

BOOK REVIEW

SCOTLAND'S ENVIRONMENT during the last 30,000 years: Robert Price: Scottish Academic Press, Edinburgh, 1983. pp. 1-203, Price: £ 27.50, Paperback Edition £ 15.

'The present is the key to the past' is a dictum often repeated but surprisingly the study of Quaternary processes has remained neglected compared to other aspects of Earth history. In recent years, especially during the last twenty years, however, there has been a spurt in activity in this field as a result of studies carried out in different disciplines like geology, botany, meteorology, hydrology, physical geography and archaeology.

Scotland, although relatively a small country, continues to be a classical area for geologists with its complex geological and geomorphological history. It was in Scotland that the first effect of glaciation was most lucidly propounded and presented to the outside world by Sir Archibald Giekie. The book under review, 'Scotland's Environment' attempts at a synthesis of the results obtained by a variety of specialists whose work has contributed to our understanding of palaeo-environments. The time period involved in such studies is the last 30,000 years. Human modification of the natural environment also forms an important aspect of the study.

The book appropriately commences with an introduction devoted to a description of the present physical environment and the nature of evidence of the palaeo-environment, the several methods of dating available for dating Quaternary environmental changes, with a brief description of how it has become possible to place British Quaternary environmental changes within the framework of the chronology established by the study of Quaternary sediments in the North Atlantic region.

According to radiocarbon data, the last ice sheet to develop was 27,000 years ago. Palaeo-environmental conditions prior to this period are considered (Chap. 2) followed by an account of the last ice sheet Circa 27000 – 14000 bp (Chap. 3). The lines of movement of the ice sheet, its retreat and downwastage and the landforms and deposits produced are traced. This Chapter should prove to be of interest to students of Himalayan Geology in tracing the development of glacial landforms and the fashioning of scenery.

The subject matter of Chapter 4, the longest Chapter in the book, relates to the late glacial period circa 14000 – 10000 bp. The period represents the most intensely studied in Scotland. Major environmental changes during this episode are based on interpretation of sediments and their included fossils – reliance being placed on pollen grains, macro-vegetation remains, colcoptera and macro and micro marine fauna. Limitations in interpreting fossil evidence and radiocarbon dating and in synthesizing a meaningful pattern are emphasized.

Chapter 5 deals with the early post glacial period, circa 10000 – 5000 bp. The establishment of a temperate environment with a rapid termination of the glacial period, changes in landforms and sea levels, development of soils and recolonization of land by forests, evidence for the occupation of Scotland by early man and his influence on the environment, are then detailed. The mesolithic population is indicated to be dominantly coastal.

Environmental conditions and development of landforms during the last five thousand years is the subject matter of Chapter 6. Difficulty in recognizing minor

changes within a short time span is emphasized. Most significant change is in the transformation of land from forest cover to grassland associated with agricultural and urban land use. Development of the Neolithic bronze age and iron age cultures are shown to have made major impacts on the landscape. Relative fall in sea levels gave rise to marsh lands and raised beaches, providing attractive occupational sites for the Neolithic and bronze age peoples. Major route ways got opened up which is reflected in the modern communication pattern of Scotland.

Changes in landscape are both natural and man made. It is difficult to estimate the extent of the human impact up to 1000 A.D., especially when population was less. Since that date, natural changes have been less important than the activities of man, in changing the scenery of Scotland. Natural disasters occur when human interference deviates from natural processes. The understanding of man's role in modifying the environment is vital in the cause of sensible planning in the future. The description ends with stressing the need for more detailed study of the changes in environment both by natural change and by human impact.

The last chapter (Chapter 7) is devoted to an assessment of the magnitude and frequency of environmental changes. Possibilities of utilizing the limited data on palaeoenvironments to evaluate probable future trends are discussed. Glacial episodes are seen to occur every 100,000 years, with interglacial lasting only 10,000 years. The present interglacial is expected to end in the next four thousand years. It is, however, expected that the burning of fossil fuel and expected increase in CO₂ in the atmosphere may lead to a worldwide increase in temperature making the present interglacial last longer.

The book concludes with emphasizing the need for placing the data so far accumulated within an accurate absolute geochronological framework. It is only then that an understanding is expected to be gained of the rate of changes of both the natural and man made environment. The need for strengthening inter-disciplinary approach in the study of Quaternary is emphasized.

The book is very well got up and forms an excellent general survey of glaciation and its effect on the environment. It is sure to stimulate interest of geographers and geologists involved in problems of development of the present environment.

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