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The Riverscape and the River

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The Riverscape and the River

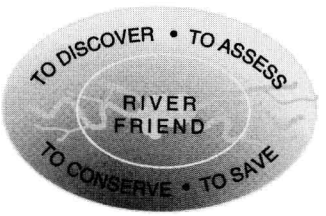
The study of water in the landscape is a new and rapidly expanding field Rivers make riverscapes (even if the rivers are frozen) and riverscapes then determine the rivers: except for the ever-increasing human impact. Dr Haslam examines how the quantity, function and ecology of water changes as it moves from watershed to river. The development of river and riverscape, their ecology, the effect of human activities (such as water abstractions, flood control and management for recreational use) and water resources are described both in principle and using case histories. Contrasting examples are given from across the world, including Iceland, Hungary, Malta, Britain and the USA, which enables understanding of how water and riverscape interact with each other, and with human impact. The study, development and loss of water resources is also described, including the extreme example of Malta, whose clean water now depends solely on oil imports. This innovative book is aimed at undergraduate and graduate students and professionals, but is also accessible to anyone interested in how water and riverscape interact.

DR S. M. HASLAM is a fresh water ecologist in the Department of Plant Sciences at Cambridge University.

To: Mr H. W. Haslam and Mrs J. M. Psaila who (more than others) drove the author hither and drove her thither, in England and Malta, respectively, so that she could study the riverscapes.

Thou makest springs gush forth in the valleys,
they flow between the hills,
they give drink to every beast of the field; . . .
the earth is satisfied with the fruit of Thy work.

Ps.104



Preface

The study of landscape ecology has developed rapidly in the past two decades, though the limited area of riverscape has not received great attention as such. This book attempts to link river and riverscape in an integrated whole. It has more ecology (natural, cultural and historical) and less mathematics and modelling than is currently usual: reflecting my interests, and my preference for observation and synthesis.

I have worked for over 35 years on rivers, mostly on their vegetation, waters, channels and other contents. More recently I realised the interest of the wider ecosystem, of the river and the riverscape being inextricably joined, both by the water they share, and by the human impact (some interesting, most destructive) inflicted upon them. Changes have been made to allow people to survive, and indeed to live pleasantly. Great changes have also been made from ignorance or greed to remove and contaminate both water and natural heritage. *The Riverscape and the River* tries to reflect the interest and diversity of that natural heritage, and what has been done to it down the ages.

The book is primarily about Europe (with a little on North America).

S. M. H.
September 2006

Acknowledgements

I am most grateful to the many people who have helped with this book. I would single out particularly those driving me on field work, Mrs T. Bone, Artist and Desktop Publisher, for the preparation of the manuscript and turning sketches into publishable figures, and Mrs P. A. Wolseley and Mrs Y. Bower for permission to use figures drawn previously. My debt to Mrs Bone is even greater than usual, because my injuries left me, for a long time, writing even worse than before. Typing this script required uncommon skill and patience. The list of those who have helped with references, information permissions and in the field is long: my most grateful thanks go to all. Ms A. Imlash (RSPB, Farsinard) most kindly provided the photographs. Some picture postcards, several or many decades old, have been reproduced.

Finally, I would like to thank the publishers for their patience, waiting for me to recover from concussion caused by a continental lorry driver not knowing he had a 'blind spot' on English motorways.

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We belong to a time as well as a landscape

(Storey, 1993)

We seek order out of chaos.
The more we discern, the less we seem to know.

(Bell, 1997)

Rivers . . . were made for wise men to contemplate, and for fools to pass by without consideration.

(cited in Walton, 1653)

Introduction

The riverscape and the river share the sheet of water which covers the land: in whole or part, permanently or intermittently. The river is a stream of water flowing along a bed in the earth, to the sea (lake or river). The riverscape is that part of landscape which has (or had) a watercourse as its focus. Rain falls upon the riverscape. Some evaporates, some sinks below, gradually emerging as springs or flushes, and (usually) most runs down the slope, gradually collecting into the rivers and finally the seas. The hydrological cycle is finished by the evaporation of sea (and fresh) water into the air, and its precipitation back on the earth's surface.

Seeing that life on earth is based on water, and life on land, on fresh water, the river is essential to land life, as well as river life. The riverscape and, to a considerable extent all that grows on it or is put on it, depends on the river, since the river (or the ice-river of a precursor glacier) first formed the riverscape. The two are interdependent, both are modified by human impact (even in Antarctica, e.g. air and sea pollution, and climate change), and both are natural capital,

hence natural resources for people. They thus come from the interaction of natural elements such as flowing water and rising hills, and the interaction with these and the cultural dimension and its diversity. They are live archives, demonstrating the management of natural resources such as water and soil (Andressen & Curado, 2001).

The valley, according to *Chambers Dictionary*, is a stretch of country watered by a river, an elongated hollow between hills. How much can be seen, what is seen, and how it is seen, varies with the point of observation. From the river, looking out, the riverside grades up the slope, giving a fairly enclosed view, from large (to hills beyond) to small (the riverside bushes). The viewpoint can move anywhere up slope to the hill top, where the view is generally wide and open, and the overall pattern (not the river detail) can be seen better. Aerial photographs, of course, give a yet different view of the river basin. All are equally true, all showing different facets of the riverscape and river.

Riverscapes have three characters: structure, function and change.

Structure

Passing from centre outwards, first the size, shape, pattern of:

- the river and of what grows in it;
- the riverside, narrow or wide, what grows on it (e.g. wood, flooded wetland, grass, crops) and what has been put on it (e.g. houses, mills, wharfs, roads, towns, telephone wires);
- the land beyond, which may usually rise to well-marked hills or continuing lowland, or even flood plain for the extent of the riverscape view. This also has much put upon it, both vegetation and the associated animals. These may be native plants, varying from large, like trees and forests of oak, pine and so on, to small, like daisies or mosses. They may be meadow or pastures of traditional, rather than of native species. They may be agricultural crops, like cabbage or barley.

The underlying structure of topography and geology, soil and water has on it (and in it) the natural structure of vegetation, and the imposed structures of people, from isolated farms nestling in valleys to great port towns, from pilgrims' ways to radio-lines for mobile telephone masts, from canals to deep abstraction boreholes and sewage treatment works.

Function

The river and riverscape function in their own right, in the hydrological cycle and in the consequent perpetual erosion of the land and sedimentation of the sea: until the next earth movements! In the course of this, water, wetland, damp and dryland habitats appear, in which plants – and animals and

micro-organisms – can grow, spread and develop. For the past 800,000 years they have also functioned for people, to provide food, shelter, clothing, communications and much more (Table 1.1).

The river and riverscape are the basis of the human environment. They bear the plants and animals needed by people, and these are in communities influenced by people (e.g. Vink, 1983). They are working entities, places of many processes.

Change

Nothing on earth is permanent, but the scale of change varies from the long-term erosion of mountains to the short-term flood.

Interpretation

Nature, culture and history are complex, complex in themselves, and complex in their inter-relations. Few people can see and understand all, at one time. This author can visit a riverscape to look at one of (say):

river plants and channel
wetlands near rivers
river cultural patterns, past and present
settlement patterns
landscape elements
communications, for biota and people
heritage, visible and invisible.

These and more can be studied and (often) understood. But this author's head has difficulty in seeing and assessing two of these on one visit, and finds it impossible to see and interpret all. The same site yields quite different material, depending on the purpose of the visit. This factor underlies all such field study. The human brain is limited, while nature, culture and history are not – in the present state of knowledge.

Many different aspects and perceptions of river and riverscape can be, and have been, developed. Each brings out or enhances a different facet. Difficulties arise only when like is not compared with like, or when someone asserts there is only one method right and true. Looking at connectivity, for instance, that for surface water and that for the movement of herons may overlap, since both include shallow water, but the two patterns differ in content, in solidity, in time and, of course, in purpose. To call either or indeed both *the* connectivity of the riverscape is incorrect (what about hedges, woods, deer, badgers, otters, dragonflies, water lilies, roads, telephone lines . . .?) To use any to interpret part of the surface pattern is valuable. It would take a lifetime to work out total