

Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant)

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The Renaissance with its inventions, discoveries and revolutions brought about in the art of map making brought a renewed interest in the geographical knowledge and removed some misconceptions. Geographers began to ask question: how things observed could be related to some generalizations of the empirical perception (James & Martin, 1981, 89).

The pre-classical period of geography witnessed the emergence of dichotomy and dualisms which has either being regarded as the justification for the role of geography or has been argued as the basis for division of the subject. The Germans made significant contribution in geography with their concepts, models and paradigms. Notable among them were -

- idea of a heliocentric universe by Polish scholar Nicolaus Copernicus.

- Laws of motion by German astronomer by Johannes Kepler in 1618
- Recognition of the idea of heliocentric universe of Copernicus by Galileo in 1623
- Laws of gravitation by Issac Newton in 1686
- Peter Apian's recognition of the Aristotelian concept of the ekumene or the zone of habitability in 1524
- Sebastian Münster's 'Cosmographia Universalis' which was published in 1544 excludes mathematical and physical geography and gave emphasis on history and genealogical tables.
- Cluverius (Phillip Cluver), the German geographer carried forward the historical tradition of Sebastian Münster and produced universal geography. In his book 'Introduction in Universam Geographiam', published posthumously in 1624, made a distinction between geography and chorography.

Bernhard Varenius (1622-1650)

Bernhard Varen, known as Varenius was born in a village near Hamburg in Germany in 1622. He studied philosophy, mathematics and physics in the University of Hamburg. He went to the University of Königsberg to study medicine. He published his book entitled 'Descriptio neogræcorum et Siam' in 1649 which consists of five parts:

- i) a description of Japan
- ii) a translated description of Siam in Latin.
- iii) an essay on religions of Japan.
- iv) informations on religion of in Africa.
- v) a short essay on government — dealing with places and people.

He was the first scholar to identify the difference between physical and human geography. He was of the view that the methods of the natural sciences could be used to draw ~~precisions~~ conclusions with greater precision for natural phenomena including climate, geology and landforms, but it cannot be applied to social and cultural phenomena.

Varenus brought for the first time the contemporary knowledge of astronomy and cartography. He was the first to point out the difference in the amount of heat received from the sun in the equatorial regions as compared with that in the higher latitudes. He was of the view that the sun's heat thins the air close to the equator and therefore, the cold heavy air of the poles must flow towards the equator. This is viewed as the first step towards the explanation of the world's wind systems.

Varenus divided geography into 'Special Geography' and 'General Geography' which were indeed first used by Bartholomew Keckermann in his lecture in 1603 and then in his book in 1617. According to Varenus, special

geography has greater practical importance for government and commerce but it leaves out the fundamentals, ~~but to be~~ of this field of study; and general geography provides these fundamentals, but to be of maximum utility they must be applied. Special geography primarily describes individual countries and world regions. Special geography and general geography latter paved way for regional and systematic geography.

John Ray (1627-1705) is credited with the development of systematic study of botany and provided an empirical classification of plants. He also pointed out that water running down the slopes could wear away the mountains.

John Strachey (1719) explained how landforms reflect the underlying structure.

Domenico Guglielmini studied the laws of river flow.

Louis Gabriel Comte de Bosc of France in 1786 proved mathematically the equilibrium between velocity and the load of alluvium carried by the flowing water of a river.

The Scottish geologist, James Hutton pioneered the concept of geomorphic processes shaping the surface of the earth resulting into the evolution of landforms.

Johann Rheinhold Forster and his son Johann George Forster pioneered empirical explanation and approached geography from a practical viewpoint.

Immanuel Kant (1724-1804)

Immanuel Kant was born in 1724 in East Prussia. He was interested in physical geography and to him the study of geography was an approach to empirical knowledge necessary for his philosophical consideration. His interest in the field of physical geography rose through his investigation of the whole field of empirical knowledge and not a result of the actual experience of the variety of nature in different parts of the earth. He devoted much of his time in organizing materials for problems such as, the deflection of wind direction resulting from the rotation of the earth. Kant is often referred to as an arm chair geographer and his contribution is more philosophical.

In his early works 'Critique of Pure Reason' (1781), he rejected the teleological idea of final cause and emphasized on the explanations. Physical geography according to him is a relationship between natural processes and the races of man and the changes on the earth due to human action. His concept of man as an agent is borrowed from Comte de Buffon's 'Histoire Naturelle'.

According to Kant, physical geography is the first part of knowledge of the world and the most essential for understanding of our perception of the world. Knowledge as of him can be either (i) pure reason or the (ii) senses. Sense can be perceived either by (i) inner sense

i.e. Soul (Seele) or Man (Mensch) and the outer sense i.e. Nature. Anthropology studies the Soul or Man, and physical geography studies Nature.

Kant's concept of nature of geography and its place within the sciences gives rise to major disagreements. He considered knowledge can be classified in two ways —

i) Logical classification which classifies items according to similarities of morphological features and gives rise to systematic sciences as zoology, geology, sociology.

ii) Physical classification which classifies items belonging to time and space. Here, he pointed out that History differs from geography in time and space. History is narrative and is a report of phenomena that follow one another (nacheinander) and geography is descriptive and is a report of phenomena that follow each other (nebeneinander).

Kant is regarded as the "father of exceptionalism" and opposed explanations and generalizations required in spatial science.

In 19th Century in Germany, Neo-Kantianism emerged and simultaneously there emerged a distinction between cultural or historical sciences ~~and~~ which deals with an intelligible world of 'non-sensuous object of experience' which have to be understood and the natural sciences which deals with the sensible world of science. These two distinctions latter developed into

i) Idiographic or empirical approach emphasising the description of particular groupings of nations and people in terms of lands, seas, countries and places.

ii) Nomothetic or deductive approach which seeks to establish theories relevant to the location and interrelation of places and to establish laws and make deductions on the basis of laws.

Kant introduced other branches of geography, ~~which~~ which he defined as:

1.) Mathematical Geography: "which treats of the form, size and movement of earth, and of the position of in the solar system."

2.) Moral Geography - "which discuss the different customs and characters of men i.e. examine the contrast of Oriental civilisations where parricide is a most fearful crime, with customs in Lapland where a father, if wounded while hunting, expects his son to kill him."

3.) Political Geography - "the study of the relationship between political units and their physical background. For example, in ancient Persia two states

existed whose mutual ~~inter~~ independence arose from, and was assumed, by the Kermes desert which divided them."

4.) Commercial Geography — "which examines the reasons why certain countries have a superfluity of one commodity while others have a deficiency, a condition that gives rise to international trade."

5.) Theological Geography — "which studies the changes theological principles undergo in different environments (Boden). For example, one would make a comparison of the form of Christianity in the Far East with that of Europe, and of the variation of Christian beliefs in different parts of Europe."

Kant's concept of a chronological science that which studies things which are mutually coordinated, not subordinated, in space, gave rise to the Possibilism of French School of Human geography and to modern humanistic geography. After Kant's death, his philosophy was reviewed by Heltnier and Hartsbourne. Kant considered man as a principal agent affecting changes on the earth. Indeed, Kant's 'Physical geography', both in purpose and in content, might be considered as 'anthropocentric', a point of view which latter Ritter inherited from Kant.

References: —

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Early Origin of Geographical Thinking with Reference
to Varenus and Kant — Chandreyi Banerjee

Dualism and Dichotomies (General Vs. Particular, Physical Vs Human, Regional Vs Systematic, Determinism Vs. Possibilism, Idiographic Vs. Nomothetic).

Geographers throughout the history of the discipline have been confronted with the methodological problem of dualism and dichotomy. In the pre-history period of geography an obscure and vague dualism can be found in the writings of Greek, Romans and Arab geographers. During the post-renaissance period in Europe the dualistic thinking in geography became more conspicuous. Since then, geography have been divisible into a number of mutually exclusive branches. These dichotomies or branching of the subject look quite logical. Some prominent dichotomies are:—

General Vs Particular

Varenius in the 17th Century, which is considered as the Classical-period of the modern geographical thought recognised the two main divisions of geography — general or universal and special or particular. General geography as viewed by Varenius was concerned with the formulation of the general laws, principles and generic concepts. It was considered as the end of scientific enquiry in the initial development of geography. In brief, general geography deals with the whole world as a unit, and was restricted to the

physical geography which could be understood through natural laws. On the contrary, special geography was primarily intended as a description of individual countries and world regions. It was difficult to establish laws in special geography where human-beings are involved, the behaviour of whom is always unpredictable. The special geography helped in the formulation of hypothesis and structured ideas.

Physical Geography vs. Human Geography

Greeks were the first to start this branching of the discipline. Herodotus gave weightage to physical geography, and, Herodotus and Strabo emphasised on the human aspect. Physical geography studies natural phenomena such as climatology, meteorology, hydrology, oceanography, geology and landforms where it is possible to use the methods of natural science and draw conclusions with a lot of scientific precision. The methods of natural sciences does not suits the study of social and cultural phenomena. The study of human geography must be limited to time and space and must relate to statements of probability rather than certainty. Kant delivered lectures on physical geography and he studied the deflection of wind direction resulting from earth's rotation. Humboldt was interested in

physical geography. Carl Ritter was more inclined towards human geography. Carl Ritter and Ratzel were the first to consider man as an agent for changing landscape. However, it was Vidal de la Blache who founded the school of human geography. Jean Brunhes and Albert Demangeon was also strong advocate of human geography.

It is often considered that the dichotomy of physical geography vs. human geography is artificial and illogical. Dualism is the result of historical development of the discipline. Geography does not fall into two groups (physical and human); but these two are just the two extremes of continuum. According to Hartshorne the division of geography into physical and human phenomena makes the rest of the work illogical. Thus, geography study the effect of physical factors on man and man's activities on land and not the physiological factor. Thus, the cause of division of geography is only partial study.

Regional Vs Systematic

Humboldt in his book 'Kosmos' recognised the dualism of systematic ~~or~~ vs. regional geography. Humboldt and Ritter were inspired by the overriding concern for the universal

in the post-renaissance contemporary science. The contemporary science in astronomy and physical sciences are characterised by the proliferation of universally applicable laws. Humboldt was engaged in the development of systematic physical geography, and, Ritter was giving weightage to man as an important component of the physical surroundings as a regional geographer. Ferdinand von Richthofen emphasised that regional geography must be descriptive to ~~describe~~ highlight the features of the region. He also emphasized that it should try to seek regularities of occurrences and patterns of unique features to formulate hypotheses to explain the observed characteristics.

The systematic geography is essentially analytical and use generic concepts, whereas regional geography is synthetic and deals with unique situations and their peculiarities. Systematic geography deals with the whole world as a unit, and studies the patterns of distribution of temperature, rainfall, vegetation, minerals, crops and population, at the world level or continent-wise. In regional geography, we study the landforms climatic variables, soils, vegetation, minerals, flora and fauna and superimpose the physical factors on the cultural landscape or any other ~~of the physical~~ of the elements of socio-cultural aspect. The dichotomy of systematic versus regional geography is quite logical.

Determinism Vs. Possibilism

The philosophy of determinism can be traced back to the classical antiquity as its mention can be found in the writings of Herodotus, Hippocrates, Crotos thenes, Strabo. The branching of geography into deterministic and possibilistic has its roots in the middle of the 19th Century. Geography has always been connected with philosophical, especially since the time of Kant (1724 - 1804). Humboldt and Ritter were concerned with determinism. Humboldt in 'Kosmos' studied the relationships between the physical and intellectual world. The essence of the deterministic philosophy is that the history, culture, activities of man, his lifestyle and the cultural landscape of a social group, tribe or nation are entirely dependent on the physical factors of environment.

The philosophy of possibilism believes that nature does not ~~drive~~ ~~man~~ drive man along a particular road, but it offers a number of opportunities from among which man is free to select. Vidal de la Blache, the founder of philosophy of possibilism, opines the *genres de vie* (the life styles) are the products and reflections of civilization, represented by the integrated result of physical, historical and social influences surrounding man's relation to milieu in particular places. According to him, the differences in the lifestyle of people living under almost identical environmental conditions

are not because of the dictates of physical environment but owing to the variation in attitudes, values and habits. Febvre, Vidal, ~~Bowen~~ Bowman and Sauer were opposed to possibilism. Jean Brunhes in his book 'Human Geography' emphasised the possibilistic philosophy of geography.

Lefebvre has shown that determinism and possibilism are not different approaches but are just the two extremes of a continuum, and so, the dualism of determinist geography vs. possibilist geography is false and illogical. These studies are not mutually exclusive. Man is inevitably influenced by his ~~environment~~ ~~social~~ ~~physical~~ environment but nowhere completely and nowhere is entirely free.

Idiographic vs. Nomothetic

Alfred Hettner, the German scholar viewed geography to be an idiographic science. This subject of geography was the knowledge of the earth's areas as they differ from each other. He included man as the integral part of nature of an area. His approach was deductive giving more weightage to the elements of physical environment.

Vidal de la Blache discarded the deductive approach and revived the inductive method and empirical research, and extensively employed specific studies for drawing conclusions of a general nature.

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