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Book Review: Late Glacial and Holocene history of vegetation in Poland based on isopollen maps

Brigitta Ammann

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A history of the native woodlands of Scotland, 1500–1920

T.C. Smout, Alan R. MacDonald and Fiona Watson, Edinburgh: Edinburgh University Press, 2005, 434 pp., £60.00, hardback. ISBN 0-7486-1241-6

This important contribution to our knowledge of Scottish woodlands is more than just a book about Scottish woods. In Scotland, as elsewhere in Europe, the existence, structure and composition of woodlands are the products of many centuries of human impact. This book expertly charts this pathway, clearly demonstrating the essential prerequisite of understanding woodland history before any serious attempt can be made at the sustainable management of native woodlands. That said, many non-Scottish readers will be baffled by terms such as feuing, sennachies, shielings and farmtouns, which are not explained in the text.

The introduction focuses on defining the impact of different woodland exploitation models. This sets the scene for the book, which the authors stress is about the human use of woods rather than their natural history or ecology. A revision of the overall estimates of Scottish woodland cover suggests that major clearances had occurred before the Romans arrived, and by AD 1750 woodland cover was just less than 10%, falling to about 3% by 1900. The authors repeatedly demonstrate why it is essential to refer back to original sources rather than relying on more accessible secondary sources; this point is particularly revealing in their sections on cartography.

In following the chronological history, the book addresses specific impacts such as timber extraction, charcoal and tanbark industries, and grazing. It also highlights the distinction in the exploitation, and hence history, of the broadleaved woods compared with the Caledonian pinewoods. Considerable detail is packed into the 400 pages, with numerous references to primary sources. This book is far from being a dreary monologue, however, and the authors must be congratulated for sustaining the prose to maintain the reader's interest. One chilling example of this detail is the description of the punishment metered out to some children who had their ears nailed to a gallows for setting fire to pinewoods near Nethybridge in 1695.

This painstaking and careful research shows how the fate of Scottish woodlands was inextricably tied to the national economy. Just as today, land-owners had little room for manoeuvre when it came to the exploitation of their woodland resource. The charcoal and tanbark industries ensured the sustainable exploitation of many western woods, while the Napoleonic wars reduced the prospect of imports and also ensured the sustainable management of the timber resource. It is perhaps ironic that the conclusion of the Napoleonic wars made timber imports easier and so the value of oak coppice was reduced and management relaxed. Land became more valuable as pasturage which led to significant woodland decline. The authors conclude that over the history of Scottish woodlands, sustainable management was more likely in the commercial sector than the subsistence sector. They also go to some length to demonstrate that the destruction of Scottish woodlands was primarily an indigenous activity rather than the widely perceived notion of foreign exploitation.

The book concludes with four case studies of woods in Rothiemurchus, Strathcarron, Glenorchy and Skye. The local focus here again emphasizes the overriding influence of economics on woodland history and serves to demonstrate the fascinating level of detail available in the archives.

Fraser J.G. Mitchell
(Trinity College Dublin)

Late Glacial and Holocene history of vegetation in Poland based on isopollen maps

Edited by Magdalena Ralska-Jasiewiczowa, Malgorzata Latałowa, Krystyna Wasylkowa, Kazimierz Tobolski, Ewa Madeyska, Herbert E. Wright and Charles Turner, Krakow, Poland: W. Szafer Institute of Botany, Polish Academy of Sciences, 2004, 444 pp., €98.00, hardback. ISBN 83-89648-23-7

In the twenty-first century a new interest in tree migration has arisen from questions such as 'how fast can trees migrate?', asked in a global change context. Since migration is one of only three options organisms have to respond to rapid climatic changes (ie, adaptation, migration or extinction), knowledge of potential migration rates may be important. Contributions from pollen analysis and palaeoecology can answer the question of potential velocity even for species with long generation times, such as trees. There are two ways to show tree migration on maps. In 1935 Władysław Szafer first published maps presenting isopollen lines joining points of identical pollen percentages (Szafer, 1935). The approach was later taken up by many authors for various spatial scales (eg, Birks *et al.*, 1975; Birks and Saarnisto, 1975; Huntley and Birks, 1983). A map is needed for each time interval presenting the pollen percentages for that period, with its dating uncertainties. Subsequently, with better time control of the terrestrial records, isochrone maps became possible, in which lines of synchronous arrival of a taxon are shown. Good examples for the British Isles and discussions of the delicate issue of presence or absence based on pollen percentages are given by Birks (1989) and Birks and Birks (2000).

This book, presenting new isopollen maps for Poland, is a wonderful, up-to-date synthesis for the country that probably has the largest and most spatially dense palynological data base. The Polish Pollen Data Base (PPDB) has more than 250 pollen diagrams from an area of more than 312 000 km², of which 190 were considered useful for the isopollen maps in this book. Five introductory chapters and five synoptical chapters towards the end of the book frame the central core of 24 chapters on woody taxa and 15 chapters on selected herb taxa. Each taxon is presented as a sequence of maps arranged in time steps of 500 years.

After an introduction by Magdalena Ralska-Jasiewiczowa about the motivation, the network of authors and the use of radiocarbon dates throughout the book, a chapter on 'Present-day natural environment of Poland' by Krystyna Wasylkowa summarizes edaphic, climatic and plant-geographical data in a concise and well-illustrated way. A chapter by Magdalena Ralska-Jasiewiczowa on the 'History of mapping palynological data' reviews the development of scientific approaches and leads to two chapters by Dorota Nalepka and Adam Walanus on methods. First, the methods used for constructing the isopollen maps are summarized, including: (1) harmonization of taxonomy and nomenclature of the pollen types from all sites (performed before data are stored in the PPDB); (2) storage of numerical data in POLPAL (Walanus and Nalepka, 1999) and related storage of descriptive data about each site; (3) uniform pollen sum for calculating pollen percentages; (4) problems with using percentages (ie, closed data); (5) selection of time-slices; and (6) methods for drawing the maps with algorithms (eg, for weighting the influence of sites by distance). Two types of maps are presented. For taxa or periods with very low occurrences, dot-maps show percentages, but most maps show occurrences and periods with medium to high values presented as isoline maps in colour. The second methodological chapter, by Adam Walanus and Dorota Nalepka, discusses

the possibilities and problems of calibrating the time horizons used in radiocarbon years for the maps.

The bulk of this substantial book is dedicated to the isopollen maps and their texts, which represent a great treasure of information. The maps are arranged in time steps of 500 radiocarbon years. Many authors have contributed to this fine collection of short chapters on both woody plants (from *Abies* to *Vitis vinifera*) and herbaceous taxa (from *Artemisia* to *Typha latifolia*). The clear and consistent structure of these chapters makes the information easily accessible: present distribution of the taxon (in Europe and in Poland); autecology; pollen production and dispersal; expansion in Europe during the Lateglacial and the Holocene; and migration patterns in Poland. Tree migration is a phenomenon of wide interest, but herb species are also fascinating – for example, the contrasting histories of taxa such as *Artemisia* or *Secale*.

The five concluding chapters offer a synthesis in five time slices (Lateglacial, early, middle, late Holocene, and late Holocene during increasing human impact). These concise chapters, in addition to the comments to the atlas section, make a large Polish literature on vegetation history and palaeoecology accessible to those colleagues not able to read Polish. The careful comments also show where more research is needed, even in a country as well studied as this important part of central Europe. This book is a remarkable accomplishment from a co-operative group of scientists and is a pleasure to read.

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Brigitta Ammann
(University of Bern, Switzerland)