Preface

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Igneous rocks are usually highly unfossiliferous but, somewhat paradoxically, volcanogenic deposits may yield exceptionally well preserved fossils because of the processes locally associated with volcanism. One particular site, East Kirkton, Bathgate, Scotland, has recently yielded a cross-section of an early Carboniferous terrestrial community. The rocks are of Brigantian, upper Viséan age (335 million years old) and comprise almost 15 metres of limestones, shales, cherts and tuffs in the West Lothian Oilt-Shale Formation. Plate reconstruction suggests this region was then situated just south of the equator, in a continental rift zone. Although the volcanogenic and hot-spring associations of this site have been appreciated since the early 19th century, and occasional fossils were found, it was not until 1984 that a series of tetrapods and other terrestrial fossils were found by the commercial collector, Stanley P. Wood. Many of these are the earliest proven terrestrial records of their group, including diplopod millipedes, scorpions, and a harvestman spider. The tetrapods, which include a new stem-reptile Westlothiana, shed new light on the ecology of vertebrate evolution. They provide early evidence of a fauna of fully terrestrial tetrapods, in contrast to those of other Carboniferous sites. Exceptionally preserved plants are also found at this site.

By their very nature, terrestrial fossil assemblages are rare in the geological column; East Kirkton is unique in revealing such a fully terrestrial biota from the Lower Carboniferous. A bed-by-bed systematic sampling of the site was carried out by a team from the National Museums of Scotland, to investigate the sequential changes in the biota. The finds, and a detailed stratigraphic log, were distributed to researchers at other institutions. To discuss the significance of this recently discovered biota, its relation to the enclosing rocks and the relevance of similar situations elsewhere, a three-day meeting was organised by The Royal Society of Edinburgh and The National Museums of Scotland. Symposium sessions were held on: Volcanic Setting and Activity; the Biota; Taphonomy and Palaeoecology and Comparable Biotas. The organising committee was E. N. K. Clarkson, A. J. Hall, A. R. Milner, A. L. Panchen, R. L. Paton, F. W. Robertson and W. D. I. Rolfe (Convener), supported by Society staff Sandra McDougall (Meetings Secretary), Paula Couts and Tracey Dart (Publications Manager).

The meeting was held at the Society’s apartments 23–25 September 1992, and opened with a speech of welcome by the President, Sir Alastair Currie. In addition to a full programme of 25 papers and discussions a poster session was held, and a laboratory demonstration of key material, brought to the meeting by researchers, took place at the Royal Museum of Scotland, Chambers Street, Edinburgh on the evening of 23 September. The Conference Dinner, held in the Wellcome Room of the Society on the evening of 24 September, was addressed by Stan Wood. A field excursion, led by A. Scott, A. Hall and W. D. I. Rolfe, concluded the meeting on 26 September. Courceyan (Tournaisian) volcanogenic permineralised floras were seen at Oxroad Bay, East Lothian and the East Kirkton site was later visited. This excursion was generously sponsored by West Lothian District Council, who also entertained delegates to lunch. The latter followed a brief ceremony at Bathgate’s new Steelyard pedestrian precinct, where Professor Bob Carroll of McGill University, Montreal, unveiled a sculptured plaque reconstructing East Kirkton in Lower Carboniferous times.

The main funding for the meeting and this publication was provided by The Royal Society of Edinburgh and The National Museums of Scotland. Welcome additional support for the publication was given by Scottish Natural Heritage and Livingston Development Corporation. Generous grant-in-aid from The Royal Society, London, enabled a number of young scientists to attend the meeting. All these institutions are thanked for their support. Total attendance, which included many workers from overseas, was 76. A fuller synopsis of the meeting can be found in the account by T. R. Smithson (Palaeontology Newsletter 17, 1993, 23–6).

Papers presented at the meeting were modified in the light of subsequent discussions before being submitted for publication in this volume, which was edited by E. N. K. Clarkson, A. L. Panchen and the writer.