Is Geography a Science? The first requirement of science is accurate observation and a careful record. The second is search for explanations. The third is to gain, if possible, the power of prediction. In the application of this general agreement about scientific purpose, there is no absolute or infallible right-versus-wrong way of producing scientific work. It is as true of geography or astronomy as of economics that the data of the subject may be divided into two distinct groups: (1) facts capable of rather rigid scientific treatment to meet the requirements indicated above, and (2) facts that represent the illogicalities and waywardness of man's own mind, his changing spirit, and his equally changeful points of view.

A given science is a point of view, a method of research, and a specific, ...which implies limited... group of facts. Geography, like other sciences, applies definite methods of study to certain groups of systematically collected facts in the attempt to recognize significances and possibly to identify rational relationships, for example, of area to area, or of cause to effect. In other words, though geography appears weak in theory, it does generalise, but in ways relevant to its own problems and shares the discovery of relationships with other sciences.

One of the broader scientific generalizations employed by geography is that the general environment does not represent a haphazard grouping of conditions but a grouping in response to law. Many of the facts of geography have a physical explanation, and the subject is concerned with both
rule of occurrence and specific expression of regions and their effects. Forecast is the test of the so-called laws in science. Geographic science attempts to help recognize and trace the action of some of the recurrent social and economic elements or forces that have physical relationships.

Thus, in the light of the above, geography is a science only when the units of its subject-matter are articulated for a purpose. Facts concerning the present crust of the earth should be studied not as an end in themselves, but as data which explain organic adaption. Surface, soil, temperature and rainfall, are to be considered individually as conditions and causes which control organic responses.

Even in ancient and medieval times, there were thinkers who speculated regarding cause and effect processes, made attempts to measure things, and to place them on maps. It was Thales, for example, who, as early as the sixth century, indicated the five principal climatic zones and who thus brought a variety of facts into a rational order essentially the same as that employed by us today. The writings of Herodotus, about 400 B.C. show that he realized that event and environment must be considered in relation to one another if one is to understand the significance of the affairs of a people or a nation. Like Pythagoras before him, Herodotus used the field-survey method to seek detailed first-hand knowledge of the regions that he undertook to describe.

These early creative thinkers had what we now call the scientific spirit.
In gathering facts about the earth as such, and as a dwelling place for mankind, they looked for significances, provided a rational order for arrangement, and drew generalisations that are now called scientific laws or principles.

It has been said that geography as a science rather than a mere description of lands and peoples began with Eratosthenes (c. 200 B.C.) when he measured the round earth instead of talking about its roundness, and at the same time set up a 'system' respecting diverse geographical data. He worked out his ideas through reality, that is, by direct observation, and measurement, two essentials of what is now known as the experimental method of science. Though not very accurate on account of his crude methods and instruments, yet his method was correct in principle, and it is essentially like the one in use today. It is one of the major contributions to geographical thought and science, because it substituted measurement for speculation.

Geography as a science has necessarily lagged behind discovery and especially during the Middle Ages, followed the general decline of learning. But with advancements in physics and astronomy, like the heliocentric theory of the Universe of Copernicus (1543), being substituted for the previous geocentric universe, and the new discoveries of lands, there was, as it were, a new spirit in all science including geography.

Although the roots of geography as a science reach back to Classical Antiquity, its establishment as a modern science was essentially the work
from 1750 to 1850, of the two great geographical pioneers, Humboldt and Ritter, though German geographers immediately preceding these two men, put down the main outlines of the science of geography thereby laying the foundations for these pioneers.

Carl Ritter (1779-1859), was a scientific geographer, historian, and a great teacher, more than any one else before. He realized the intimate relation between man and nature, and made this the means of uniting into an organic unity what had up to this time been largely a mass of unrelated facts. This idea, he expressed in his numerous works, particularly in his 'Geography in relation to the nature and history of man'.

Ritter emphasized the necessity of using physical geography as the basis of political geography and history. He coined the expression 'Comparative Geography', meaning, a comparison of the physical features of our country with similar features in another, therefrom deriving some common principles. He not only wrote on the science of geography, but laboured with his contemporaries to adopt his ideas and to make geography a cultural and disciplinary study, which to this time had scarcely been.

Alexander von Humboldt (1769-1859), was a great naturalist, explorer, and author of 'Cosmos'. The extensive accounts of his scientific expeditions laid the foundations for the science of geography, mainly physical and economic. He emphasized the physical side of geography and studied, among other things, the influences of the natural environment, and of economic conditions upon social and political life. He made altitude studies and
invented profiles and isotherms, and developed the subject of plant geography on scientific lines.

Humboldt's contributions to modern scientific geography is to be found not only in the value of the works which he produced but also in the fact that he first clearly portrayed the distinction between systematic, but chorological, studies in geography, and systematic studies in the special sciences.

The extraordinary accomplishment of each of these men, working at the same time but in different ways, and the influence of their work on all subsequent geography, justifies our regarding them as the founders of scientific geography in the true sense of the term. While Ritter correlated his observations of a vast number of geographical phenomena, and considered them in their relations to each other, Humboldt laid stress upon the Earth as the field of man's activity. He, the latter, was the prototype of those who by their personal influence and by their books have been responsible for enriching the science of geography within the last fifty years.

But perhaps the greatest contribution to geography considered as a reasoned and ordered science rather than a mere collection of facts, is that of Charles Darwin when he published his book, 'The Origin of Species' in 1859. His 'Doctrine of Evolution' added a new interest to the study of inter-relations and contributed to the development of geographical science. This great scientist showed that there is a delicately adjusted balance between
organisms and their surroundings taken in their widest sense. This greatScientist showed that there is The evolution of organisms involves two aspects: (i) the existence of self-perpetuating substance known as living matter, and consisting of cells whose essential material is protoplasm, the physical basis of life. This substance possesses the important properties or irritability or impressibility and accommodation to environment. The cell manifests a propensity that life persistently seeks to embody itself in some form, plant or animal, which is capable of survival, as if thought itself charged the mission to increase and fill the earth, and, (ii) the other aspect involves the 'Habitat' or environment which the living thing occupies. The influence of the environment is the aspect of evolution with which geography is concerned.

In other words, Darwin's 'Doctrine of Evolution' has added a unifying and coordinating principle which has not only prevented geography from being crushed by the enormous recent increase in known facts, but has also for the first time raised it to the level of a science. In fact, without some such unifying principle, geography could scarcely become an adult science.

Among the Ritter School, Frederich Ratzel (1844–1904), author of 'Anthropogeography', emphasised the human, the historic, and also the aesthetic side of geography. Through his vivid, interesting, and appealing description of the earth, he raised the subject of geography to the aesthetic plane. His culture area concept or the study of physical environment became the goal of geography.

In the second half of the nineteenth century, however, and with the death of
both Humboldt and Ritter, and with new development of the science, particularly in geology and biology, there was a tendency to swing away from the humanistic treatment of geography as represented by Ritter and his School of Thought, which leaned more toward the physical side. The emphasis on systematic studies appeared to divide geography into two halves, one, a natural science, the other, a social science, united only in a study of regions that hardly appeared to be a science at all, in the sense in which the time conceived the term. By the end of the period, however, reaction had set in, so that the direction of geography was again essentially that which it had been before.

At the turn of the century, the purposes of geography corresponded in a major degree in content and methodology to the conception which Humboldt had given it, namely, the Earth as a field of man's activity. Geography, then, as throughout most of its history, was concerned, as Hettner put it, to the study of the areas of the earth according to their causally related differences... the science of areal differentiation of the surface of the earth.

Modern geography, therefore, concerns itself with a systematic study of 'Natural and Cultural Landscapes': their description and interpretation. The distinctive field of geography today is associated with the study of the region in all its complexes and this is the 'binding thread' of the studies of both physical and human geography. It is rather the selective study of the humanly significant relationships which exist between the physical and cultural patterns, and which give each region its distinctive 'personality'.

In short, modern geography is concerned with the study of the earth's surface; with the recognition in any area of the elements whether of terrestrial, cosmic or social origin, which have conspired to give its character. It is, as the French maintain, a DESCRIPTION EXPLICATIVE DES PAYSAGES, (Réf: Linton, Geog. Journal, Jan 1949), or to use Professor Carl Sauer's definition, "The modern expression of the most ancient geography, namely, 'Chorology', the science of Regions".