

Produced by the Geographical Association
of Zimbabwe

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Free to paid up members of the Geographical Association
Price to non-members Z\$ 4.00

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CONTRIBUTIONS TO GEOGRAPHICAL METHODOLOGY

by

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The German scholars, Alexander von Humboldt (1769-1859) and Carl Ritter (1799-1859) are said to be the founders of modern geography by many writers e.g. Wooldridge and East (1956); Freeman, (1961); Broek, (1965). James (1972) refers to Humboldt and Ritter as forming the bridge between classical and modern geography. The rise of modern geography is part of the Renaissance of the 19th century, a movement like that of the 16th century but penetrating deeper into the realms of thought.

Geography before Humboldt and Ritter was haphazard, unsystematic and descriptive. It was a jumble of political, statistical facts and place names, a catalogue of facts about the earth's surface. A good example of the geographical literature of that time was a text by Hohann Ernst Fabri's 'Kurzer Abris der Geographie' which appeared in Germany between 1785-1795. It was an arid list of countries, political divisions cities, reigning houses, etc. Ritter (in Allgemeine Erdkunde, 1862) complains:

A systematic organisation of material is seldom to be found in them ... They contain at bottom only an arbitrary, unorganised, unsystematic compilation of all sorts of noteworthy phenomena, which in the different parts of the globe appear to be especially striking ... The facts are arranged like the pieces of a patchwork quilt, now one way, now another as if each disconnected piece could stand by itself. (pp. 21-22).

The progress of geography during this time was hampered by lack of reliable facts systematically collected. No wonder people like Varenus and Carpenter failed in their attempts to search for underlying principles. Crone (1964) notes that the facts were largely uncontrolled observations of men of varying capabilities in distant lands, the speculation of long dead philosophers and selected texts from the Bible. Without reliable facts generalisations and theorising were dangerous pursuits. The voyages of discovery did much to increase human-kind's knowledge about the earth's surface. The contemporary evolution of scientific thought associated with the work of Montesquieu, Voltaire and Rousseau, did much to stimulate the work of these two scholars. This evolution of scientific thought was affecting a change in outlook which slowly but decisively affected the development of science.

It is against such a background and the stimulus of the new philosophy that the contribution of Humboldt and Ritter to

modern geography can be seen. Crone (1964) describes Humboldt as:

An accurate and painstaking surveyor, and industrious botanical collector, a student of political and social conditions, an untiring inquirer into the myriad of natural phenomena which present themselves to his keen eye, but above all, he was pondering upon the natural world and searching out its underlying unit. (p. 51)

Tatham (in Taylor, 1951), writes of Humboldt as a man of great versatile genius, well informed in many branches of science. Humboldt first became a mining engineer after studying Geology under Werner at Freiburg but soon turned to the career of a natural scientist and an explorer. He also read physics and chemistry. His interest in geography was inherited from George Forster who taught him the method of careful observation and the critical treatment of facts. Forster's artistic but scientific description of the landscape greatly impressed Humboldt. He developed Forster's technique to the peak of perfection and his method became a model and a spur to later workers.

Humboldt's aim was to recognise unity in the vast diversity of phenomena and by exercise of thought, and the combination of observation, to discern the constancy of phenomena in the midst of apparent changes. His method was empirical and inductive. He made multitudinous observations from 40 different instruments he carried on his journeys. He accurately recorded measurements of heights, areas, lengths, temperatures, latitude, etc. Most of his journeys were in South America and Russia where he collected, classified and interpreted plants, animals and rocks according to their origin and geographical distribution. Tatham goes on to point out that nothing escaped Humboldt's eye, and no aspect of nature failed to arouse his scientific curiosity. Because of this Humboldt made contributions to a number of fields.

Humboldt used the term climatology and writers like Dickinson (1969) think he probably coined it. The basic procedure was to arrange the facts in groups, measure and assess, so that the phenomena of warmth could be brought under empirical laws. Using data he collected from his measurements, Humboldt compiled isothermal lines on a map. He illustrated that the lines near the equator were parallel to it, but spread north over the sea and south over the land and that they reach further north on the western sides of continents. He also came up with the idea of continentality after examining his temperature figures.

The result of his massive collection of South American plants was the firm basis of plant geography. He distinguished between the distribution of individual species and the numerical associations of plants in particular places. Compiling lists of plants by continents obscured the distribution of plants in different isothermal zones. He pointed out that other facts, apart from climate, influenced plant distribution. His argument was that the study must seek laws that determine the physiognomy of nature in general, the

regional character of vegetation of the whole of the earth's surface, that explains the grouping of contrasted forms in different altitudes. It must pursue the causes of the recurrence of all forms of animal and plant life in fixed ever recurring types. This in fact clearly emphasizes the core of plant geography.

Humboldt's method was to describe the face of the earth as a 'whole' and he included people and their work in the concept of nature and natural areas. He argued that only through the interconnections of phenomena can one evaluate any one of them. The aim was not simply to measure one phenomenon but to bring out the ways in which the great variety of observable phenomena of the landscape are associated and interconnected with each other at different places. As noted above, Humboldt contributed to a variety of fields of knowledge and he was also concerned with the areal associations of nature and organic phenomena. He is generally ranked as founder of plant and physical geography. As he also recognised the interdependence of areal phenomena and the need for explaining any one set of spatially distributed phenomena in relation to their spatial context, Humboldt can, in this sense also be considered to be a regionalist. His position and work stand unassailable for the reason that he perceived clearly the limits of the field in which he was working. He was guided by clearcut principles. He was not delivering laws but seeking them out. The age of specialisation or systematic studies came into being largely as a result of Humboldt's work. The volume of recorded observations about the world and man's place in it, had greatly increased and no individual scholar could hope any longer to master the world's knowledge about the earth.

Ritter was greatly influenced by the educational methods of men like Rousseau, Pestalozzi, Salzmann and his teacher GutsMuths. These men insisted that clear thinking must be based on careful observations of things and that words could have no meaning unless matched with perceptions. Ritter was taught how to observe nature during the frequent walks with his teacher. He was encouraged to formulate for himself the concept of the unity of people and nature and thus he derived the central concept 'unity in diversity' at an early stage. Unlike Humboldt, Ritter held several academic positions during his life. He became professor of history at Frankfurt in 1817. In 1820 he took up a post as lecturer in geography at the University of Berlin until his death in 1859. He held other positions during his life time. He lectured on history at the Prussian military school where he became director of studies for the corps of cadets. He founded the Berlin Geographical Society and he undertook many field trips each summer to various parts of Europe.

Ritter's emphasis was in teaching a geography, a new scientific geography, instead of the lifeless summaries of facts about countries and cities, mingled with all sorts of scientific incongruities. He based his scientific geography on the concept of unity in diversity, the central concept running throughout his major work, the *Erdkunde*. Ritter's purpose was to understand the interconnections, the causal interrelations that make the areal associations cohesive. He conceived of geography as an empirical science. The study should proceed

from observations to the search of general laws. It should not proceed from preconceived ideas, to hypothesis and observation. We should ask the earth for its laws, Ritter argued. His search for unity in diversity led him to use the regional approach to geography instead of the systematic approach, although he saw the importance of systematic studies. Humboldt's systematic work helped him in his special studies of regions. Ritter saw each region as constituting a unique individuality, as being a 'whole' in itself and he said to inquire into and present the individuality of the earth was the highest task of geographical science.

Ritter's philosophical view was teleological. He saw in all his geographical studies the evidence of God's plan into building the earth as the home of humankind. This view was considered by later workers as unscientific and brought his work, the *Erdkunde*, into disrepute, although it had no effect on the method and substance of the work.

Ritter's work on Asia and Africa was based on other people's observations. He stated that his field studies of Europe made it possible for him to give an interpretation of other lands without actually going there. Curiously enough, as Fritz Kramer (1959) reports, Ritter's description of places he had never seen were more vivid and accurate than descriptions of places he had actually visited. Here is therefore a difference between Humboldt and Ritter.

The contribution of Humboldt and Ritter to modern geography are therefore great. They moulded the substance of geography into scientific form. Their scientific organisation of knowledge was done in two stages. The first stage was the assembly of accurate facts by observation and measurement. The second stage consisted of giving the material coherence and making it intelligible by considering it under a number of laws to show the relationship of cause and effect to be found in the phenomena in a simple and concise way. Thus both Humboldt and Ritter emphasised the importance of the empirical method of research. In a letter to Blumenbach in 1795, Humboldt is reported to have stressed the importance of the empirical method of science as one best grounded and most likely to succeed. For geography to be considered a science it must establish laws and this is what Humboldt and Ritter strove to do in their major works. Ritter put the position clearer when he said that he had demonstrated that geography had a right to be considered a sharply defined science, of kindred dignity with the others. Geography must go on to know the causes of things, *'rerum cognoscere causas'*.

Ritter and especially Humboldt, showed the value of the comparative method. Humboldt clearly showed this in the handling of his multitudinous observations. His essay on the steppes and deserts is full of comparisons between steppes and oceans and between all the steppes of the world. The idea was revealed in his studies of the heaths of central Europe and llanos of South America. By these comparisons he sought to reveal the characteristics and physiognomy of each study as determined by diversity of soil, climate and altitude. He compared new observations to previous ones of similar kind and recorded the differences and similarities. Ritter observed

that causal relationships were to be sought by the comparative method, the geography that went beyond mere description was comparative. This can be seen in the Erdkunde where the method was applied in the study of regions to distinguish natural regions.

Systematic studies are generally attributed to Humboldt, e.g. climatology and plant geography. Regional geography is Ritter's domain, but in his lectures he emphasized the importance of systematic studies as the basis of regional geography. A final volume on systematic studies was included in his plan of the Erdkunde, and, as pointed out above, he used Humboldt's systematic work to help him in his regional geography. So even if their work overlapped, it was largely complementary. Humboldt gave method and form to systematic geography while Ritter established the framework of regional geography. Together, they provided an almost complete and modern programme for geography.

Humboldt contributed his characteristic method, the graphical representation of data. He used isotherms to facilitate his studies of comparative climate. He drew sections across the Andes and used the profiles to show altitudinal belts of vegetation. He also used these sections to show geological structure. Though Humboldt was not the first to do these cross-sections he demonstrated their value and was so successful that their invention is often attributed to him. He was the first to divide regions he explored into botanical provinces on maps published in 1814. Humboldt and to some extent Ritter gave modern geography graphical methods that make it possible to study geography in a meaningful way.

Humboldt and Ritter differed in their philosophical approach to nature. Humboldt's concept of unity and causality was more aesthetic than theological. Ritter linked his concept of 'wholes' with a teleological view of the universe. This was later criticised as being unscientific but this view is instructive in that it is dynamic because it considers the present and the future. A teleological philosophy can be combined with most rigid scientific accuracy in research. Another line of criticism came in their cause and effect analysis. This was later associated with the unpopular mechanistic and deterministic metaphysical concepts. Harvey (1969) stresses that the main contribution of Humboldt and Ritter to explanation in geography was their insistence that cause and effect laws could be established to explain the occurrence of geographical distributions. There is no need to regard cause and effect analysis as necessarily implying causal deterministic explanation.

Thus Humboldt and Ritter gave geography a strong foothold among the natural sciences, offering more to fire the imagination, to attract the spirit of scientific inquiry.

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