# Scottish Geography – The Making of a Modern Science

Academic geography as it emerged and crystallized in Britain in the years before 1914 owed a great debt to Scotland. Why was this the case? The answers lie in the prevailing intellectual climate and the pattern of scientific activity in the country, especially in the late 19th century in its capital, Edinburgh, and in the network of contacts and friendships which existed there.

## Intellectual Heritage

During the late 18th and early 19th centuries, Edinburgh was seen as a real centre of civilization.

Although in the past Scotland's strengths in intellectual activity were in philosophy and metaphysics, with the advent of the 19th century it had turned away from these disciplines and towards the physical and natural sciences. Scottish universities were respected throughout Britain and the world. Both Glasgow and Edinburgh universities were strong in sciences, while all emphasized philosophical and literary criticism. Edinburgh also benefited from many progressive and innovative thinkers outwith academia, who reinforced the city's vitality as an intellectual centre.

Much of the Scottish work and thought was directed towards practical purposes, and study had a distinctively utilitarian bias. This, together with the other distinctive intellectual traditions, was significant to the way in which geography emerged in Scotland.

## Geographical Heritage

Prior to the emergence of real interest in geography as a science and academic discipline, there had been in Scotland, focused on Edinburgh, a tradition of practical geographic work in the form of cartography and map-making, the compilation of geographical descriptions for encyclopaedias, and exploration. These activities were centralized in Edinburgh because of the intellectual status and climate of the city, and helped to develop the discipline within Scotland during the formative years of the early 19th century.

### The Map-Making Tradition

Edinburgh housed the headquarters of two of the country's largest map-making companies: Bartholomew & Sons (established in 1826) and W & A K Johnston (established in 1825). By the close of the century, many people were employed in these companies, Bartholomew's in particular having strong links with the scientific community centred in Edinburgh. They produced a series of specialized atlases designed to cover the field of physical geography, which involved scientists from a range of fields, starting with meteorology in 1899 (edited by A Buchan, A J Herbertson and J G Bartholomew) and followed by zoogeography in 1911 (designed by P Sclater).

### Encyclopaedias

Edinburgh was the main centre in Britain at the end of the 19th century for the preparation and publishing of encyclopaedias. Amongst these were the *Encyclopaedia Britannia*, the *Chambers*

*Encyclopaedia*, the *Globe Encyclopaedia* and the *Edinburgh Encyclopaedia*. The compilation of these volumes offered a source of literary geographical employment, complementing the work on the atlases, since all called for up-to-date descriptions of the regions of the world, and many also included notes on the types of phenomena and processes at work in nature.

Exploration and Travel

Scotland was the home of many renowned explorers in 19th century Britain. Scotsmen and women were prominent in the discovery and investigation of new lands. Large numbers of Scots had emigrated over the 19th century to colonize in Canada, Australia and New Zealand, while commercial and industrial ties further enhanced these links. Even the government had Scots sent abroad as representatives of the imperial power. These factors served to arouse a basic interest and awareness of foreign lands in Scotland, which tended to be realistic and not romanticized, as was the case in other parts of the country.

## Scientific Background

In addition to these practical activities in geography, there were also several strands of scientific study and research which must have predisposed their practitioners to at least a sympathetic attitude towards the geographical perspective.

It was to the tradition of work in the natural and field sciences in particular that geography in Scotland owed its distinctive strength and character. The training in scientific method and the organized field research which the Scots brought with them to geography were essential ingredients around which a reputation for orderly and scientific geographical study could be built.

The principal fields of scientific research in late 19th century Scotland were geology, oceanography, meteorology, and natural history.

Geology

Over the course of the 19th century, a strong tradition of physical geology with an emphasis on geomorphology and physiology had developed in Scotland, in contrast to England where the emphasis was more concentrated on stratigraphy and palaeontology. This resulted in strong links between Scottish geography and geology.

The key figures in Scottish geology towards the end of the century were Archibald and James Geikie. Archibald served as Head of the Geological Survey of Scotland for many years before, in 1871, becoming Professor of Geology at Edinburgh University. By 1881, Archibald had moved to London to take up the position of Director of the National Geological Survey, whilst James took up the vacant position at Edinburgh.

From 1882, James Geikie became the leading figure in Scottish geology, primarily because of his position as sole Professor of Geology in the country. He developed a keen interest in the advancement of geological research and teaching, and with his help the Scottish Geographical Society (SGS) was founded in 1884. Geikie helped to draw many men and women into the new Society, both from geology and from the university staff generally.

The Geological Survey was also a source of several of the early members of the SGS, in part due to Geikie's involvement but also due to the overlapping nature of the two groups. These men brought to the Society an added interest in practical research projects, derived from their work in connection with the Survey, which was significant in the formation of the character of geographical work in that country.

Oceanography

Research in this field was centred on Edinburgh in the last quarter of the 19th century.

This was largely a consequence of the close association of that city with the *Challenger* expedition of 1872-76. The aim of the *Challenger* expedition had been "to determine, as far as possible, the physical conditions of the great Ocean basins", and it was therefore a study of the physical geography of the ocean. The offices co-ordinating the analysis of the results of the voyage were located in Edinburgh. The director at this time was John Murray, who surrounded himself with many natural scientists, and hence the offices became a vital centre for the co-ordination of research and study on a wide range of aspects of science. Murray would later join the SGS, in 1886, drawn in by an interest in Antarctic exploration, which at the time the Society was actively promoting, and his affinity deepened through bathymetric surveys of Scottish lochs.

The ecological idea and the associated synthetic perspective, which were fundamental features in oceanographical work at this time, were significant in prompting an application of the basically similar viewpoint by geography. Thus many who became prominent members of the geographic community in the UK were involved in work relating to the *Challenger* expedition.

Meteorology

Scotland was again a vital centre for this science, and interest grew as scientific geography became more widely accepted. The discipline of meteorology grew in conjunction with the development of many new meteorological stations and the various scientific expeditions, such as the *Challenger* expedition, which were undertaken at the time. Many graduates of the physical and natural sciences from Edinburgh University were involved in the manning of meteorological sites within the Scottish Highlands.

Natural History

Among the general public at the time there was a growing interest in, and enthusiasm for, natural history and the study of local environments. The stress within natural history on the study of the local environment, and on the significance of the inter-relationships between species of plants and animals within an area, predisposed those involved in much the same way as oceanography did. As geography emerged and gained recognition, so the ties between it and the biological sciences developed. In Scotland, studies of the overall complexity of biological elements within a district were increasingly undertaken, whereas in England more attention was being paid to the individual species and their attributes. Thus in Scotland a keen interest in natural history was fostered, particularly in the local context, and much practical work was undertaken.