

*On the Content of Modern Geography and its uses in the Community*¹

§ 1

AS of most sciences, the origins of geography lie in the cosmological speculations of the ancient philosophers. But these, with the descriptions of natural wonders and distant peoples, even when multiplied a thousandfold, after the Age of Discovery, by the advances of bold pioneers into unexplored parts, are far removed from the geography of today. Indeed, the subject professed in the present century could only come into existence after the world had been fully discovered. During the past 150 years, geography has been transformed by adopting a more scientific methodology and by incorporating the results of kindred sciences. Several phases of this development may be distinguished.

At its foundations, since measurement is the basis of all scientific knowledge, much effort has been devoted to the accumulation of quantitative data. These may be regarded as the raw material of the subject, the origin and justification (or refutation), of generalisations, hypotheses, syntheses, or systems of classification, which may be propounded. For as detailed topographic surveys spread over the continents, the accurate delineation of relief, rivers, the vegetation and features due to human activity permits increasingly precise answers to be given to questions of geographical fact. The far-flung network of meteorological and climatological stations allows quantitative instead of merely qualitative description of climate and weather. Statistical inquiry—essentially the measurement of social phenomena—supplies the means of enhancing the accuracy of human and economic geography.

Moreover, there has been much classifying and interpreting of geographical facts, and formulation of generalisations. Thus, relief forms may now be classified in terms of the stages—youth, maturity, or senility occurring in the "Geographical Cycle"—by which relief is conceived to develop from an initially plane surface through stages to a maximum of ruggedness, after which its intensity declines till the original state is again attained.² Towns may now be classified according to the nature of site and relationship to routes; as well as internal organisation and function. Investigation of the territorial extent and basis of power exercised by former and existing poli-

1. An inaugural address, delivered on 16th October, 1947, at King George's Hall, University of Ceylon, Colombo. In its final form, the address has benefited much from Mrs. Lebon's criticisms of the first draft.

2. W. M. Davis, *Geographical Essays*, Boston, 1910; *Die erklärende Beschreibung der Landformen*, Leipzig, 1924.

tical units enables us to understand the *role* of plains, mountains, peninsulas, islands, rivers, passes, marshes and coastal features in the growth or decline of states. "Land power" and "sea power" are terms possessing a definite connotation for the political geographer.³

Most important of all, the subject has been profoundly altered, like other biological and social sciences, by the idea of evolution, which, although not originated by Charles Darwin, became vastly more credible and influential when he demonstrated that natural selection might account for the appearance of new species.⁴ Thus, in one of the oldest and most fundamental works on anthropology (by Tylor), we find that the principle of progressive evolution from a simple beginning to increasing complexity is employed to classify the work and other activities of man as a social animal: the invention of tools, of language and writing, of arts and crafts, of social and political organisation. Here we may readily discern that a method had been devised and was being applied in conformity with the more generalised sense of the word evolution, *i.e.*, an unfolding or development comparable with the appearance of the flower from the bud or of the mature organs from the embryo. For geography, the theory of evolution carried both similar and different implications. Living organisms cannot be dissociated from their environment; the drama of life and the stage upon which it is played form a unity. Thus was a new human geography born—the study of the bond between the human community and its habitat—and the subject itself preserved from disruption; for, as I shall shortly show, new specialised sciences already threatened to partition its accepted field of study. Carl Ritter, the first to occupy a chair of geography (at Berlin, from 1817), had actually anticipated this development, for in a book published about the same time as the "Origin of Species," he had written

" history does not lie in a domain adjoining nature, but actually within the bosom of nature . . . In studying the human soul, the mode of its training and the way of its working—and that is history, we cannot leave out of view the outward field in which it finds its home, the world where it meets the phenomena it investigates."⁵

The metaphysical flavour of this passage somewhat obscures its significance in heralding modern geographical thought; and it cannot be claimed that Ritter accomplished more than to erect a sign-post for his successors. It was

3. H. B. George, *The Relations of Geography and History*, Oxford, 1913; L. Febvre, *Geographical Introduction to History*, London, 1925.

4. H. J. Fleure, *Geography and the Scientific Movement*, *Geography*, XXII (1937), pp. 178-88; *Geographical Thought in a Changing World*, *Geographical Review*, XXXIV (1944), pp. 515-528.

5. C. Ritter, *Vergleichendes Geographie* 1857.

Darwin who made the road. Moreover, in being thus impelled to investigate the nature of the bond between human society and its environment, geography was given a third dimension. From a state of being concerned solely with the existing activities and distribution of men, it became evident that the present was growing out of the past—not merely the immediate historical past; but the remoter prehistoric past, which in Darwin's age was being revealed as the first archaeologists disclosed the life of cavemen in western Europe during the Ice Age.

What, may be asked, are the scope and methods of modern geography? How may its field of study be defined? Largely following Vidal de la Blache,⁶ I believe that twentieth-century geography possesses five main characteristics.

Firstly, geography investigates combined phenomena at the surface of the earth, due to the interaction of the biosphere (including man) with the lithosphere, the atmosphere and the hydrosphere. Thus, to a geographer, a river owes its varying discharge (or régime) partly to the fluctuations of rainfall and evaporation, partly to soil and the structural characteristics of its catchment area. It is thus the outcome of a certain combination of climatic phenomena with geological features. Moreover, as an element in the hydrosphere, it is in itself an agency sculpturing the earth's surface; it is necessary to invoke its present and past operations when seeking to explain the form of its basin. Or, to take another example from the sphere of human geography, the agriculture practised by a community reflects not merely the soil characteristics, climatic range and useful plants of the local flora, but also the needs, organisation and aptitudes of the society. Here, again, an assessment or appraisal of the interaction between certain physical processes and social activities is being undertaken.

Secondly, geographical method is essentially synthetic, and this is due to the complex nature of the field of study, just defined. The separate elements of the combined phenomena are, in isolation, the subject-matter of other sciences. Rocks are the concern of the mineralogist and geologist as well as the geographer; plant life of the botanist; and atmospheric phenomena of the meteorologist. It follows that the geographer often seeks to reinterpret or synthesise the findings of more specialised sciences.

This has led to much criticism, and to much heart-searching on the part of geographers. Is he not a jack of all trades and master of none? Since the immense expansion of human knowledge, and the maturity of specialised sciences, physical and social, is it not true that the geographical field of study has been partitioned for ever? Although her early preoccupation

6. *Annales de Géographie*, IV (1895-6) and XXII (1913).

with physical and biological phenomena entitles geography to the appellation "mother of sciences," has she not failed to keep pace with the increased tempo of intellectual development, being forced into sedate retirement, or at best puffing on uneasily whilst her numerous and lusty progeny press forward with the vigour and confidence of youth? Thus, in Britain, the labours of Hutton, Lyell and their successors were rewarded by the creation of a new subject—geology—within two generations; and resulted in the establishment of university departments before geography achieved academic recognition. Indeed, by a curious inversion, many British university departments of geography have grown to independence under the wings of geology; and several senior British geographers were by original training geologists. It is still claimed by some that geomorphology—the science of land forms—is a part of geology, outside the geographer's province: or, if you will, is a bequest from deceased geography to geology.

Reacting to these criticisms, several thinkers in the present century, seeking to isolate geography from its entanglements, e.g. Brunhes,⁷ Passarge,⁸ and Sauer,⁹ have sought to limit geographical study to the landscape, natural and as modified by man. Human societies are therefore reduced to the rôle of instruments or agencies like the forces of denudation or the action of the tides. This procedure may possibly mitigate the quarrel with some of the physical sciences; and help to distinguish human geography from the social sciences. But although these writers have no doubt gained a sense of holy separation from corrupt surroundings, it has always appeared to me that in actuality there is great difficulty in preserving this intellectual purity. Its artificiality becomes manifest; we are reminded of the American version of Hamlet without the principal character, or Plato's parable of the imprisoned truth-seeker to whom only shadows of the real world were visible on the walls of his cell.¹⁰ To me, it has always seemed that geographers, concerned with combinations of physical phenomena, must to a certain extent occupy common ground with some physical sciences; and studying certain phases or aspects of society, must overlap some of the social sciences. Geography, in short, must be distinguished by its methodology rather than by the distinctive field it occupies. Its late revival and regeneration after the establishment of the newer analytical, specialist sciences was in fact inevitable, since, depending as it does upon their activities, it had to await their development before commencing its own synthetic operations. And as for the controversies and

mutual criticism engendered by this overlapping, when did disputations cease to be the handmaid of advancing knowledge and understanding? How often has progress been achieved along the boundary between two previously established fields of study?

But there are certain other implications of this view concerning the synthetic nature of geography, and its relations with cognate studies, which must be examined. If geography is to utilise the products of other sciences, those professing it must possess more than rudimentary acquaintance with their methods. Otherwise, in attempting to cultivate such wide expanses, serious geological, botanical, physical, anthropological or meteorological omissions and errors may occur. Geographical synthesis may be proved shallow or even erroneous, when criticised by a specialist whose subject has been ineptly plucked. It follows that the better a geographer understands the technique of cognate sciences, and has submitted to training therein, the less his liability to erroneous inductions. Thus may well sound extremely revolutionary doctrine to a university within which, till now, geography has been taught almost entirely within the Arts Faculty. But the tendency in both Britain and America is to regard training in cognate sciences as essential. In London University, a one-year course in geology will within the next few years become compulsory for all candidates for geography degrees. It is probable that in most universities, and certainly in this one, too little training is provided in cognate sciences, and too much time is spent in trying to synthesise ingredients which are imperfectly understood by the student and perhaps even the lecturer. It seems essential therefore to intensify training in cognate or basic geographical sciences; even if the time actually devoted to Geography is reduced. A student might well devote his second University year, *i.e.*, after passing the first university examination, to the associated subjects, to his immense benefit and stimulus when he re-commences geographical courses of a more advanced order.

Returning to the enunciation of geographical principles after this lengthy digression, it may be stated, thirdly, that geography endeavours to formulate generalisations and classifications, which are valid all over the earth. This concept of terrestrial unity was first stated by Carl Ritter, who wrote:

"the earth is a unit . . . an organism of itself . . . it can be studied in no one of its parts . . . the near and the remote are all blended in a system of mutual interdependence, and must be looked at together."¹¹

Towards the end of last century, Vidal de la Blache, from his chair at the Sorbonne, was seeking to realise "the solidarity of terrestrial phenomena."¹²

7. J. Brunhes, *La Géographie Humaine*, Paris, 1912.
8. S. Passarge, *Einführung in die Landschaftskunde*, 1933. Cp. R. E. Dickinson, *Landscape and Society, Scottish Geographical Magazine*, LV (1939), pp. 1-14.
9. C. Sauer, *The Morphology of Landscape*, *University of California Publications in Geography*, II (1925), pp. 19-53.

10. Republic, Book VII.

11. C. Ritter, *Vergleichendes Geographik*, 1857.

12. *Annales de Géographie*, IV (1895-6) and XXII (1913).

At the same epoch, his distinguished contemporary, Emmanuel de Martonne, from the University of Paris, published the first classification of climates, demonstrating that a relatively small number of climatic regions, each characterised by a distinctive climatic type, are distributed over the globe in such a way that each may be grouped with homologues, located in similar latitudes and similarly with respect to the land masses.¹³ It thus became possible to speak of the terrestrial system of climates. (For lack of time, I must forbear from further illustrating the fruitfulness of this principle in physical and human geography).

Fourthly, geographical science is essentially distributional. The phenomena with which it is concerned possess the property of extension over the surface of the earth. Human geography deals with spatial aspects or the space-relationships of society. The degree of tenuity or aggregation of humanity over the earth's surface is not readily explicable; nor the consequences of the various distributional patterns to the constitution and organisation of society. In this age of rapid change in the means and efficiency of communication, we still have much to learn about the relativity of space and distance.

Fifthly, still seeking a traditional objective,—for geography was “the description of the earth”—the modern student devotes much effort to the analysis of larger or smaller areas of the terrestrial surface. Concomitantly, of the nature and definition of the real unit for the purposes of geographical study (commonly called “the region”), has been much discussed.¹⁴ Vidal de la Blache spoke of the “descriptive method in geography,” and provided a brilliant exposition in his “Tableau de la Géographie de la France,” inspiring his contemporaries and pupils to collaborate in the production of a 23-volume “Géographie Universelle,” which, begun in 1927, is now nearing completion.¹⁵ Perusing these volumes as the highest modern achievement in regional geography, we observe how all the authors seek to marshal well-ascertained facts from a range of scientific sources (not neglecting the resources and devices of cartography) to produce well-balanced and comprehensive surveys. Apart from the incomparably more detailed and objective factual basis, compared with earlier “universal geographies,” such modern compilations are perhaps less purely descriptive than interpretative; and it is thus proper to speak of the art of the geographer as well as the science, because considerable practice and discrimination is required to preserve due proportion in the final synthesis. (It is in this aspect only

that geography possesses affinities with Arts subjects). Much regional geography suffers from undue emphasis upon structural geology, or the anthropological constitution of the population, or the production of and trade in local commodities. Specialist monographs upon these subjects may well provide ingredients for regional geography, but are no substitute for it. To me, therefore, La Blache's “descriptive method” means “the balanced interpretation of geographical phenomena within a region, or the world.”

Regional geography, viewed in this fashion, although a major objective, does not preclude more specialised investigations, or more speculative essays. Of such a calibre was Mackinder's inquiry into the nature of world political power, and the conditions under which it could be based either upon the land-mass of the Old World, or the command of the oceans.¹⁶ The controversy which this book engendered, when published nearly twenty years ago, still smoulders and has been rekindled into flame during the present decade.

§ 2

After this prolonged (and necessarily somewhat abstract inquiry) into the nature of modern geography, it appears incumbent to turn to the more specific. The origin of civilisation is a fascinating and difficult subject, attracting attention from geographers because of its basic importance to the distribution of races, languages and cultures in the Old World. Moreover, by taking a broad view of the problem, and, in particular, by reconstructing the environment of early man, the nature of the stimulus prompting men to tread the path from barbarism to civilisation has been largely disclosed, and an answer given to the very pertinent and wholly geographical question “Why did civilisation originate *where* it did?” I turn then, first to western Europe, and then to the lands of western Asia.

For three-quarters of a century it has been well understood that man was living in the Old World during the latter half of the geological Pleistocene age, when, (in what is now Europe), Scandinavia, the Baltic Sea, Germany, the British Isles and the Alps were, during more than one period, ice-covered, and the climate of surrounding regions was much colder than today. The fundamental civilised arts were then unknown; implements were of chipped stone and food was obtained largely by hunting. At the climax of the last or Würm glaciation (from about 23,000 to 13,000 B.C.) the sub-human race known as *homo neanderthalensis* (Neanderthal Man, so-called from a cave in the Neander valley, near Heidelberg in Germany, where skeletal remains were first discovered), survived precariously. But, as the climate ameliorated, the first races of modern man, entitled to the specific name *homo sapiens* (first identified in remains found in caverns at Cro-Magnon and Combe-Capelle), entered Europe from Africa by land-bridges at Gibraltar and Malta.

13. E. de Martonne, *Traité de Géographie Physique*, Vol. I, Paris, 1899.

14. Classification of the Regions of the World, *Geography*, XXII (1937), pp. 253-282.

15. P. Vidal de la Blache, *Tableau de la Géographie de la France*, Paris, 1908; P. Vidal de la Blache and L. Gallois, *Géographie Universelle*, Paris, 1927.

16. H. J. Mackinder, *Democratic Ideals and Reality*, London, 1919.

Possessing much greater skill in the arts of flint-chipping and the use of bone, these hunting-folk probably exterminated Neanderthal Man, and proceeded to settle in what is now France and Spain, dwelling for long periods in natural caverns, of which those in the Dordogne valley are most celebrated. They appear to have flourished, thanks to abundance of game in an area the plant cover of which resembled the present Barren Lands of northern Canada; and to have preserved autumn-killed meat for winter consumption. The winter, therefore, became a season of repose; and it was perhaps to occupy hours of idleness that the remarkable cave-drawings of the upper Palaeolithic Aurignacian and Magdalenian periods were conceived. In addition, models were made of clay, and ivory employed for carving figurines. It appears from the subjects of this art that magic and religion were already developing. As already suggested, this advancing culture may be connected with abundant sustenance and with the existence of a season of repose which was not a season of privation. It may be added that there was probably a mingling of two human migrations, for after the original entry from the south, another people (bringing the Solutrean culture) reached France from the east, passing between the diminishing Alpine glaciers and the retreating Scandinavian ice-sheet. Thus at this early epoch, the rôle of what is now France as a meeting-place of central European and Mediterranean cultures had become evident; and French writers¹⁷ dilate with some pride (conscious of their own eminence in western civilisation) upon the coincidence of the most advanced palaeolithic culture with the soil of their country. But after about 7,000 B.C. the advance ceased; stagnation and decline followed. Upper palaeolithic man continued to exist in France and eastern Spain, but his arts reveal inferiority compared with his predecessors. Some groups, moving northward to the shores of the Baltic Sea, accumulated the vast kitchen-middens from remains of shell-fish which by then had become their chief food in place of meat. In short, in western and central Europe culture remained decadent for nearly four thousand years, till the arrival of newcomers better equipped for the arts of living. The early promise of the Magdalenian period was not to be fulfilled; civilisation did not originate upon European soil, but was introduced from the Near East, spreading slowly by way of the sea and the Danube valley during the Bronze Age.

Turning then to what are now Mesopotamia and Syria, we are confronted with evidence that within a short space of time during the sixth millennium B.C., a social and economic revolution was wrought, at least of equal importance to humanity as the Industrial Revolution which so exercises our minds today. Methods of cultivating cereals, the domestication of the sheep, ox, ass and dog,

¹⁷ e.g. J. Brunhes, *Géographie Humaine de la France* Vol. I, c. 3, Paris, 1920.

the potter's art, the use of copper and the utilisation of clay, reeds, stones and wood to build houses were adopted in quick succession or perhaps simultaneously either in the Mesopotamian plain, or at the foot of the mountains to the north and east. From this centre, knowledge of these arts, and of the settled village life which they promoted, were diffused during the succeeding millennium to Turkestan, Anatolia, Crete, Syria and Egypt.

How may we account for these events? In Europe, early progress was arrested; but in the Levant, a swift blossoming ensued. Why was the second act of the drama swiftly moved two thousand miles from the scene of the first?

It is to the labours of that company of scientific scavengers—those specialists in antique rubbish—the archaeologists, that we are most indebted for our knowledge of early man. They have demonstrated the succession of cultures from early palaeolithic times onwards from their close scrutiny of skeletal fragments, broken pottery, ornaments, weapons, tools and the foundations of hutments. Anatomists have expertly collaborated in reconstructing the physical frames of early men from battered skulls, fragmental femurs and pelvic pieces. Geologists have, by tracing stages in the recession of the Würm ice sheet, and accompanying sequences of coastal or river terraces, provided not only a chronology but also important evidence of geographical changes before the beginnings of history. Botanists have investigated the striking post-glacial floral succession preserved in the peat-mosses of Denmark and north-west Germany. Zoologists have identified the remains of now extinct animals, from the middens remaining after the feasts of prehistoric man. Thus it has recently become apparent that not only can these diverse scientific studies be synthesised; but that environmental changes greatly influenced the halting, hesitating progress of early man. In brief, an attempt to combine findings of the specialist sciences in a comprehensive review of the life of man in relation to the environmental problems he encountered between 7,000 and 5,000 B.C. is a positive contribution to knowledge, and is also historical geography.

At the time of the upper palaeolithic progress in France and Spain, the climatic zones of the Old World lay farther south than at present. Dry easterly winds prevailed over central and western Europe, especially in winter; the Mediterranean was the usual track for lows or depressions throughout the year; and what are now the Saharan and Syrian deserts were blessed with a moderate rainfall, probably mainly in winter.¹⁸ Although forests

¹⁸ E. Gautier, *Le Sahara*, Paris, 1927, thinks that this was true only of the western Sahara. If Libya and upper Egypt were at this epoch already desert, the region within which it seems probable that *homo sapiens* evolved would be the more effectively isolated.

existed along the Mediterranean shores, the interior of north Africa was probably a vast grassland or parkland, inhabited by countless animals, large and small. In this favourable warm-temperate environment, *homo sapiens* probably had been evolved. Moreover, eastern Spain, France and western Germany were also unforested, with a similarly great wealth of animal life which doubtless attracted man both from Africa and eastern Europe by the routes already described. But here the colder climate, especially in winter, enforced a cave-dwelling existence, and also permitted a rest-season with its potent consequences for the development of thought and art.

But from about 7,000 B.C. profound geographical, especially climatic, changes began, constituting a crisis in human prehistory. Progressive retreat of the ice sheets over Scandinavia, the British Isles, and the Alps was accompanied by a northward movement of the principal storm-belt which now came to exhibit maximum intensity (as today) over north-west and central Europe. Lows now visited the Mediterranean only in winter. In a milder, moister climate, the grasslands of western Europe became tree-covered, first by pines and later by a denser, tangled oak forest which was to persist in many places almost till modern times. Hunting became more difficult; the great herds of wild animals retreated eastwards, where the steppes were attaining their present appearance along the lower Danube and in south Russia. Thus in the west, the epi-palaeolithic cultures became isolated and decadent in a less favourable environment. But eastwards, human groups, following retreating game to the Russian steppes or beyond, became differentiated from other men, becoming taller, possibly fairer of complexion and perhaps evolving the ancestral Aryan speech. Meeting wild cattle and the Asiatic wild sheep, they probably turned from hunting to nomadic pastoralism. Here we must leave this new race and culture, pregnant with the future crises accompanying its later dispersion and look southwards, where recession of the storm-belt from the Mediterranean caused the Sahara to become a desert. With the inevitable decrease of its animal population, mankind was left without its customary source of food. Unquestionably a great dispersion began—to central Africa, and south-western Asia, (where it is possible that the first human foot trod the Indian sub-continent). Remaining groups settled by the Nile Valley, along the Tigris and Euphrates where game was still to be hunted in the marshes, at the foot of the Armenian and Persian highlands, or in Anatolia. Further racial differentiation accompanied this dispersal, including the appearance of the Alpine-Armenoid race of broad-headed people, and the longer-headed group known as Semitic. Wild wheat and barley have been observed in many districts of south-west Asia, and native copper in southern Armenia. It would seem that the early Semites, possibly stimulated by contact with

Armenoids and certainly forced to depend increasingly upon the plant world for sustenance, began to cultivate the western bread grains, and thus to adopt a settled agricultural existence.

We thus see that the great climatic changes of the seventh millennium B.C. helped to disperse and differentiate races and cultures in the Old World, by altering both the plant cover and animal population over wide areas. But it was at the heart of the regions occupied by man and not at the periphery, where culture-contacts were possible, that the great advances were made. For the development of civilisation in south-west Asia is accompanied by indubitable archaeological evidence of the mingling of races and cultures. Thus at the beginnings of civilisation, as during the climax of upper palaeolithic culture, we can discern both the influence of environmental change, challenging the resourcefulness of man to new ways of living yet supplying the means thereof, and also the importance of contacts between peoples, encouraging rivalry both in the arts and social organisation.¹⁹

§ 3

It is a far cry from the origins of civilisation to the problems confronting modern societies. Till recent times, there were few ways in which geographers could be of service to statecraft. Perhaps the most important occasions arose during the negotiation of treaties involving boundary or frontier questions. In the present century, however, newer social problems have arisen. The geographer has played his part not merely in demonstrating the existence and nature of these problems, but in formulating policies for their solution.

During the present generation, the American people has become aware not only of its material prosperity, but also of the extent to which this abundance is dependent upon physical resources by no means infinite. Intensive consumption of plant and mineral products implies a correspondingly rapid drain upon natural sources of staple commodities. Accordingly, we find that shortly after the first World War, a manual treating of the geography of North America, by Russell Smith²⁰ of Columbia University, not only depicted the geographical basis of the "boom" then in progress, but, echoing the conclusions of several specialists, gave considerable emphasis to the rapid depletion of certain natural resources. He lamented the

19. For the preceding interpretation of prehistory, I am much indebted to H. Peake and H. J. Fleure, *The Corridors of Time*, Oxford, 1927-36, especially, Vol. 2, *Hunters and Artists* and Vol. 3, *Peasants and Potters*.

20. J. Russell Smith, *North America*, New York, 1925. Writing in chastened mood before publishing the third edition in 1940, the author regrets his failure during the twenties to stress even more fully the depletion of natural resources.

squandering of the best hard-wood forests in the continent during the mid-nineteenth century settlement west of the Appalachians; and showed how the soft-wood forests of New England and the Gulf coast had been as rapidly exhausted, leaving remoter Pacific and Laurentian forests to meet still increasing demand from the American and Canadian peoples. He also vividly described the consequences of soil erosion in the cotton-growing South due to unsuitable systems of cultivation and cropping. The influence of a text-book is sometimes as under-rated outside an University as it is over-rated inside: in this case its use in the training colleges and schools of a highly-developed educational system at least prepared the younger generation for events in the next decade. In 1932, the coincidence of a severe business depression with unprecedented dust storms from the over-grazed and over-cultivated Great Plains administered a shock to a nation till then prodigal in its utilisation of natural resources. The way was now fully prepared for the far-reaching measures of the first Roosevelt administration. A whole range of new government agencies began a comprehensive survey of national resources, soil conservation, forest protection, and rural reconstruction.²¹ The stage of mental preparation had passed; the time for action had come.

In 1937, when travelling in North America, I visited the offices of the Tennessee Valley Authority at Knoxville. Here I met a band of young men, all recent university graduates of geography, who were busily engaged in rural reconstruction. Their problem was to classify land according to its actual and potential use, before deciding how districts could be regenerated. From their field-work, they were preparing elaborate maps, employing a detailed classification, as a basis for resettlement and reclamation projects. As an academic geographer, I was much gratified to observe how university class-room and field training could thus be of direct service in the execution of public policy. Passing later through Washington, I found that again many young geographers had been recruited to the new and expanded branches of the Department of Agriculture, as the spear-head of the offensive against wastage of natural resources.

In Britain events took a different course. The great economic depression of 1930-33 produced a mood of national stock-taking: a highly-industrialised and urbanised nation was made aware of rapid changes in industrial distribution which were leaving older centres derelict and were suffocating

21. E. Bowen, Some Aspects of Conservation in the U.S., *Scottish Geographical Magazine*, LV (1939), pp. 257-271, W. L. G. Joerg, Geography and National Land Planning, *G. Rev.*, XXV (1935), pp. 177-208.

Greater London. The threat of aerial bombardment from growingly-aggressive Nazi Germany was a further incentive at least to inquiry, and in 1938 the Royal Commission on the Distribution of the Industrial Population (the Barlow Commission) began its hearings. To the resultant blue-books British university geographers, in collaboration with the Royal Geographical Society, contributed cartographical evidence. Meanwhile, under Dr. (now Professor) L. D. Stamp, and largely by voluntary workers, a national stock-taking of the land—the Land Utilisation Survey—was in progress.²² The British, accustomed for three generations to live on foreign food, did not at first become concerned at this large-scale demonstration of the under-utilisation of their home soil. But the outbreak of war caused a *volle-face*; and the Land Utilisation Survey was absorbed into government departments lock, stock and barrel. In the complex problems of war-time agricultural and industrial organisation, as well as the use of land for military purposes, these experts in applied geography were able to advise. Simultaneously, as part of the movement for planning post-war reconstruction, another group of geographers began surveys, and the organisation thus created has now been given permanence in the Research Division of the new Ministry of Town and Country Planning.

At this point, I cannot do better than quote from a recent appraisal of the potential geographical contribution to national planning:

“Although few geographers have taken any active part in economic and physical planning, all are equipped to do so. The geographer is not handicapped by being too much a specialist; claiming no particular phenomenon as his own, he is trained to study the relationships between phenomena, to view a particular problem in its setting, to consider trends and the interplay of factors. He is moreover accustomed to taking evidence from specialists and applying it, to making surveys and to depict his findings on maps. This last is of special importance. Planning is in fact an important branch of applied geography.

“The contribution of geographers to planning has so far been small but not insignificant . . . Before the war, a very few geographers were directly concerned in the first attempts at economic planning in connection with the Special Areas . . . Geographers have been employed in the Ministry of Town and Country Planning since 1943, when a Research Division was started in which geographers were strongly represented.

22. L. D. Stamp, The Land Utilisation Survey of Britain, *Geographical Journal*, LXXVIII (1931), pp. 40 ff. *Cp. G. Rev.*, XXIV (1934), pp. 646-50 and XXVII (1937), pp. 1-18.

Their regional work has been largely independent of the academic geographers and results are unknown outside the Ministry . . .

"There is a strong case for the organisation of regional surveys for planning in which geographers would play a leading part, particularly in synthesising and applying the findings of specialists. Regional advisory organisations should be created to assist the research and administrative resources of government. In the immediate future many decisions may have to be taken in advance of adequate research, and there is greater need for geographers to be among those consulted beforehand. In view of the present need and opportunity for planning and of the fact that modern planning is still evolving, geographers should give serious thought to how they can make the largest possible contribution towards solving the many problems of planning today."²³

What of Ceylon? A newcomer to this island, I am still gathering impressions. Having been in Colombo almost continuously since my arrival, I am but dimly aware of the range of rural problems involving resettlement, agricultural reorganisation, irrigation, flood-protection and drainage works. I can but register my conviction that in the light of recent British and American experience, the inception and development of public schemes can benefit by the application of geographical technique.

Here in Colombo, I have at least had some opportunities for preliminary observations. It is perhaps platitudinous to dwell upon the extent of congestion and ribbon-development. But things might have been worse. A rapidly-growing modern city often exhibits a stellate-annular plan around a nucleus, the latter being the administrative and commercial centre. Immediately outside this centre is an "inner ring," industrialised and congested, which in Colombo we can see represented in Pettah, St. Sebastian, St. Pauls, New Bazaar, Maradana and Slave Island. Towards the periphery is the residential and suburban zone, often forming protruberances along main roads, e.g., along Grand Pass and Cotta Road. But it must be evident that in Colombo, fortunately, this plan is imperfectly realised. The coastal situation restricts building to a semi-circle, having the Fort as centre; the "inner ring" is interrupted by the twin-lake Beira; and the Kelani marshes effectively confine the outer suburban zone to Colpetty and Wellawatte. Here, till now, the Crown ownership of much land rendered it possible to

23. G. H. J. Daysh and A. C. O'Dell, *Geography and Planning, Geographical Journal* CIX (1947), pp. 103-107.

dedicate extensive tracts for recreational purposes. But hemming off this fine residential, recreational and scholastic district from the sea is the ribbon-developed Galle Road, where the crowding to live near a traffic artery and the sea has effectively ensured that the minimum individual and social benefit shall accrue from the broad horizons of the ocean.

I am of the opinion that the discontinuous character of the built-up area, due to the lakes, marshes and recreational areas should be preserved as an invaluable asset. It should even be given greater prominence by the creation of new parks or playing fields in Maradana, Colpetty and Wellawatte on land not yet utilised for building. Any further large-scale building should take the form of satellite towns beyond the natural green belt marshy in character and best dedicated to dairy-farming or vegetable-production just outside the present city boundary.

I am led to this view by the conviction that for a large city so near the Equator, the maintenance of natural air movement is vital to the health and comfort of the population. Colombo is fortunate, because the prevailing winds are onshore throughout the year. Open spaces within the city render this air-flow effective in Borella and Maradana instead limiting it to the sea-shore. For the surface wind readily loses momentum over houses and trees, which drag it to a standstill; but over an open space, even of only moderate extent, it revives to the benefit of residents on the far side. To be explicit, it appears to me that the area between Ward Place and Gregory's Road will be much less agreeable to live in if the Racecourse and Golf Links become built up; and worse will befall Maradana, i.e., increase in daily temperature range, if there is to be any further contraction of Beira lake, because the tempering effect of the water body will be lost. The most urgent improvement, apart from the sanitary engineers' task of tidying the slums, is to break through the Galle Road cordon, driving broad avenues to the sea to allow vitalising breezes more effectively to permeate South Colombo; and to build a promenade upon the track of that misplaced railway.

In brief, the climate of an urban area is determined, within certain limits, by size and lay-out; and is thus controllable by man. Data exist which demonstrate the climatic differences subsisting within large cities of the temperate zone as well as between those cities and their rural surroundings. I am not aware of similar investigations relating to cities within the tropics; but clearly such are needed and are of immediate practical significance. Since air movement is of such supreme importance, the value of such research would be much enhanced by the adoption of technique from

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aerodynamical science, *i.e.*, by studying models of buildings and towns in wind chambers. Thus it might be ensured that for Colombo an important principle of tropical town-planning is not overlooked, *viz.*, that its future lay-out of streets and open spaces should conserve the merits of its climate and not merely enhance the defects.

J. H. G. LEBON

POSTSCRIPT. Dr. F. E. Zeuner (*Dating the Past*, London, 1946) has argued for a more extended chronology for the upper Palaeolithic period, assigning the Aurignacian, Solutrean and Magdalenian cultures to B. C. 100,000—30,000, contemporaneous with the last glaciation. If generally accepted, this would clearly demand considerable modification in §2 (with regard to the Magdalenian cultural climax); but leaving the Neolithic situation substantially unchanged.