

# Earth and Environmental Science

## Transactions of the Royal Society of Edinburgh



volume 108 part 1 2018  
(for 2017)

## Special Issue

A Legacy  
in  
Fossils:  
a Tribute  
to  
Stan Wood

Published by The RSE Scotland Foundation, 22–26 George Street, Edinburgh EH2 2PQ



The Royal Society of Edinburgh is committed to the widespread dissemination of scientific knowledge and has published the *Transactions of the Royal Society of Edinburgh* since 1785, when James Hutton's 'Theory of the Earth' was published in Volume 1. The journal evolved to the *Transactions of the Royal Society of Edinburgh: Earth Sciences* in 1980 and is now (as from 2007) the *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*. Through this journal, the Society continues to encourage and support the international Earth and Environmental Science communities by:

- publishing a journal of international standing and authorship;
- publishing substantial papers on all scientific aspects of **the Earth and its surface environments**;
- publishing without page or colour charges;
- reproducing photographs and artwork to the highest standard, where appropriate at a size larger than is customary; and
- aiming to have papers reviewed within three months by at least two referees of international standing; and usually publishing within six months of acceptance.

**The Editorial Board welcomes original manuscripts in the Earth and Environmental Sciences. It also welcomes proposals for Special Issues in these areas.**

**Editorial Board (as at 31 July 2018)**

Donald DAVIDSON (*Chairman & Editor-in-Chief*), University of Stirling  
*Soil science; soil conservation; anthropogenic impacts on soils; soil biodiversity; geoarchaeology*

Kevin EDWARDS (*Editor*), University of Aberdeen  
*Environmental change in northern Europe & North Atlantic; Palynology; palaeoecology; Quaternary science; environmental archaeology*

Tony FALLICK (*Editor*), University of Glasgow  
*Isotope biogeosciences; economic geology; dating & geochronology; the Palaeoproterozoic & Neoproterozoic*

John GORDON (*Editor*), University of St Andrews  
*Geodiversity; geoconservation; Quaternary research*

Alistair MCGOWAN (*Editor*), BioGeoD, Edinburgh  
*Palaeobiology; biodiversity; invertebrate palaeontology; the Fossil Record*

Andrew ROSS (*Editor*), National Museums Scotland, Edinburgh  
*Invertebrate palaeontology; palaeobiology; palaeoecology; palaeoenvironment; palaeoclimate*

Philip STONE (*Editor*), British Geological Survey, Edinburgh  
*Scottish and South Atlantic regional geology and tectonics*

Stig WALSH (*Editor*), National Museums Scotland, Edinburgh  
*Vertebrate palaeobiology; vertebrate palaeontology*

Alan WERRITTY (*Editor*), University of Dundee  
*Water resources & climatic change; flood hydrology & geomorphology; river sediments; geomorphic sensitivity; history of geography*

*Journals & Archive Officer: Royal Society of Edinburgh: Mrs Vicki M. Hammond (to 17 August 2018)*

**COPYRIGHT:** It is the policy of the Royal Society of Edinburgh not to charge any royalty for the production of a single copy of any one article made for private study or research. Specific permission will not be required for photocopying multiple copies of copyright material, to be used for *bona fide* educational purposes, provided this is done by a member of the staff of the university, school or other comparable institution, for distribution without profit to student members of that institution, and provided the copies are made from the original journal. Requests for the copying or reprinting of any article for any other purpose should be sent to the Journals & Archive Officer at the Royal Society of Edinburgh. (publications@therse.org.uk).

*Earth and Environmental Science Transactions of the Royal Society of Edinburgh* is published as one volume of four parts per year, usually in a combination of single and double issues. Volume 108 (2017) will provisionally be published in three parts – one double issue and two single issues.

An annual subscription to *EESTRSE* costs GBP362/ USD663 (Print plus Online); or GBP314/ USD582 (Online only).

Orders should be placed with Cambridge University Press, Journals Fulfilment Department, UPH, Shaftesbury Road, Cambridge CB2 8BS, UK. Telephone: 44 (0)1223 326070; Fax: 44 (0)1223 325150; email: journals@cambridge.org

*EESTRSE* is indexed/abstracted in the following: Current Contents/Physical, Chemical & Earth Sciences; Biosciences Information Service; Geoabstracts; GEOBASE; Mineralogical Abstracts; Science Citation Index; SciSearch; VINITI (All-Russian Institute of Scientific and Technical Information); *Zoological Record*.

© 2018 The Royal Society of Edinburgh

The Royal Society of Edinburgh, Scotland's National Academy, is Scottish Charity No. SC000470

**Cover images (clockwise from top):** Restoration of *Westlothiana lizziae* (© Karen Carr Studios); *Balanerpeton woodi*, NMS G.1985.4.1 (© National Museums Scotland); Restoration of *Balanerpeton woodi* (© Karen Carr Studios); *Westlothiana lizziae*, NMS G.1990.72.1.1 (© National Museums Scotland); *Akmonistion zangerli*, HMV 8246 (© The Hunterian, University of Glasgow, 2018); *Pulmonoscorpius kirktonensis*, NMS G.1990.78.1 (© National Museums Scotland); unnamed tetrapod foot, UMZC 2011.8 (© University Museum of Zoology, Cambridge).

A Legacy  
in  
Fossils:  
a Tribute  
to  
Stan Wood

*Editors*

Nicholas C. Fraser, Timothy R. Smithson  
&  
Jennifer A. Clack



# CONTENTS

Nicholas C. FRASER, Timothy R. SMITHSON and Jennifer A. CLACK A Legacy in Fossils: a Tribute to Stan Wood – Preface	1
Timothy R. SMITHSON and W. D. Ian ROLFE What made Stan Wood a great collector?	7
Michael I. COATES and Kristen TIETJEN The neurocranium of the Lower Carboniferous shark <i>Tritychius arcuatus</i> (Agassiz, 1837)	19
Jennifer A. CLACK, Laura B. PORRO and Carys E. BENNETT A <i>Crassigyrinus</i> -like jaw from the Tournaisian (Early Mississippian) of Scotland	37
Margaret WOOD Glencarholm revisited: describing for the first time Stan Wood's discovery and excavation of Mumbie Quarry, adjacent to the important Palaeozoic fossil site of Glencarholm	47
Donglei CHEN, Yasaman ALAVI, Martin D. BRAZEAU, Henning BLOM, David MILLWARD and Per E. AHLBERG A partial lower jaw of a tetrapod from "Romer's Gap"	55
Kelly R. RICHARDS, Janet E. SHERWIN, Timothy R. SMITHSON, Rebecca F. BENNION, Sarah J. DAVIES, John E. A. MARSHALL and Jennifer A. CLACK Diverse and durophagous: early Carboniferous chondrichthyans from the Scottish Borders	67
Timothy R. SMITHSON and Jennifer A. CLACK A new tetrapod from Romer's Gap reveals an early adaptation for walking	89
Andrew J. ROSS, Gregory D. EDGECOMBE, Neil CLARK, Carys E. BENNETT, Vicen CARRIÓN, Rubén CONTRERAS-IZQUIERDO and Bill CRIGHTON A new terrestrial millipede fauna of earliest Carboniferous (Tournaisian) age from southeastern Scotland helps fill 'Romer's Gap'	99
John A. LONG and Kate M. TRINAJSTIC A review of recent discoveries of exceptionally preserved fossil fishes from the Gogo sites (Late Devonian, Western Australia)	111