea which have extracted of animals living in the sea, which have extracted the calcium bicarbonate from the calcium , Coral is an example.

3.Igneous Rocks:

Which means the rocks are those resulting from the interior heat of the

earth. There are two main kinds:

A- volcanic rocks:

Those which reach the surface in volcanoes . Large area of rocks in Antrim, north east Ireland, and in the Snake River

area of the north- western United states have originated in this way. A common example is basalt

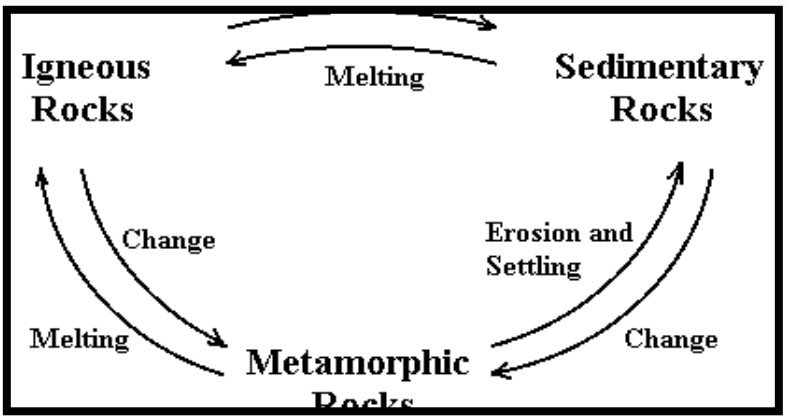
B- Granite :

Those which moved underground but became solid before they reached the surface. We should never be able to see these rocks if it were not for denudation.

A good example of these rocks is granite. Such rocks are usually hard and resist weathering as seen in such granite masses as dart moor or Shape Fell, Cumberland, in England or the Coast Range of British Columbia.

4- Metamorphic Rocks:

which have changed their forts . We have learnt that



earthquakes bend and fold the earth’s crust and gradually build up great mountains. In the process the rocks are hardened and changed.

may be altered by the great heat in the lower part of the earth’s crust. We know that if we take a pike of clay and

bake it, the brick which results is quite different from the clay: this is an excellent example of how heat may alter rocks.

Deep in the earth the rocks may be altered far more and it is almost impossible to tell what the original rock was like. We call such rocks metamorphic or crystalline rocks. It takes a long , long time for to become changed like this, and some of the areas of crystalline rocks were formed ages ago and have remained unchanged ever since.

The central highlands of Scotland form are a good example, whilst the Canadian
Shield is one of the largest areas of such rocks in the world. Metamorphic rocks, like igneous rocks are usually hard and so resist withering .

- Gneiss and Shiest are examples :

Connection between structure rocks, and mineral products, areas of lowland will usually consist of alluvium or of young soft rooks, and so we shall expect oil and coal to be the principal mineral products of such regions.

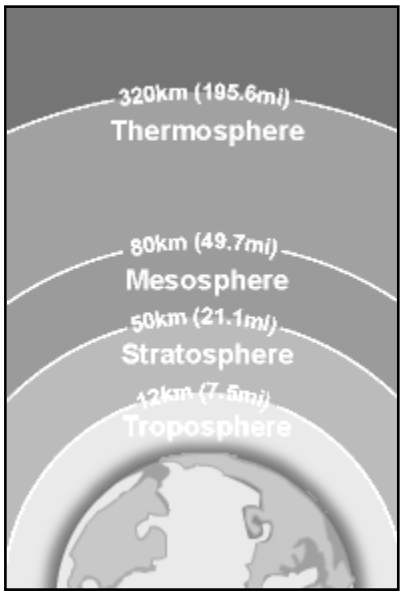
Areas of highland or mountains will usually consist of old hard rocks or igneous or metamorphic rocks, and so we shall expect ores mineral to be the principal products.

Chapter 4
Atmosphere and Climate

Layers of the Atmosphere:

Without our atmosphere, there would be no life on earth. Two gases make up the bulk of the earth's atmosphere: Nitrogen 78% , and Oxygen 21%.

Argon; carbon; Dioxide and various trace gases make up the remainder.



Scientists divided the atmosphere into four layers according to temperature: Troposphere; Stratosphere; Mesosphere; and Thermosphere.

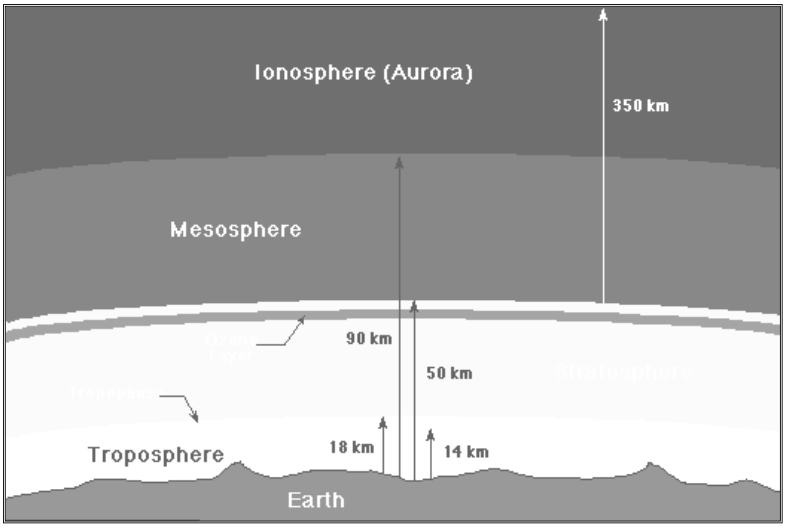
The temperature drops as we go up through the troposphere, but it rises as we move through the next layer)the stratosphere.

The farther away from earth, the thinner the atmosphere gets.

1- Troposphere

This is the layer of the atmosphere closest to the earth's surface, extending up to about 10-15 Km above the earth's surface. It contains 75% of the atmospheres mass.

The troposphere is wider at the equator than at the poles.
Temperature and pressure drops as you go higher up the troposphere.
At the very top of the troposphere where the temperature reaches a stable minimum.
Some scientists call the tropopause a cold trap because this is a point where rising water vapor cannot go higher



because it changes into ice and is trapped.
If there is no cold trap, earth would lose all its water.
The uneven heating of the regions of the troposphere by the Sun causes convection currents and winds. Warm, air from earth's surface rises and cold air above it rushes in to replace it.
When warm air reaches the Troposphere, it cannot go higher as the air above it – in the Stratosphere- is warmer

and lighter preventing much air convection beyond the Tropopause.

The Tropopause acts like an invisible barrier and is the reason why most clouds from and weather phenomena occur within the troposphere.

The Greenhouse Effect: heat from the sun warms the earth's surface but most of it is radiated and sent back into space.

Water vapor and carbon dioxide in the troposphere trap some of this heat, preventing it from escaping thus keep the earth.

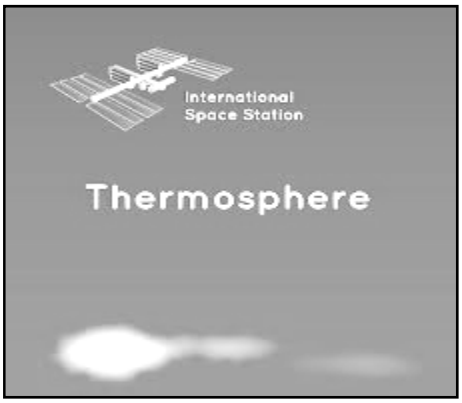
However, if there is too much carbon dioxide in the troposphere then it will trap too much heat. Scientists are afraid that the increasing amounts of carbon dioxide would raise the earth's surface temperature, bringing significant changes to worldwide, weather patterns shifting in climatic zones and the melting of the polar ice caps, which could raise the level of the world's oceans.

2- Stratosphere:

This layer lies directly above the troposphere and is about 35Km deep. It extends from about 15 to 50 Km above the earth's surface

The lower portion of the stratosphere has a nearly constant temperature with height but in the upper portion the temperature increases with altitude because of the absorption of sunlight by ozone. This temperature increase with altitude is the opposite of the situation in the troposphere.

The ozone layer: the stratosphere contains a thin layer of zone which absorbs most of the harmful ultraviolet radiation from the sun. The ozone layer is being depleted, and is getting thinner over Europe, Asia, North American and Antarctica... Holes are appearing in the ozone layer



3- Mesosphere:

Directly above the stratosphere, extending from 50 to 80 Km above the earth's surface, the mesosphere is a cold layer where the temperature generally decreases with increasing altitude.

Here in the mesosphere, the atmosphere is very rarefied nevertheless thick enough to slow down meteors hurtling into the atmosphere, where they burn up, leaving fiery trails in the night sky.

4-Thermosphere:

The thermosphere extends from 80Km above the earth's surface to outer space. The temperature is hot and may be as high as thousands of degrees as the few , molecules That are present in the thermosphere receive extraordinary large amounts of energy from the sun.

However, the thermosphere would actually feel very cold to us because of the probability that these few molecules will hit our skin and transfer enough energy to cause appreciable heat is extremely low.

Composition of the Atmosphere:

Covering the whole of the surface of the earth is the air, or atmosphere. We cannot see it, but we can feel it when it is moving.(wind). If we have a hand we can feel the air against it. In the sale way, if we drop a piece of paper it does not fall straight to the ground because the air prevents it, or as we say, offers resistance.

It is because the air offers resistance that men are able to use airplanes.

The air consists principally of tow gases oxygen and nitrogen. There are about 21 parts of oxygen and 79 parts of nitrogen. Man and nearly all animals must have oxygen, or they cannot live, it is the oxygen we breathe that keep us alive. Just as coffee is not nice to drink unless it has been with sufficient water, so oxygen is too strong by itself, and that is the reason why nitrogen forms a large proportion of the atmosphere.

Thus in the atmosphere there is also a little carbon dioxide. Or carbon acid gas. Now, plant such as trees and grass cannot live without carbon dioxide. They take it in through tiny mouths (stomata) in their leaves and use it to build their bodies, just as we use oxygen to build up our bodies. It is remarkable that what we do not want, the plant do. Too much carbon dioxide in the air will kill a man, yet plants cannot live and grow without it.

Besides oxygen , nitrogen, and carbon dioxide there are small quantities of other gases in the atmosphere, by far the most important is moisture or water vapor.

Pressure of the Atmosphere:

We must picture the earth as a ball surrounded by a coat or envelope of air- the atmosphere. The upper layers are pressing down on the lower layers, so the air there is much

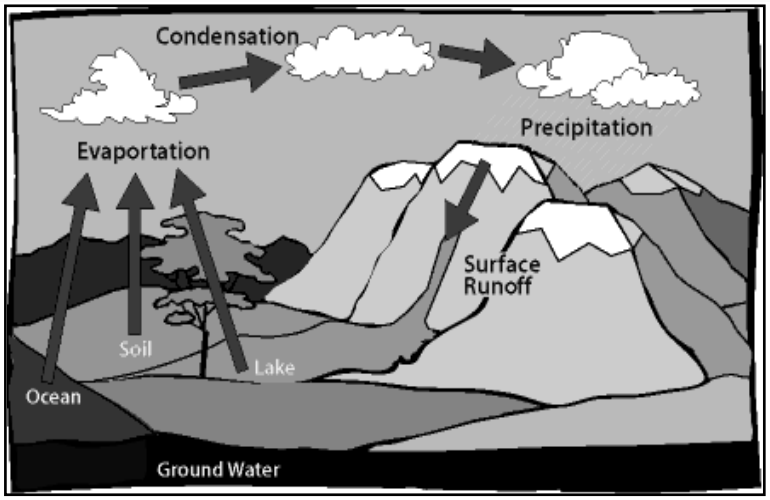
denser and heavier, whilst in the upper layers it is thin or rarefied.

Wherever we may be when we read this, we shall have pressing down upon us a column of air many miles high. Although we do not feel it, this column of air is exerting a pressure equal to 15Ib.

The air pressure at sea-level is affected by several factors:

1- Temperature, heat causes air to expand and become less dense, and so when the temperature is high the pressure is low.

2- Water vapor, air with much water vapor lighter than air



alone. so the pressure is often less in rainy weather when the air is damp.

If there were a uniform ocean over the whole surface of the world there would be certain marked high-pressure belts and certain marked low pressure belts arranged as follows:

A- low-pressure belt round the equator.

The equatorial low pressure belt is caused by the great heat making the air hot and therefore light, and by the large quantity of water vapor, the air is always damp.

B- high-pressure belts just outside the tropics in both North and South hemisphere.

The high-pressure belts, it is reasonable to expect abet of high pressure near the tropics

C- low-pressure regions over the cold regions round the latitudes towards the Africa and Antarctic circles.

The circum, -polar low-pressure areas are caused largely by the rotation of the earth, for the rotation swings the bulk of the air towards the equator.

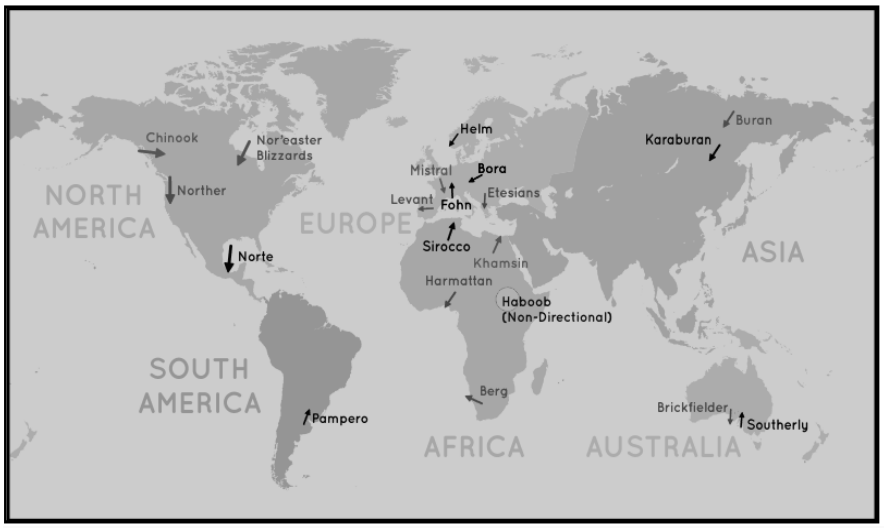
D- High- pressure areas over the poles.

At the poles themselves there are high-pressure centers, probably caused by extreme cold.

Notice the movement of the air in the upper part of the atmosphere. The heated air of the equator rises and flow away pole wards. It becomes cooled and commences to sink towards the earth along the high-pressure belts.

Temperature and Movements of the Atmosphere

Temperature of the atmosphere: The earth's surface obtains



nearly all its heat from the sun. The sun's rays do not heat whole surface of the earth equally. A place directly under the sun gets more heat than a place which is sloping away from the sun. At the equator where the sun is overhead for a greater part of the year, a bundle of sun's rays is only spread over a small area, but near the poles the sun is never overhead ,the sale number of rays is spread over a much larger area. The sun's too , lose some of their heat in passing through the atmosphere. The most important are the maximum temperature and the minimum temperature.

Temperature records must be very carefully kept for each days; each days has its maximum, minimum and mean temperature. In India it is easier for the wind to blow

parallel to the mountain chains than across them. In China the great land mass is to the north-west and the sea to the south-east, so the monsoon blows from the south-east India, Indo-China, China and North-west Australia are the most important monsoon countries, but monsoon winds are also founds in other parts of the world. Notice: The South-East Trade Wind advances across the equator and becomes the South-West Monsoon in India. Local Winds The presence of high mountains, hot desert, etc, often causes winds, which receive special names in different parts of the world. Some like the Sirocco which blows from the Sahara across to Italy, are very hot. Other which blow from the mountains are very cold, sometimes air descending from mountains is warmed by compression and forms the warm Fohn or Chinook winds.

Chapter 5
The Climate of the world

Climate is the long-term pattern of weather in a particular area. Weather is the state of the atmosphere over short periods of time. Weather can change from hour to hour, day to day, month to month or even year to year.

A region's weather patterns, tracked for more than 30 years, are considered its climate.

Climate Conditions:

A region's climate is something like a person's personality. It is usually constant, but there may be surprises. Just as someone with a cheerful attitude will sometimes become sad, an area with a generally mild climate will occasionally experience extreme rainfall or drought. But because climates are mostly constant, living things can adapt to them.

The enormous variety of life on Earth is largely due to the variety of climates that exist and the climate changes that have occurred in the past.

Climate has influenced the development of cultures and civilizations. People everywhere have adapted in various ways to the climates in which they live.

Clothing, for example, is influenced by climate. The warm clothing developed by Eskimo cultures of Asia and North America are necessary for survival in the cold, windy climate near the North Pole. Grass skirts, on the other hand,

are part of many cultures in warm, humid climates, such as Tahiti, an island in the South Pacific Ocean.

Climate also influences where and when a civilization constructs housing or other buildings. The ancient Anasazi people of southern North America built apartments into tall cliffs. The sheltered, shady area kept residents cool in the hot, dry desert climate.

The development of agriculture was very dependent on climate. Ancient agricultural civilizations, such as those in Greece and India, flourished where the climate was mild. Communities could grow crops every season, and experiment with different types of foods and farming techniques.

1-Tropical Climate:

Much of the equatorial belt within the tropical climate zone experiences hot and humid weather. There is abundant rainfall due to the active vertical uplift or convection of air that takes place there, and during certain periods, thunderstorms can occur every day. Nevertheless, this belt still receives considerable sunshine, and with the excessive rainfall, provides ideal growing conditions for luxuriant vegetation. The principal regions with a tropical climate are the Amazon Basin in Brazil, the Congo Basin in West Africa and Indonesia.

Because a substantial part of the Sun's heat is used up in evaporation and rain formation, temperatures in the tropics rarely exceed 35°C; a daytime maximum of 32°C is more common. At night the abundant cloud cover restricts heat loss, and minimum temperatures fall no lower than about 22°C. This high level of temperature is maintained with little variation throughout the year. The seasons, so far as they do exist, are distinguished not as warm and cold periods but by variation of rainfall and cloudiness. Greatest rainfall occurs when the Sun at midday is overhead. On the equator this occurs twice a year in March and September, and consequently there are two wet and two dry seasons.

2- The tropical Climate, or Climate of the Savanna or Tropical Grassland:

This climate is well developed in Africa. As usual, rains follows the sun and so the heaviest rainfall occurs soon after the sun has been shining vertically, whilst the dry seasons occurs in the colder part of the year.

This type of climate is found in the Sudan and Brazil in South America.

3-The Monsoon Climate:

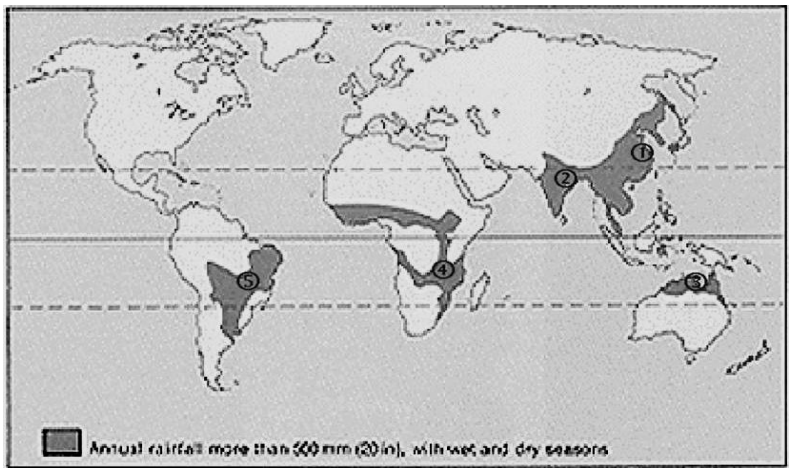
The monsoon Climate is very similar to the Tropical climate, but the rainfall is caused in different way. This

climate occurs around the Indian Ocean, especially in India, Burma, North Western Australia, and Ethiopia in Africa. There are small regions in north western South America which have a monsoon rainfall.

There is the cool season with little rain, lasting in India and Burma from about November to February; then the temperature begins to get higher, and there is the hot season from March to June.

Another name for the Monsoon Climate is the Summer Rains Climate, for the rain falls in the summer of the year.

4- The Climate of the Great Deserts:



Passing from the region of the Tropical or monsoon Climates towards the poles we find regions which are very hot and dry so dry that plants cannot grow.

The trade winds blow away from them towards the poles, and there are no winds which bring rain into the regions.

Some of the regions are dry too , like the centre of Asia, they are very far from the sea.

We may divided these desert into two group:

A- The hot desert, occupying lowlands along the Tropics of Cancer and Capricorn.

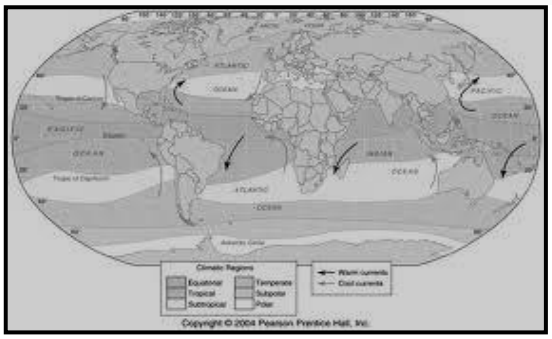
Examples are the Sahara, the desert of Arabia, and the great Indian desert. In the southern Hemisphere there are desert in Australia, south Africa (Kalahari), and south America (Atacama).

B- The Mid-Latitude Desert, usually found on plateaus outside the tropics. They are much colder in the cold season and may be covered with snow. Example are the are the deserts of Iran, and Colorado in North America.

5- Mediterranean Climate:

As the sun moves north and south of the equator during the year, so the main wind belts of the world swing with it. There are parts of the earth between latitudes 30° which in summer are in the northern part of the Trade wind belt, and so are hot and dry like the desert which join them on the side nearer equator.

In winter, however, these regions come under the belt of westerly winds, and so enjoy moist, mild weather. In other words, this is the Winter Rain Climate.

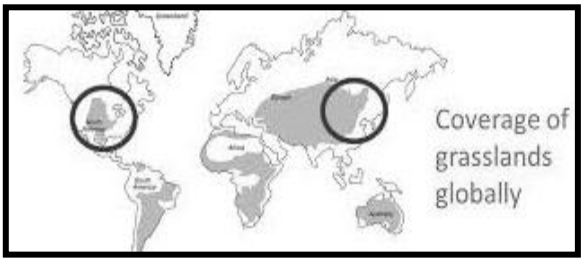


The Mediterranean Climate is so called because it is found all round the
Mediterranean Sea, but it is also found on the western sides of North and South America, South Africa, and South Australia

6- Warm Temperature, East Coast Climate:

The Mediterranean climate is found in region on the western sides of the continents, but on the eastern side just out – side the Tropics, there are sometimes regions having a warm, moist summer and a cold sometimes dry, winter. You will see this is very like the Monsoon climate. China and Eastern Australia are
examples, but there is a very considerable's difference between China, with very cold winters, and the other regions.

7- Cool Temperature, Oceanic Climate:



We come next to those regions which are in the westerly wind belt during the whole year.

They have rain all the year. The winter are cool, and the summer mild. This is the climate of north- western Europe, western Canada, southern Chile. The winter are much colder.

8-Mid- Latitude Continental or Grassland Climate:

The summer are very hot and the winter are very cold – a typical Continental Climate. Rain falls lastly in spring and early summer, but it is not heavy.

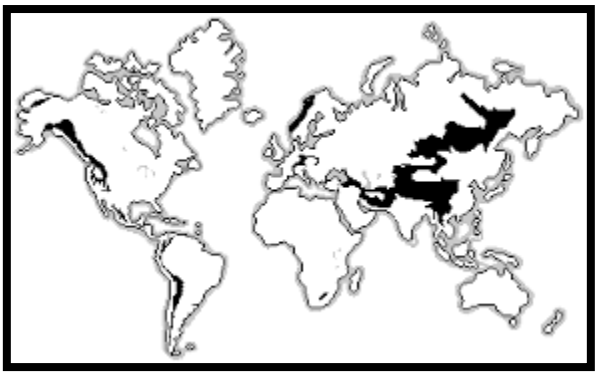
In winter there is a light snowfall . The prairies of North America, the Steppes of south Russia and south Siberia, and south America (Pampas), are a good example of these climate.

9-Cold Temperature Climate:

The cool temperate Ocean climate passes gradually into a colder climate where much of the moisture falls as snow and not as rain. this is the region of colder forests, and

occurs as a great belt across North America, Northern Europe, and Northern Asia.

10- Arctic or Cold Desert Climate:



Here the winters are very long and very cold, and there is only a very short, sharp summer. This climate occurs mainly inside the Arctic and Antarctic circles.

11- Alpine Climate:

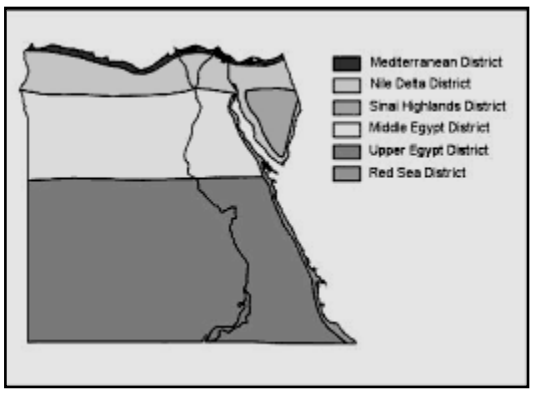
The effect of Climbing up a mountain is very like going a great distance towards the poles. The climate changes as we ascend and gets colder. Near the tops of high mountains it is very cold and there is perpetual snow above the snow-line.

But the climate just below the snow - line is not quite the same as in Arctic or Antracticlands, because on the mountain – top the air is very thin. So we have a special name for the climate found on high mountains the Alpine Climate , named after the great mountain chain of Europe, the Alps

-Climate of Egypt:

The average annual temperature increases moving southward from the Delta to the Sudanese border, where temperatures are similar to those of the open deserts to the east and west. In the north, the cool temperatures of Alexandria during the summer have made the city a popular resort. Throughout the Delta and the northern Nile. Valley, there are occasional winter cold spells accompanied by light frost and even Snow.

At Aswan, in the south, June temperatures can be as low as 10° C at night and as high as 41° C during the day when the sky is clear. Egypt receives fewer than eighty millimeters of precipitation annually in most areas. Most rain falls along the coast, but even the wettest area, around Alexandria receives only about 200 millimeters of precipitation per year. Alexandria has relatively high humidity, but sea breezes help keep the moisture down to a comfortable level.



Moving southward, the amount of precipitation decreases suddenly. Cairo receives a little more than one centimeter

of precipitation each year.

Some areas will go years without rain and then experience sudden downpours that result in flash floods. Sinai receives somewhat more rainfall than the other desert areas, and the region is dotted by numerous wells and oases, which support small population centers that formerly were focal points on trade routes.

Water drainage toward the Mediterranean Sea from the main plateau supplies sufficient moisture to permit some agriculture in the coastal area, particularly near Al Arish.

A phenomenon of Egypt's climate is the hot spring wind that blows across the country. The winds, known to Europeans as the sirocco and to Egyptians as the khamsin, usually arrive in April but occasionally occur in March and May.

-The winds :

form in small but vigorous low-pressure areas in the Isthmus of Suez and sweep across the northern coast of Africa Unobstructed by geographical features, the winds reach high velocities and carry great quantities of sand and dust from the deserts. These sandstorms,

often accompanied by winds of up to 140 kilometers per hour, can cause temperatures to

rise as much as 20° C in two hours.

The winds blow intermittently and may continue for days, cause illness in people and animals, harm crops, and occasionally damage houses and infrastructure.

Climate is the average of the weather. We must be quite sure we understand, what that means, because climate is one of the most important subjects in geography. In Britain there is summer and winter, but rain falls at all seasons of the year. At the same time the summer are never very hot nor the winter very cold.

The countries round the Mediterranean Sea have quite a different type of climate. There the years comprises a short, mild, moist winter, and a long hot dry summer. Every years there are these seasons.

In some years the rain during the winter or rainy season is very abundant, in other years not nearly so much rain falls. But that does not make any difference to the truth of the statement that each year has its west winter and dry summer.

Sometimes we may have a hot day in the midst of the winter, and we can say that the weather for that day is exceptional. But one exceptional day does not alter climate, because the climate refers to the normal or usual condition of the weather.

In the same way as we calculate average rainfall as the average over a number of the years, we can find the average temperature, pressure, humidity, wind direction, and so on these averages for a month, for a season, or for the year- all these average considered together will tell us of the climate. Thus, weather refers to short period such as a day a week, but climate to the normal conditions over many years.

-Dew:

In the early morning the grass and ground rare often quite wet this deposit of water is called dew.

-Fog and Mist:

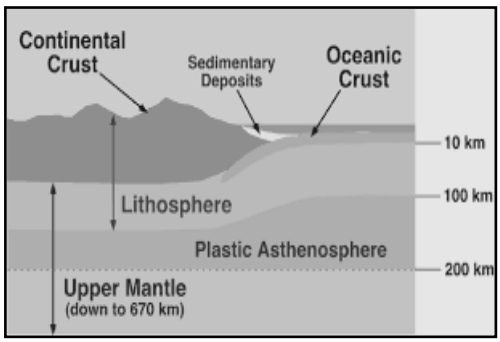
When the water vapor is condensed but remains suspended in the air near the surface of the earth like a cloud, it is called a mist or Fog.

- Precipitation:

This is a general term which includes both rainfall and snowfall as well as hail and sleet.

-Essentials for Rainfall:

In order to have rain two important conditions must be satisfied.

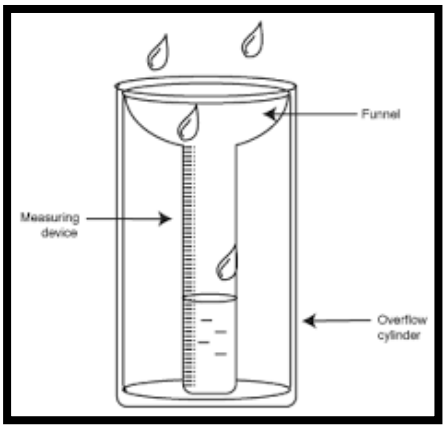


-Rain Shadow:

when a moisture equal laden wind is forced to rise to passé over a mountain range, it must be cooled, and is sure to lose some of its moisture.

-Rain-Gauge:

Rainfall is measured by means of a rain-gauge. All the which falls over a certain small area passes into a funnel, and is collected in a jar where it cannot evaporate and where it can be measured.



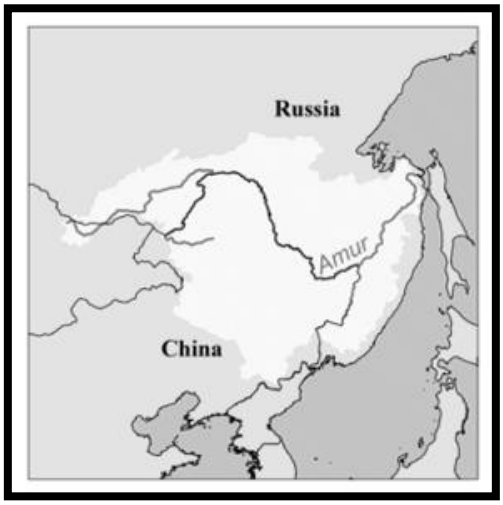
-Rainfall Maps:

On a map of any country we can mark the monthly or yearly averages. Sometimes it is better to use the amount for season, such as the rainy season.

Third

The largest river basins in the world

-Amur River :



"Black River" is the world's tenth longest river, forming the border between the Russian Far East and Northeastern China (Inner Manchuria). The largest fish species in the Amur is the kaluga, attaining a length as great as 5.6 meters (18 ft). The river basin is home to a variety of large predatory fish such as northern snakehead, Amur pike, taxmen, Amur catfish, predatory carp and yellow cheek, as well as the northernmost populations of the Amur soft-shell turtle and Indian lotus.

_The Amazon River:

Amazon River, Portuguese Rio Amazonas, Spanish Río Amazonas, also called Río Marañón and Rio Solimões, the greatest river of South America and the largest drainage system in the world in terms of the volume of its flow and the area of its basin. The total length of the river—as measured from the headwaters of the Ucayali-Apurímac river system in southern Peru—is at least 4,000 miles (6,400 km), which makes it slightly shorter than the Nile

River but still the equivalent of the distance from New York City to Rome. Its westernmost source is high in the Andes Mountains, within 100 miles (160 km) of the Pacific Ocean, and its mouth is in the Atlantic Ocean, on the northeastern coast of Brazil. However, both the length of the Amazon and its ultimate source have been subjects of debate since the mid-20th century, and there are those who claim that the Amazon is actually longer than the Nile. (*See below* The length of the Amazon.)

The vast Amazon basin (Amazonia), the largest lowland in Latin America, has an area of about 2.7 million square miles (7 million square km) and is nearly twice as large as that of the Congo River, the Earth's other great equatorial drainage system. Stretching some 1,725 miles (2,780 km) from north to south at its widest point, the basin includes the greater part of Brazil and Peru, significant parts of Colombia, Ecuador, and Bolivia, and a small area of Venezuela; roughly two-thirds of the Amazon's main stream and by far the largest portion of its basin are within Brazil. The Tocantins-Araguaia catchment area in Pará state covers another 300,000 square miles (777,000 square km). Although considered a part of Amazonia by the Brazilian government and in popular usage, it is technically a separate system. It is estimated that about one-fifth of all

the water that runs off Earth's surface is carried by the Amazon. The flood-stage discharge at the river's mouth is four times that of the Congo and more than 10 times the

amount carried by the Mississippi River. This immense volume of fresh water dilutes the ocean's saltiness for more than 100 miles (160 km) from shore.

The extensive lowland areas bordering the main river and its tributaries, called *várzeas* ("floodplains"), are subject to annual flooding, with consequent soil enrichment; however, most of the vast basin consists of upland, well above the

inundations and known as *terra firme*. More than two-thirds of the basin is covered by an immense rainforest, which grades into dry forest and savanna on the higher northern and southern margins and into montane forest in the Andes to the west. The Amazon Rainforest, which represents about half of the Earth's remaining rainforest, also constitutes its single largest reserve of biological resources.

Since the later decades of the 20th century, the Amazon basin has attracted international attention because human activities have increasingly threatened the equilibrium of the forest's highly complex ecology. Deforestation has accelerated, especially south of the Amazon River and on the piedmont outwash of the Andes, as new highways and air transport facilities have opened the basin to a tidal wave of settlers, corporations, and researchers. Significant mineral discoveries have brought further influxes of population. The ecological consequences of such developments, potentially reaching well beyond the basin and even gaining worldwide importance, have attracted considerable scientific attention (*see* Sidebar: Status of the World's Tropical Forests).

Most of the estimated 1.3 million tons of sediment that the Amazon pours daily into the sea is transported northward

by coastal currents to be deposited along the coasts of northern Brazil and French Guiana. As a consequence, the river is not building a delta. Normally, the effect of the tide is felt as far upstream as Óbidos, Brazil, 600 miles (970 km) from the river's mouth. A tidal bore called the *pororoca* occurs at times in the estuary, prior to spring tides. With an increasing roar, it advances upstream at speeds of 10 to 15 miles (16 to 24 km) per hour, forming a breaking wall of water from 5 to 12 feet (1.5 to 4 meters) high.

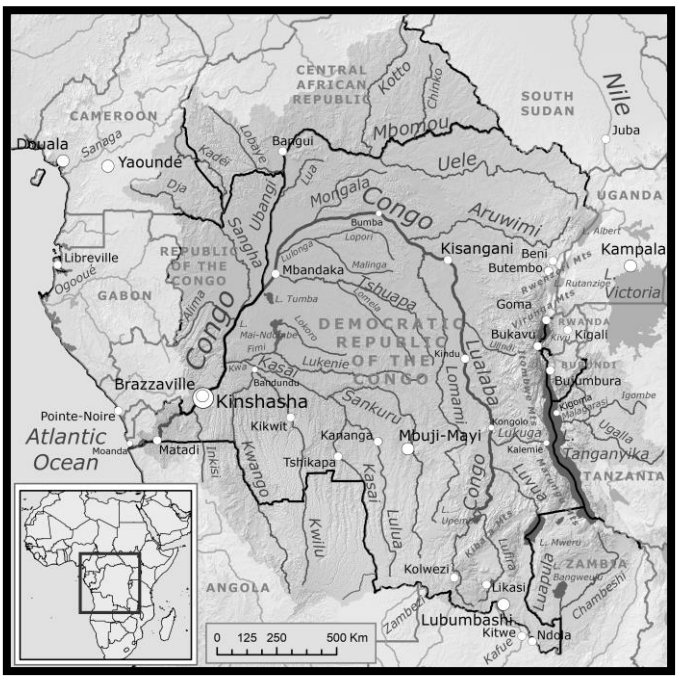
At the Óbidos narrows, the flow of the river has been measured at 7,628,000 cubic feet (216,000 cubic meters) per second; its width is constricted to little more than a mile. Here the average depth of the channel below the mean watermark is more than 200 feet (60 meters), well below sea level; in most of the Brazilian part of the river its depth exceeds 150 feet (45 meters). Its gradient is extraordinarily slight. At the Peruvian border, some 2,000 miles (3,200 km) from the Atlantic, the elevation above sea level is less than 300 feet (90 meters). The maximum free width (without islands) of the river's permanent bed is 8.5 miles (14 km), upstream from the mouth of the Xingu. During great floods, however, when the river completely fills the floodplain, it spreads out in a band some 35 miles

(55 km) wide or more. The average velocity of the Amazon is about 1.5 miles per hour, a speed that increases considerably at flood time.

The rise and fall of the water is controlled by events external to the floodplain. The floods of the Amazon are not disasters but rather distinctive, anticipated events. Their marked regularity and the gradualness of the change in water level are due to the enormous size of the basin, the gentle gradient, and the great temporary storage capacity of both the floodplain and the estuaries of the river's tributaries. The upper course of the Amazon has two annual floods, and the river is subject to the alternate influence of the tributaries that descend from the Peruvian Andes (where rains fall from October to January) and from the Ecuadoran Andes (where rains fall from March to July). This pattern of alternation disappears farther downstream, as the two seasons of high flow gradually merge into a single one. Thus, the rise of the river progresses slowly downstream in a gigantic wave from November to June, and then the waters recede until the end of October. The flood levels can reach from 40 to 50 feet (12 to 15 meters) above low river.

- **The Congo River**;

formerly Zaire River, river in west-central Africa. With a length of 2,900 miles (4,700 km), it is the continent's second longest river, after the Nile. It rises in the highlands of northeastern Zambia between Lakes Tanganyika and Nyasa (Malawi) as the Chambeshi River at an elevation of 5,760 feet (1,760 metres) above sea level and at a distance of about 430 miles (700 km) from the Indian Ocean. Its course then takes the form of a giant counterclockwise arc, flowing to the northwest, west, and southwest before draining into the Atlantic Ocean at Banana



(Banane) in the Democratic Republic of the Congo. Its drainage basin, covering an area of 1,335,000 square miles (3,457,000 square km), takes in almost the entire territory of that country, as well as most of the Republic of the

Congo, the Central African Republic, eastern Zambia, and northern Angola and parts of Cameroon and Tanzania.

With its many tributaries, the Congo forms the continent's largest network of navigable waterways. Navigability, however, is limited by an insurmountable obstacle: a series of 32 cataracts over the river's lower course, including the famous Inga Falls. These cataracts render the Congo unnavigable between the seaport of Matadi, at the head of the Congo estuary, and Malebo Pool, a lakelike expansion of the river. It was on opposite banks of Malebo Pool—which represents the point of departure of inland navigation—that the capitals of the former states of the French Congo and the Belgian Congo were founded: on the left bank Kinshasa (formerly Léopoldville), now the capital of the Democratic Republic of the Congo, and on the right bank Brazzaville, now the capital of the Republic of the Congo.

The Amazon and the Congo are the two great rivers of the world that flow out of equatorial zones where heavy rainfall occurs throughout all or almost all of the year. Upstream from Malebo Pool, the Congo basin receives an average of about 60 inches (1,500 mm) of rain a year, of which more than one-fourth is discharged into the Atlantic. The drainage basin of the Congo is, however, only about

half the size of that of the Amazon, and the Congo's rate of flow—1,450,000 cubic feet (41,000 cubic meters) per second at its mouth—is considerably less than the Amazon's flow of more than 6,180,000 cubic feet (175,000 cubic meters) per second.

The Congo basin is the most clearly distinguished of the various geographic depressions situated between the Sahara to the north, the Atlantic Ocean to the south and west, and the region of the East African lakes to the east. In this basin, a fan-shaped web of tributaries flows downward along concentric slopes that range from 900 to 1,500 feet (275 to 460 meters) in elevation and that enclose a central depression. The basin itself stretches for more than 1,200 miles (1,900 km) from north to south (from the Congo–Lake Chad watershed to the interior plateaus of Angola) and also measures about 1,200 miles from the Atlantic in the west to the Nile-Congo watershed in the east.

The Congo has a regular flow, which is fed by rains throughout the year. At Kinshasa the flow has for many years remained between the high level of 2,310,000 cubic feet (65,000 cubic meters) per second, recorded during the flood of 1908, and the low level of 756,000 cubic feet (21,000 cubic meters) per second, recorded in 1905. During the unusual flood of 1962, however, by far the highest for a

century, the flow probably exceeded 2,600,000 cubic feet (73,000 cubic meters) per second.

At Brazzaville and Kinshasa, the river's regime is characterized by a main maximum at the end of the year and a secondary maximum in May, as well as by a major low level during July and a secondary low level during March and April. In reality, the downstream regime of the Congo represents climatic influence extending over 20° of latitude on both sides of the Equator a distance of some 1,400 miles (2,250 km). Each tributary in its course modifies the level of the main stream. Thus, for example, the low level in July at Malebo Pool results from two factors: a drought that occurs for several months in the southern part of the basin at that time, as well as a delay before the floods of the Ubangi tributary flowing down from the north arrive, which does not happen before August. The Congo basin is so vast that no single meteorologic circumstance is capable of disturbing the slow movement of the waters' rise and fall. The annual fluctuations may alter drastically, however, when floodwaters from different tributaries that normally coincide with each other arrive at different times.

Lake Tanganyika, apart from brief seiches caused by wind drift and sudden changes in atmospheric pressure, may

experience considerable variations in its water level from year to year. In 1960, for example, its waters flooded parts of Kalemi, Democratic Republic of the Congo, and Bujumbura, Burundi. A series of particularly rainy years followed by a blocking of the outlet by floating vegetation may explain this phenomenon.

-**Danube River**:

Danube River, German Donau, Slovak Dunaj, Hungarian Duna, Serbo-Croatian and Bulgarian Dunav, Romanian Dunărea, Ukrainian Dunay, river, the second longest in Europe after the Volga. It rises in the Black Forest mountains of western Germany and flows for some 1,770

miles (2,850 km) to its mouth on the Black Sea. Along its course it passes through 10 countries: Germany, Austria,

Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania, Moldova, and Ukraine.

The Danube played a vital role in the settlement and political evolution of central and southeastern Europe. Its banks, lined with castles and fortresses, formed the boundary between great empires, and its waters served as a vital commercial highway between nations. The river's majesty has long been celebrated in music. The famous waltz *An der schönen, blauen Donau* (1867; *The Blue Danube*), by Johann Strauss the Younger, became the symbol of imperial Vienna. In the 21st century the river has continued its role as an important trade artery. It has been harnessed for hydroelectric power, particularly along the upper courses, and the cities along its banks—including the national capitals of Vienna (Austria), Budapest (Hungary), and Belgrade (Serbia)—have depended upon it for their economic growth.

The Danube's vast drainage of some 315,000 square miles (817,000 square km) includes a variety of natural conditions that affect the origins and the regimes of its watercourses. They favour the formation of a branching, dense, deepwater river network that includes some 300 tributaries, more than 30 of which are navigable. The river basin expands unevenly along its length. It covers about

18,000 square miles (47,000 square km) at the Inn confluence, 81,000 square miles (210,000 square km) after joining with the Drava, and 228,000 square miles (590,000 square km) below the confluences of its most affluent tributaries, the Sava and the Tisza. In the lower course the basin's rate of growth decreases. More than half of the entire Danube basin is drained by its right-bank tributaries, which collect their waters from the Alps and other mountain areas and contribute up to two-thirds of the total river runoff or outfall.

Three sections are discernible in the river's basin. The upper course stretches from its source to the gorge called the Hungarian Gates, in the Austrian Alps and the Western Carpathian Mountains. The middle course runs from the Hungarian Gates Gorge to the Iron Gate in the Southern Romanian Carpathians. The lower course flows from the Iron Gate to the deltalike estuary at the Black Sea.

The different physical features of the river basin affect the amount of water runoff in its three sections. In the upper Danube the runoff corresponds to that of the Alpine tributaries, where the maximum occurs in June when melting of snow and ice in the Alps is the most intensive. Runoff drops to its lowest point during the winter months.

In the middle basin the phases last up to four months, with two runoff peaks in June and April. The June peak stems from that of the upper course, reaching its maximum 10 to 15 days later. The April peak is local. It is caused by the addition of waters from the melting snow in the plains and from the early spring rains of the lowland and the low mountains of the area. Rainfall is important. The period of low water begins in October and reflects the dry spells of summer and autumn that are characteristic of the low plains. In the lower basin all Alpine traits disappear completely from the river regime. The runoff maximum occurs in April, and the low point extends to September and October.

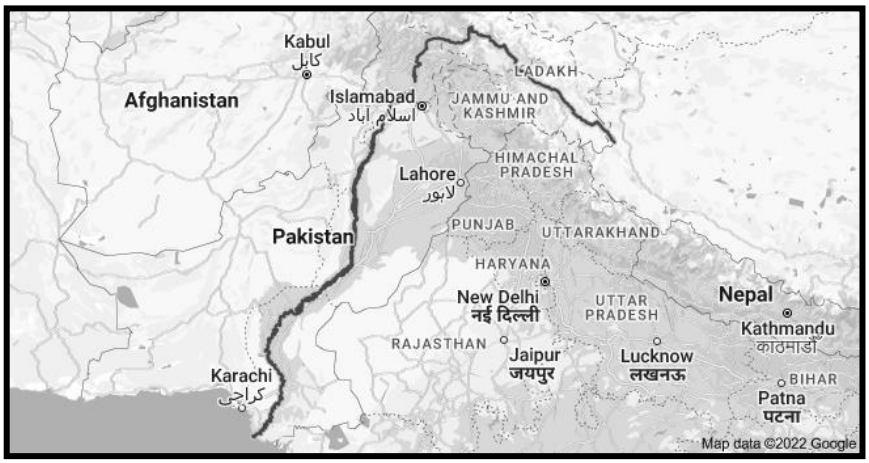
The river carries considerable quantities of solid particles, nearly all of which consist of quartz grains. The constant shift of deposits in different parts of the riverbed forms shoals. In the stretches between Bratislava and Komárno and in the Sulina Channel, draglines are constantly at work to maintain the depth needed for navigation. The damming of the river has also changed the way in which sediments are transported and deposited. Water impounded by reservoirs generally loses its silt load, and the water flowing out of the dam—which is relatively silt-free—erodes banks farther downstream.

The temperature of the river waters depends on the climate of the various parts of the basin. In the upper course, where the summer waters derive from the Alpine snow and glaciers, the water temperature is low. In the middle and lower reaches, summer temperatures vary between 71 and 75 °F (22 and 24 °C), while winter temperatures near the banks and on the surface drop below freezing. Upstream from Linz the Danube never freezes entirely, because the current is turbulent. The middle and lower courses, however, become icebound during severe winters. Between December and March, periods of ice drift combine with the spring thaw, causing floating ice blocks to accumulate at the river islands, jamming the river's course, and often creating major floods.

The natural regime of river runoff changes constantly as a result of the introduction of stream-regulating equipment, including dams and dikes. The mineral content of the river is greater during the winter than the summer. The content of organic matter is relatively low, but pollution increases as the waters flow past industrial areas. The river's chemistry also changes as city sewerage and agricultural runoff find their way into the river.

Indus River:

One of the longest rivers in the world, the Indus has long been a vital feature of the land now covered by India and Pakistan. The Indus Valley was the site of one of the world's earliest civilizations. The



hymns of ancient India speak of the river, which is the source of the country's name.

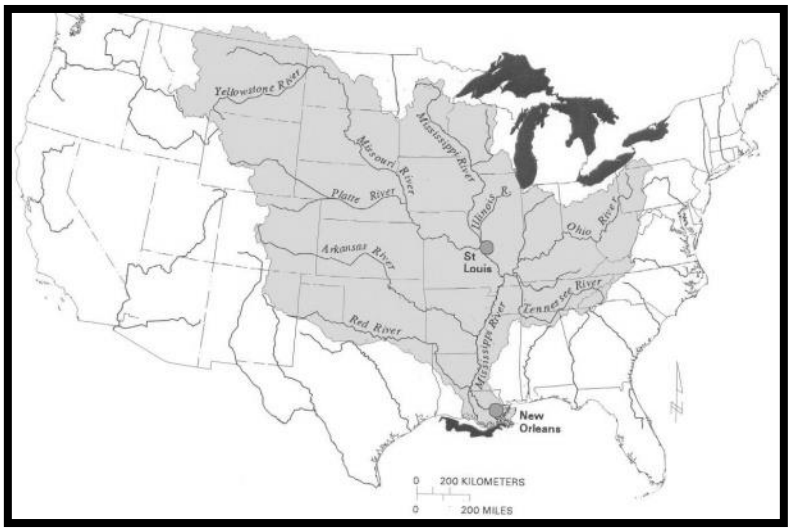
The Indus River is about 1,800 miles (2,900 kilometers) long. It starts high in the Himalayas in the Tibet region of China. For about 500 miles (800 kilometers) the Indus flows through some of the world's tallest mountains. It passes through northwestern India, the territory of Kashmir, and northern Pakistan. Much of the river's water comes from the melting of glaciers and snow in the mountains. After leaving the mountains the Indus flows onto the plains of Pakistan. In the region called Punjab, several rivers

empty into the Indus and make it much wider. The Indus empties into the Arabian Sea.

The Indus is very important to the economy of the region through which it flows. Although much of the land is very dry, farming is possible because river water is used for irrigation. The main crops grown in the region are sugarcane, wheat, rice, and cotton. Fish caught in the river include hilsa and trout. The shallow area where the river empties into the sea has a lot of shrimp.

- **The Mississippi River:**

is the second-longest river and chief river of the second-



largest drainage system on the North American continent, second only to the Hudson Bay drainage system

Its source is Lake Itasca in northern Minnesota and it flows generally south for 2,320 miles (3,730 km) to the

Mississippi River Delta in the Gulf of Mexico. With its many tributaries, the Mississippi's watershed drains all or parts of 32 U.S. states and two Canadian provinces between the Rocky and Appalachian mountains. The main stem is entirely within the United States; the total drainage basin is 1,151,000 sq mi (2,980,000 km2), of which only about one percent is in Canada. The Mississippi ranks as the fourth-

longest and fifteenth-largest river by discharge in the world. The river either borders or passes through the states of Minnesota, Wisconsin, Iowa, Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana.

The Mississippi River is the second longest river in North America, flowing 2,350 miles from its source at Lake Itasca through the center of the continental United States to the Gulf of Mexico. The Missouri River, a tributary of the Mississippi River, is about 100 miles longer. Some describe the Mississippi River as being the third longest river system in the world, if the length of Missouri and Ohio Rivers are added to the Mississippi's main stem. When compared to other world rivers, the Mississippi-Missouri River combination ranks fourth in length (3,710 miles/5,970km) following the Nile (4,160 miles/6,693km), the Amazon (4,000 miles/6,436km), and the Yangtze Rivers (3,964 miles/6,378km). At a rivers delta, the reported length may increase or decrease as deposition and erosion occurs.

As a result, different lengths may be reported depending upon the year or measurement method. The staff of Itasca State Park at the Mississippi's headwaters suggest the main stem of the river is 2,552 miles long. The US Geologic Survey has published a number of 2,300 miles, the EPA says it is 2,320 miles long, and the Mississippi National River and Recreation Area suggests the river's length is 2,350 miles.

Another way to measure the size of a river is by the amount of water it discharges. Using this measure the Mississippi

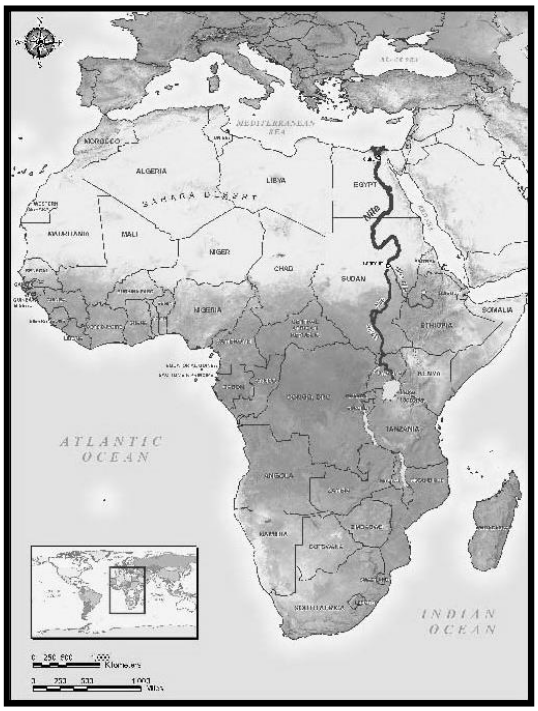
River is the 15th largest river in the world discharging 16,792 cubic meters (593,003 cubic feet) of water per second into the Gulf of Mexico. The biggest river by discharge volume is the Amazon at an impressive 209,000 cubic meters (7,380,765 cubic feet) per second. The Amazon drains a rainforest while the Mississippi drains much of the area between the Appalachian and Rocky Mountains, much of which is fairly dry.

At Lake Itasca, the average flow rate is 6 cubic feet per second. At Upper St. Anthony Falls in Minneapolis, the northern most Lock and Dam, the average flow rate is 12,000 cubic feet per second or 89,869 gallons per second. At New Orleans, the average flow rate is 600,000 cubic feet per second.

- Nile River:

Arabic Baḥr Al-Nīl or Nahr Al-Nīl, the longest river in the world, called the father of African rivers. It rises south of the Equator and flows northward through northeastern Africa to drain into the Mediterranean Sea.

The word "Nile" comes from the Greek word *Neilos*, meaning river valley. In the ancient Egyptian language, the Nile is called *iteru*, meaning "great river," represented by the hieroglyphs shown on the right.



The Nile is one of the world's great waterways, at 4,180 miles (6,695 kilometers) generally regarded as the longest river in the world and among the most culturally significant natural formations in human history. Flowing northward from remote sources in the mountains of Ethiopia and central Africa and draining into the Mediterranean Sea, the Nile has flooded seasonally over millennia to provide life-giving fertile soils and irrigation for Egypt's people. The drainage basin of the Nile encompasses about 10 percent of the area of Africa

Like the Tigris and Euphrates rivers in Mesopotamia in modern Iraq, the Nile provided a hospitable environment

for the emergence of one of the earliest and most dominant civilizations in history. The river and its annual inundations played an important role in ancient Egyptian religion and cosmology. Most of the population of Egypt since ancient times and all its cities except those near the coast lie along those parts of the Nile valley north of Aswan, and nearly all the cultural and historical sites of ancient Egypt are found along its banks.

In modern times, the ten nations in the Nile Basin face perhaps their greatest challenge as they confront escalating demands for water, economic opportunities, and hydroelectric power. Pressed by their growing populations and water needs and projected drops in water flow as a result of climate change, all ten Nile basin countries have joined in a 1999 accord "to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources." The ability to transcend national boundaries for the benefit of the greater cause is a necessary step not only in the care and sustenance of the Nile and its peoples, but also in the

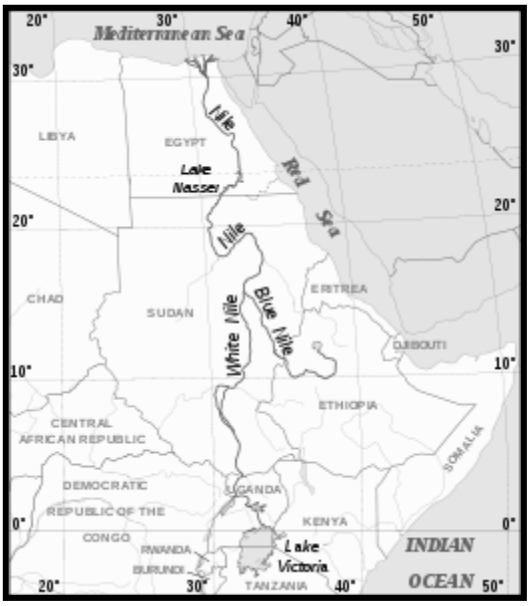
preservation and stewardship of the earth's natural resources in the face of unprecedented social and environmental challenges in the twenty-first century.

It puzzled the ancients why the amount of water flowing down the Nile in Egypt varied so much over the course of a year, particularly because almost no rain fell there. Today we have hydrographic information that explains why the Nile is a "summer river."

The Nile south of the Great Bend in Sudan is really two hydraulic regimes: The White Nile maintains a constant flow over the year, because its flow is doubly buffered. Seasonal variations are moderated by the water stored in the Central African lakes of Victoria and Albert and by evaporation losses in the Sudd, the world's largest freshwater swamp. The Sudd reduces annual variations in stream flow since in unusually

wet years, the area of the Sudd increases, which leads to larger losses to evaporation than during dry years, when the area of the Sudd is reduced. The result is that the White Nile issuing from the Sudd flows at about the same rate all year long, keeping the Nile downstream from Khartoum flowing during the winter months, when the Blue Nile/Atbara system has dried up.

The Blue Nile/Atbara system is a completely different hydraulic regime. It responds to the wet season/dry season variation of the Ethiopian highlands. In the winter, when little rain falls in the highlands, these rivers dry up. In the summer, moist winds from the Indian Ocean cool as they climb up the Ethiopian highlands, bringing torrential rains that fill the dry washes and canyons with rushing water that ultimately joins the Blue Nile or the Atbara. During the summer, the White Nile's contribution is insignificant. The annual flood in Egypt is a gift of the annual monsoon in Ethiopia.



After Aswan, there is less water due to evaporation of the Nile's waters during its leisurely passage through the Sahara Desert. Water is also lost due to human usage, so that progressively less water flows in the Nile from Atbara, the Nile's last tributary, all the way to the Mediterranean Sea.

Before the placement of dams on the river, peak flows would occur during late August and early September and minimum flows would occur during late April and early May.

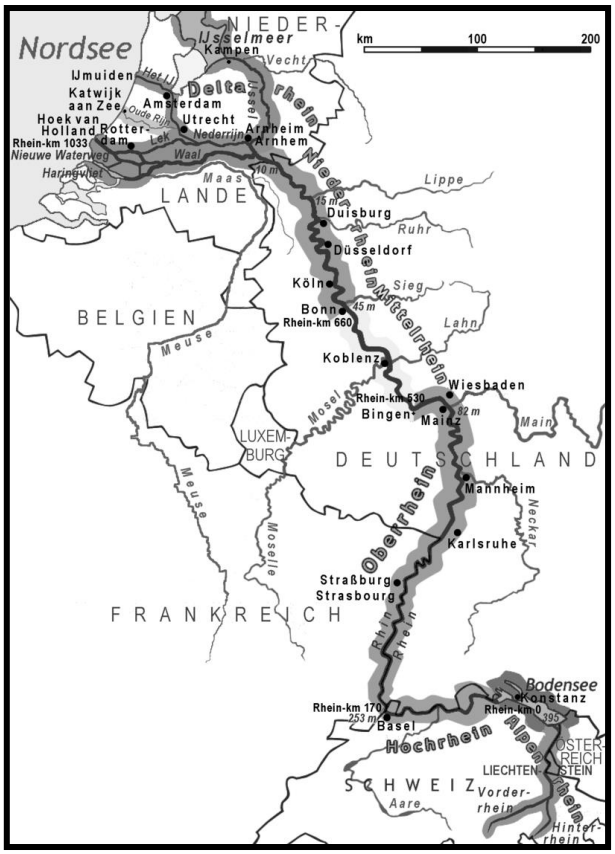
-Rhine River:

The Rhine is one of the major European rivers. The river begins in the Swiss canton of Graubünden in the southeastern Swiss Alps. It forms part of the Swiss-Liechtenstein, Swiss-Austrian, Swiss-German borders. After that the Rhine defines much of the Franco-German border, after which it flows in a mostly northerly direction through the German Rhineland. Finally in Germany the Rhine turns into a predominantly westerly direction and flows into the Netherlands where it eventually empties into the North Sea.

It is the second-longest river in Central and Western Europe (after the Danube), at about 1,230 km (760 mi),

with an average discharge of about 2,900 m^3/s (100,000 cu ft/s).

The Rhine and the Danube comprised much of the Roman Empire's northern inland boundary, and the Rhine has been a vital navigable waterway bringing trade and goods deep inland since those days. The various castles and defenses built along it attest to its prominence as a waterway in the Holy Roman Empire. Among the largest and most important cities on the Rhine are Cologne, Rotterdam, Düsseldorf, Duisburg, Strasbourg, Nijmegen, and Basel.



The length of the Rhine is conventionally measured in "Rhine-kilometers" (*Rheinkilometer*), a scale introduced in 1939 which runs from the Old Rhine Bridge at Constance (0 km) to Hook of Holland (1036.20 km).

The river is significantly shortened from its natural course due to a number of canalization projects completed in the 19th and 20th century. The "total length of the Rhine", to the inclusion of Lake Constance and the Alpine Rhine is more difficult to measure objectively; it was cited as 1,232 kilometers (766 miles) by the Dutch Rijkswaterstaat in 2010.

-Volga River;

Russian **Volga,** ancient (Greek) **Ra** or (Tatar) **Itil** or **Etil**, river of Europe, the continent's longest, and the principal waterway of western Russia and the historic cradle of the Russian state. Its basin, sprawling across about two-fifths of the European part of Russia, contains almost half of the entire population of the Russian Republic. The Volga's immense economic, cultural, and historic importance—along with the sheer size of the river and its basin—ranks it among the world's great rivers.

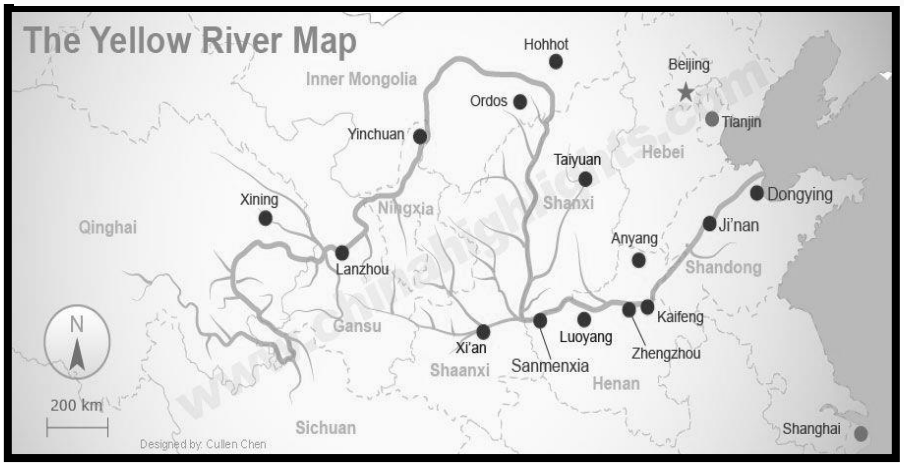
Rising in the Valdai Hills northwest of Moscow, the Volga discharges into the Caspian Sea, some 2,193 miles (3,530 kilometers) to the south. It drops slowly and majestically from its source 748 feet (228 meters) above sea level to its mouth 92 feet below sea level. In the process the Volga receives the water of some 200 tributaries, the majority of which join the river on its left bank. Its river system, comprising 151,000 rivers and permanent and intermittent streams, has a total length of about 357,000 miles.

The river basin drains some 533,000 square miles (1,380,000 square kilometers), stretching from the Valdai Hills and Central Russian Upland in the west to the Ural Mountains in the east and narrowing sharply at Saratov in the south. From Kamyshin the river flows to its mouth uninterrupted by tributaries for some 400 miles. Four geographic zones lie within the Volga basin: the dense, marshy forest, which extends from the river's upper reaches to Nizhny Novgorod (formerly Gorky) and Kazan; the forest steppe extending from there to Samara (formerly Kuybyshev) and Saratov; the steppe from there to Volgograd; and semi desert lowlands southeast to the Caspian Sea.

The Volga is fed by snow (which accounts for 60 percent of its annual discharge), underground water (30 percent),

and rainwater (10 percent). The natural, untamed regime of the river was characterized by high spring floods (*polovodye*). Before it was regulated by reservoirs, annual fluctuations in level ranged from 23 to 36 feet on the upper Volga, from 39 to 46 feet on the middle Volga, and from 10 to 49 feet on the lower Volga. At Tver the average annual rate of river flow is about 6,400 cubic feet (180 cubic meters) per second, at Yaroslavl 39,000 cubic feet per second, at Samara 272,500 cubic feet per second, and at the river's mouth 284,500 cubic feet per second. Below Volgograd the river loses about 2 percent of its waters in evaporation. More than 90 percent of annual runoff occurs above the confluence of the Kama

-**Yellow River** or **Huang He:**



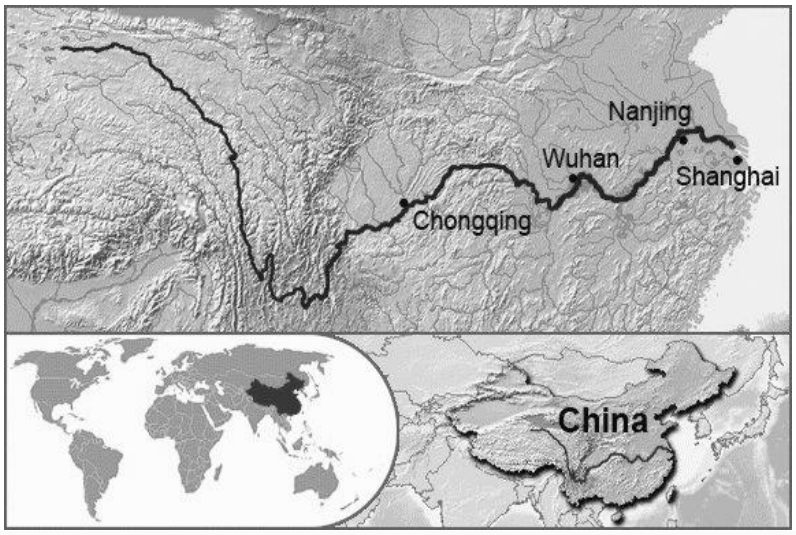
(second longest river in China, after the Yangtze River, and the sixth longest river system in the world at the estimated length of 5,464 km. Originating in the Bayan Har

Mountains in Qinghai province of Western China, it flows through nine provinces, and it empties into the Bohai Sea near the city of Dongying in Shandong province. The Yellow River basin has an east–west extent of about 1,900 kilometers (1,180 mi) and a north–south extent of about 1,100 km. Its total drainage area is about 752,546 square kilometers.

Its basin was the birthplace of ancient Chinese civilization, and it was the most prosperous region in early Chinese history. There are frequent devastating floods and course changes produced by the continual elevation of the river bed, sometimes above the level of its surrounding farm fields.

- **Yangtze River** or **Yangzi** :

is



the longest river in Asia, the third-longest in the world and the longest in the world to flow entirely within one country.

It rises in the northern part of the Tibetan Plateau and flows 6,300 km (3,900 mi) in a generally easterly direction to the East China Sea. It is the sixth-largest river by discharge volume in the world. Its drainage basin comprises one-fifth of the land area of China, and is home to nearly one-third of the country's population.

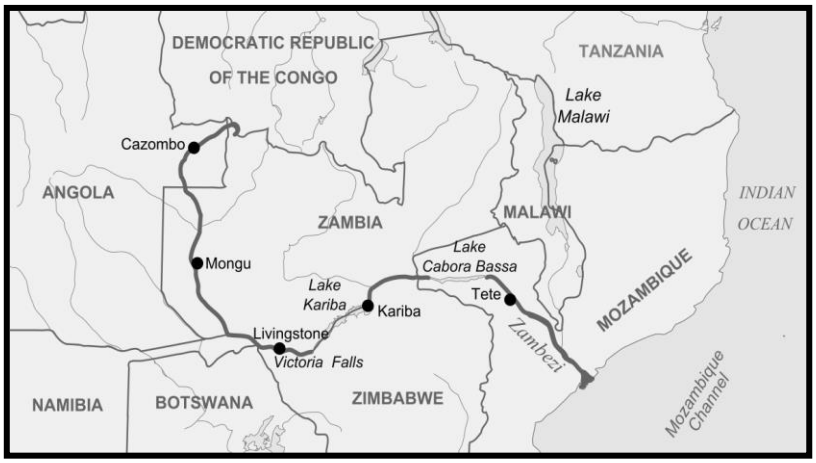
The Yangtze has played a major role in the history, culture and economy of China. For thousands of years, the river has been used for water, irrigation, sanitation, transportation, industry, boundary-marking and war. The prosperous Yangtze River Delta generates as much as 20% of the PRC's GDP. The Three Gorges Dam on the Yangtze is the largest hydro-electric power station in the world.

In mid-2014, the Chinese government announced it was building a multi-tier transport network, comprising railways, roads and airports, to create a new economic belt alongside the river.

- Zambezi River:

also spelled **Zambezi**, river draining a large portion of south-central Africa. Together with its tributaries, it forms the fourth largest river basin of the continent. The river flows eastward for about 2,200 miles (3,540 kilometers) from its source on the Central African Plateau to empty into the Indian Ocean. With its tributaries, it drains an area of

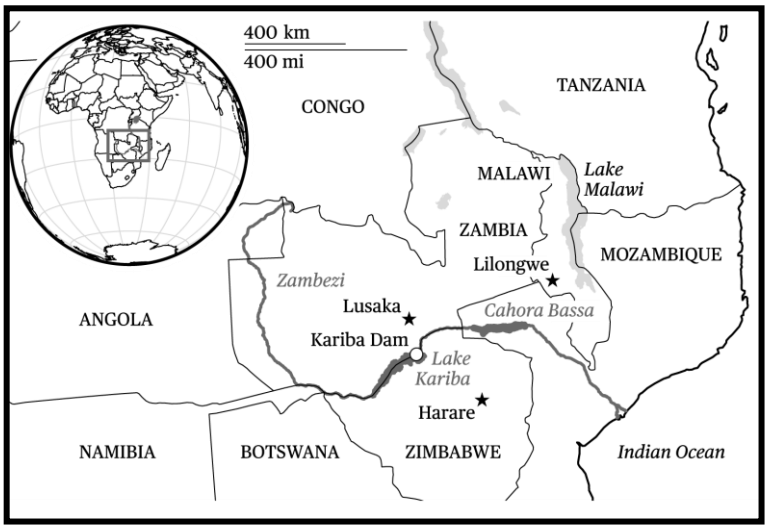
more than 500,000 square miles (1,300,000 square



kilometers). The Zambezi (meaning "Great River" in the language of the Tonga people) includes along its course the Victoria Falls, one of the world's greatest natural wonders, and the Kariba and Cahora Bassa dams, two of Africa's largest hydroelectric projects. The river either crosses or forms the boundaries of six countries—Angola, Zambia, Namibia, Botswana, Zimbabwe, and Mozambique—and the use of its waters has been the subject of a series of international agreements.

The Zambezi then enters a stretch of rapids that extends from Ngonye (Sioma) Falls south to the Katima Mulilo Rapids, after which for about 80 miles it forms the border between Zambia to the north and the eastern Caprivi Strip—an extension of Namibia—to the south. In this stretch the river meanders through the broad grasslands of the Sesheke Plain until it is joined by the Cuando

(Kwando) River. Near Kazungula, Zambia, the river, after flowing past Botswana territory to the south, turns almost due east and forms the



frontier between Zambia and Zimbabwe. From the Cuando confluence to the Victoria Falls, the Zambezi varies considerably in width, from open reaches with sand islands to stretches of rapids through narrow channels separated by numerous rock islands.

The Zambezi, according to measurements taken at Maramba (formerly Livingstone), Zambia, experiences its maximum flow in March or April. In October or November the discharge diminishes to less than 10 percent of the maximum. The annual average flow reaches about 247,000 cubic feet (7,000 cubic meters) per second. Measurements taken at Kariba Dam reflect the same seasonal pattern; the highest flood recorded there was in March 1958, when the flow reached 565,000 cubic feet per second.