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ANALYSING THE CHARACTERISTICS OF MAJOR BRANCHES OF MODERN GEOGRAPHY

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ABSTRACT

Geography can be described as a field of science which is the study of the Earth's physical features, people, as well as the relationships between people and their environment. Based on collecting and analyzing materials from various sources, the paper analyze the characteristics of major branches in the new trend of geography. In addition, as a basis for the above analysis, we also outline the history of geography and present the traditional and modern methods in geographical research.

Keywords: branches of geography, history of geography, methods in geographical research, geography.

TÓM TẮT

Phân tích đặc điểm các nhánh nghiên cứu chính của địa lí học hiện đại

Địa lí học được miêu tả là một ngành khoa học, nghiên cứu về đặc điểm tự nhiên trên bề mặt Trái Đất, nghiên cứu về con người cũng như mối quan hệ giữa con người với môi trường sinh sống của họ. Trên cơ sở thu thập và phân tích dữ liệu từ các nguồn tài liệu khác nhau, bài báo phân tích đặc điểm các phân ngành chính của địa lí học trong xu thế hiện nay. Ngoài ra, để làm cơ sở cho việc phân tích trên, chúng tôi cũng khái quát lịch sử ngành địa lí học, trình bày các phương pháp nghiên cứu truyền thống và hiện đại được sử dụng trong nghiên cứu địa lí.

Từ khóa: sự phân ngành của địa lí học, lịch sử địa lí học, phương pháp nghiên cứu địa lí, địa lí học.

1. Introduction

The science of geography is likely the oldest of all sciences, "it was born much earlier than physics, chemistry, biology and many other sciences" (Oishimaya, 2017). The term "geography" was invented by the ancient Greek scholar Eratosthenes and literally means "writing about the earth" or "description of the earth". The word can be divided into two parts - *geo* and *graphy*. "*Geo*" means the Earth and "*graphy*" refers to writing. Some people said that the term "geography" may came from the French word "geographie" or the Latin "geographia" (Oishimaya, 2017). Of course, geography today means much more than writing about the Earth because it has spent thousands of years to accumulate knowledge.

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The purpose of geography is to step by step take images of the Earth's surface on the map and describe objects such as mountains, rivers, lakes, lagoons, etc. Throughout the long history of development, geography has changed the purpose and content of research. However, geography was not recognized as a formal science until the 18th century, although many scholars had undertaken geographical scholarship for much longer, particularly through cartography.

In recent years, with the development of technology (especially geographic information systems and remote sensing), geography has changed and become a highly applied science which solves reality problems. Today, it has also become a highly interdisciplinary science which studies not only the Earth's physical features but also the relationships between people and their environments.

In this paper, we analyze the characteristics of geographical branches in the trend of integration, globalization. In addition, as a basis for the above analysis, we also outline the history of geography and present the modern methods in geographical research.

2. Content

2.1. Definition of geography

Previously, many famous geographers have attempted to define the science in a few short words. Most of them believe that geography is a field of study that deals with maps, but this definition is only partially correct. The concept of geography has also changed throughout the ages, making a definition for such a dynamic and all-encompassing subject difficult. With the help of various sources, the definition of geography has been elucidated. Here are some of the general definition of geography:

- The worldatlas defines: 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"(Oishimaya, 2017).
- National Geographic Society: Geography is the study of places and the relationships between people and their environments. Geographers explore both the physical properties of Earth's surface and the human societies spread across it" (National Geographic Society, 2017).
- According to the Association of American Geographers: Geography is the science of place and space. Geographers ask where things are located on the surface of the earth, why they are located where they are, how places differ from one another, and how people interact with the environment. Geographers also study the linkages between human activity and natural systems" (AAG Career Guide, 2016).

Although there are different ways of expressing, all of these definitions show that geography is a field of science devoted to the study of natural and human constructed phenomena relative to a spatial dimension. Therefore, the main areas in geographical

research are the spatial analysis of natural and human phenomena, area studies, study of man-land relationship, and research in earth sciences.

2.2. History of Geography

Some of the first truly geographical studies occurred more than four thousand years ago. The main purpose of these early investigations was to map features and places observed as explorers traveled to new lands. "The earliest evidence of such explorations comes from the archaeological discovery of a Babylonian clay tablet map that dates back to 2300 BC" (Pidwirny et al*,* 2006).

However, 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. One of the first Greek geographers was Herodotus (484 - 425 BC). Herodotus wrote a number of volumes that described the human and physical geography of the various regions of the Persian Empire. The ancient Greeks were also interested in the form, size, and geometry of the Earth. Aristotle (384 - 322 BC) hypothesized and scientifically demonstrated that the Earth had a spherical shape. Eratosthenes (276 - 194 BC) is the first person who use simple geometric relationships to calculate the equatorial circumference.This primitive calculation was rather accurate. Of course, the Greeks were not the only people interested in geography. Throughout human history, most societies have sought to understand something about their place in the world, and the people and environments around them. The Romans also made several important studies to geographical knowledge. Strabo (64 BC - 20 AD) wrote a 17 volume series called "Geographia" (National Geographic Society, 2017). In his series of books, Strabo describes the cultural geographies of the various societies of people found from Britain to as far east as India, and south to Ethiopia and as far north as Iceland.

During the Middle Ages, geography ceased to be a major academic pursuit in Europe. Advances in geography were chiefly made by scientists of the Muslim world. They created the world's first rectangular map based on a grid, a map system that is still familiar today. Islamic scientist also applied their study of people and places to agriculture, determining which crops and livestock were most suited to specific habitats or environments.

In addition to the advances in the Middle East, the Chinese civilization also contributed instrumentally towards the development of early geography. They were the first to use the compass for navigational purposes which was used by the Chinese explorers to explore the unknown.

Through the 13th century travels of the Italian explorer Marco Polo, a new historical chapter of geography opened. A fresh interest in geography was regenerated in the European world. They moved ahead in all directions, discovering new lands, unique

cultures, and natural wonders in the process. The period of time between the 15th and 17th centuries is known in the West as the "Age of Discovery" (Aughton & Peter, 2009), many new lands were discovered and accounts by European explorers such as "Christopher Columbus, Vasco da Gama, Ferdinand Magellan, and James Cook" (Aughton & Peter, 2009).

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. Today, geography also became an important part of other academic disciplines, such as chemistry, economics, and philosophy. The strong interdisciplinary links between geography and others sciences have also grown greatly, especially as a "result of earth system science that seeks to understand the world in a holistic view" (Pidwirny et al*,* 2006).

2.3. The Branches of Geography

Geography can be regarded as an interdisciplinary science. The geography can be divided into the two major branches of study: *physical geography* and *human geography (*AAG Career Guide, 2006). The former examines the natural environment, and how organisms, climate, soil, water, and landforms produce and interact. The latter largely focuses on the built environment and how humans create, view, manage, and influence space.

Other key areas of geography include *regional geography* (which involves the in-depth study and knowledge of a particular region and its cultural as well as its physical characteristics), *geomatics* (geographic technologies such as geographic information systems, remote sensing, GPS), and *integrated geography* (which shows the relationship between human geography and physical geography; human and environment).

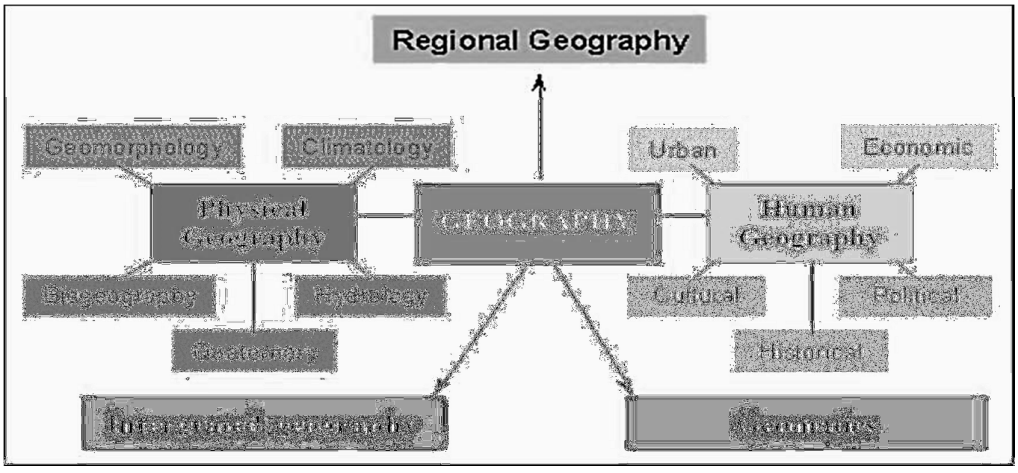

Figure 1. *The relationships between geography and the branches of geography*

(Assignment Help, 2017)

2.3.1. Physical Geography

Physical geography is one of the two major branches of geography. 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 (Pidwirny et al, 2006). Physical geography may be further subdivided into various branches: geomorphology, climatology, hydrology, biogeography, pedology, meteorology, oceanography, glaciology, landscape ecology, environmental geography, etc.

Table 1. *The sub-fields of study in physical geography*

Fields	The content and phenomena studied
Geomorphology	the study of landforms on the Earth and the processes by which it is shaped.
Climatology	the science that studies Earth's climate system (including local and global climate) and its impact on Earth's surface.
Hydrology	the study of Earth's water in all its forms, properties, distribution, and effects.
Biogeography	the science that studies the spatial relationships of plants and animals and the impact of the environment on the distribution of plants and animals
Pedology	the science that studies the different soils on the Earth's surface and how it is created, changed, and classified.
Meteorology	the study of the weather patterns of a place and the atmospheric processes and phenomena that influence the weather
Oceanography	the science that studies Earth's oceans and seas, including geological, biological, chemical, and physical oceanography
Glaciology	the study of the inter-dynamics of glaciers and their effects on the planet's environment.
Landscape ecology	the study of how the varying landscapes on Earth influences the ecological processes and ecosystems on the planet
Environmental geography	the science that studies the spatial aspects of interactions between humans and the natural world

In the trend of integration and globalization, research about the physical landscapes of the planet is important for physical geographers because the natural processes of the earth affect the distribution of resources, the conditions of human settlement, and have resulted in a plethora of varied impacts to human populations.

2.3.2. Human Geography

Human geography is the branch of geography that deals with the study of people and their communities, cultures, economies and interactions with the environment by studying their relations with and across space and place (Johnston et al, 2000). Human geography differs from physical geography mainly in that it has a greater focus on studying human activities and is more receptive to qualitative research methodologies. Broadly speaking, human geography is a social science, while physical geography is an earth science. Human

geography is concerned with the study of spatial patterns of interactions between human beings and their physical environment.

This branch of geography can be further subdivided into various disciplines based on the focus of study: urban geography, economic geography, cultural geography, political geography, social geography, population geography, ect.

Table 2. *The sub-fields of study in human geography*

Fields	The content and phenomena studied
Cultural geography	the science that studies how and why cultural products and norms vary with space and place
Economic geography	the study of how human economic activities are located, distributed and organized in geographical place and space
Population geography	the study of ways in which spatial variations in the distribution, composition, migration, and growth of populations which are related to their environment or location.
Political geography	the science that studies the political boundaries of the countries of the world and the division of land and its resources between the countries
Development geography	the science that explores the quality of life and the standard of living of the human inhabitants and attempts to understand how and why such standards vary with place and space
Urban geography	the study of areas consisting of cities, towns, and places of similar high concentration of infrastructure
Settlement geography	the study of the urban and rural settlements, and the dynamics of human settlement patterns in relation to space and time.
Health geography	the science that studies the influence of the geographical location and place on the health and well-being of humans.
Historical geography	study of the geographies of the past and how a place or region changes through time

Globalization is also becoming increasingly important to the field of human geography as it is allowing these specific aspects of culture to easily travel across the globe. It links culture to the physical environments in which people live to make *cultural landscapes.*

Today, human geography is still practiced and more specialized fields within it such as feminist geography, children's geography, tourism studies, urban geography, the geography of sexuality and space, and political geography have developed to further aid in the study of cultural practices and human activities as they relate spatially to the world.

2.3.3. Regional geography

Regional geography is a new branch of geography that studies the world's regions. A region itself is defined as a part of the Earth's surface with one or many similar characteristics that make it unique from other areas. Regional geography studies the specific unique characteristics of places related to their culture, economy, topography, climate, politics and environmental factors such as their different species of flora and fauna.

Regional geography began to develop in the United States specifically and parts of Europe in the period between World Wars I and II. Then, geography became a regional science concerned with why certain places are similar or different and what enables people to separate one region from another. This practice became known as areal differentiation. However, it was later critiqued for its specifically regional knowledge and it was claimed to have been too descriptive and not quantitative enough.

Today, regional geography has seen a resurgence as a major branch of geography. The main fields of study in regional geography focus around the core fields, such as analysing and explaining regional differences; testing general theories in the regional context; developping policies for particular regions; solving problems in specific places.

2.3.4. Integrated Geography

Integrated geography is also called environmental geography or human environment geography. It is the new branch of geography which describe and explain the spatial aspect of interaction between human individuals and societies and their natural environment (Noel Castree et al, 2009).

The branch bridges the divide between human and physical geography and thus requires an understanding of the dynamics of geology, meteorology, hydrology, biogeography, and geomorphology, as well as the ways in which human societies conceptualize the environment.

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 the environmental geography include: emergency management, environmental management, sustainability, and political ecology.

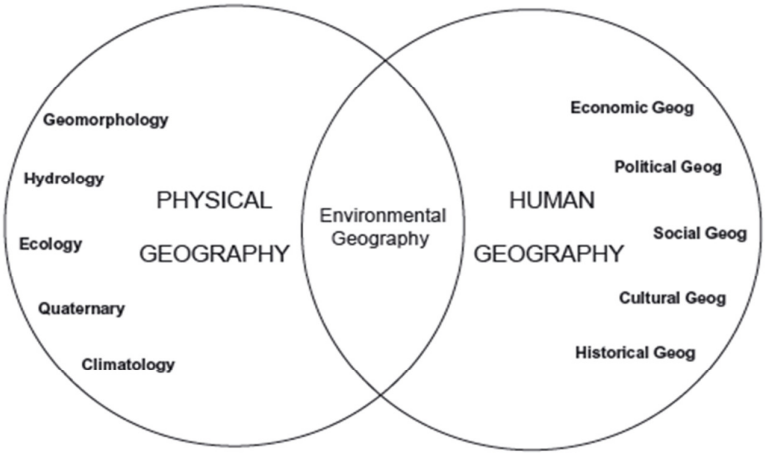

Figure 2. *Environmental geography - the links between human and physical geography (Pidwirny et al, 2006).*

2.3.5. Geomatics

Geomatics is concerned with the application of computers to the traditional spatial techniques used in cartography and topography. Geomatics emerged from the quantitative revolution in geography in the mid 1950s. Today, geomatics methods include spatial analysis, geographic information systems, remote sensing, and GPS.

Application areas of geomatic in geography include: meteorology, oceanography, resource management and environment, land management and reform, urban and regional planning, subdivision planning, natural resource monitoring and development, climate change, coastal zone management and mapping, disaster informatics for disaster risk reduction and response, etc.

2.4. Methods of geography

2.4.1. Traditional methods of geography

Mapping methods are widely used in geography research, including physical geography and human geography. There is hardly any geographic study that does not use the map, it is used as references, research tools, or research results. The subdisciplines of geography rely on maps for presenting their analyses. Therefore, the map is considered "special languages in geography". For example, geographer use topographic map with a variety of symbols to describe both natural and human made features such as roads, buildings, quarries, lakes, streams, and vegetation.

Field survey method aims to collect materials and verify the results of the study in the field. Geographers will visit a place to gather information by observing and measuring. In addition, to find out what people think about a certain place, geographers will sometimes have to talk to a carefully chosen sample of people, whose answers represent the group. It is the most meaningful method in geographic research because actual data and actual verification will make the results of the research have more scientific and more persuasive.

Analyzing Statistics method: Geographers use numerical information that is organized and analyze it to find patterns and trends. An example is using census data to learn about a population. There are two ways of analyzing geographic statistics:

- *Quantitative Analyzing* are used to analyze and identify regularities in data, specifically the application of statistical methodology to the exploration of geographic phenomena. It is used extensively in a variety of fields, including hydrology, geology, petroleum exploration, weather analysis, urban planning, logistics, and epidemiology. Applications of quantitative data analysis rely heavily on geographic information systems. Currenly, geographers are making notable contributions to the method of quantitative techniques.

- *Qualitative Analyzing* approaches can be found throughout the various subdisciplines. In qualitative work, research material is also sought in a variety of other

ways throught interviewing, observating, interacting with residents. Then, all of the scientific researches are done through the medium of written language. In cultural geography there is a tradition of employing qualitative research techniques, also used in anthropology and sociology.

2.4.1. Modern methods of geography

Geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. GIS has revolutionized the field of cartography, nearly all mapmaking is now done with the assistance of some forms of GIS software. With the use of GIS, multiple layers of data may be displayed in one map. In addition, GIS applications are tools that allow users to create interactive queries, analyze spatial information, edit data in maps, and present the results of all these operations (Clarke, 1986). This key characteristic of GIS has begun to open new avenues of scientific geography.

Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object. Remote sensing is used in numerous fields of geography, including land surveying, hydrology, ecology, oceanography, glaciology, geology; it also has military, commercial, economic, planning, and humanitarian applications (Giacomo Capizzi et al, 2016). Geographers increasingly use remotely sensed data to obtain information about the Earth's land surface, ocean, and atmosphere, because it supplies objective information at a variety of spatial scales; provides a synoptic view of the area of interest; facilitates studies of how features/areas change over time. Today, geography research depend on advanced technological tools like satellites and computers.

3. Conclusion

Being as an popular science, geography has experienced a long period of accumulation of knowledge. In the process of development, geography has changed a lot about the object, purpose and content of research. At present, geography is no longer a single science, but it is a system of sciences that are interconnected each other. It is a combination of many different sub-sciences that have a distinct function but are simultaneously united by a common function.

In addition, whether geography is thought of as a science or as a basic feature of our world, developing an understanding of the subject is important. Some grasp of geography is essential as people seek to make sense of the world and understand their place in it. Thinking geographically helps people to be aware of the connections among and between places and to see how important events are shaped by where they take place. Finally, knowing something about geography enriches people’s lives; promoting curiosity about other people and places and an appreciation of the patterns, environments, and people that make up the endlessly fascinating, varied planet on which we live.

- ***Conflict of Interest:*** *Authors have no conflict of interest to declare.*

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