

Extinctions: crises in the history of life

Start date 12 June 2020 **End date** 14 June 2020

Venue Madingley Hall Madingley
Cambridge
CB23 8AQ

Tutor Dr Peter Sheldon **Course code** 1920NRX050

Director of ISP and LL Sarah Ormrod

For further information on this course, please contact the Lifelong Learning team Zara Kuckelhaus, Fleur Kerrecoe
shortcourses@ice.cam.ac.uk or 01223 764637

To book See: www.ice.cam.ac.uk or telephone 01223 746262

Tutor biography

Dr Peter Sheldon is an Honorary Associate in the School of Environment, Earth and Ecosystem Sciences at the Open University, where he was a Senior Lecturer in Earth Sciences. He has given over 80 residential courses in geology, palaeontology and evolution for the University of Cambridge Institute of Continuing Education since 1979. He also teaches for the Cambridge International Summer Programme. From 2008 to 2011 he was External Examiner for Scientific Studies at Oxford University's Department for Continuing Education, where he has given over 40 day-schools. His teaching style combines fieldwork, hands-on study of real specimens of rocks, minerals and fossils, and interactive lectures.

Dr Sheldon chaired the Open University course on *Geology* and has contributed to many other OU courses, including *Fossils and the History of Life, Evolution, Earth's Physical Resources, Discovering Science, The Geological History of the British Isles* and *Earth Science*. He is well known for research on evolutionary patterns in the fossil record and the relationship between evolution and environmental change.

Course programme

Friday 12 June 2020

Please plan to arrive between 16:30 and 18:30. You can meet other course members in the bar which opens at 18:15. Tea and coffee making facilities are available in the study bedrooms.

- 19:00 Dinner
- 20:30 – 22:00 **Session 1: Early ideas on extinction and an introduction to fossils. Very ancient crises in the history of life.**
- 22:00 Terrace bar open for informal discussion

Saturday 13 June 2020

- 07:30 Breakfast
- 09:00 – c.9.45 **Sessions 2, 3 & 4: 45-minute talk followed by field excursion to at least one local quarry.**
- Please bring stout footwear (essential; preferably walking boots (to give good ankle support), or wellington boots), waterproof clothing in case of bad weather, and, if you wish, a thermos flask which can be filled at breakfast.*
- N.B. See also 'Equipment required' and 'Level of fitness required for the field trip'.*
- A packed lunch will be provided.
- Return by 17.30
- 18:30 Dinner
- 20:00 - 21:30 **Session 5: Extinctions in the Palaeozoic and Mesozoic Eras. Mass extinction by meteorite impact at the end of the Cretaceous Period?**
- 21:30 Terrace bar open for informal discussion

Sunday 14 June 2020

- 07:30 Breakfast
- 09:00 – 10:30 **Session 6: Practical session - yesterday's finds and other fossils of extinct species.**
- 10:30 Coffee
- 11:00 – 12:30 **Session 7: Extinctions in the Cenozoic Era. The role of humans in extinctions. What might the future hold?**
- 12:45 Lunch
- The course will disperse after lunch**

Course syllabus

Aims:

1. Provide a wide-ranging, practical introduction to extinct species and extinctions, including first-hand experience of fossils in the field and teaching room.
2. Stimulate a continuing interest in palaeontology and the history of life.
3. Give course members sufficient basic understanding to enable them to begin to pursue an interest in extinct species and extinctions for themselves.

Content:

This course offers a wide-ranging introduction to extinction, one of the most important and intriguing aspects of the history of life. Extinction – not just loss of life but loss of genes – is forever. The evidence for extinction isn't hard to find. If we go out and look in some of the quarries near Cambridge we can discover fossils of organisms such as ammonites, ichthyosaurs and mammoths that were thriving long ago. Yet these animals and a host of countless others cannot be found alive anywhere in the world today. What happened to them? How did these groups meet their end? Were they victims of a sudden catastrophe or a gradual demise? And how can we tell?

There appear to have been several times when more than half of all the Earth's species disappeared rather abruptly. In some mass extinctions, is survival mostly a matter of chance: more good luck than good genes? We shall briefly discuss possible extinction mechanisms and assess the evidence relating to some of these hotly-debated issues. And what of human influences on nature? Just how rapidly are species going extinct today as a result of our activities? Are we witnessing part of another mass extinction? Would it be ethically right to resurrect a species like the woolly mammoth, if fossilised genetic material allowed us to do this?

An important part of the course will be the chance to collect fossils of extinct species on a field trip.

N.B. Level of fitness required: Participants will at times need to be able to walk continuously for about 15-20 minutes within a quarry and over very rough and quite steep ground for short distances.

No previous background in palaeontology or geology is needed for the course, and no reading is required in advance

Programme: Please note that the field trip on Saturday may be subject to modification, depending on weather, state of the quarry and so on.

Presentation of the course:

The course will employ a wide variety of teaching and learning methods, including a field excursion, interactive lectures with slides, and the opportunity to pick up and personally examine a large number of fossils put out on tables in the teaching room. On Sunday morning, participants are invited to put out their own specimens found on the excursion, so that everyone can examine, identify and learn from each other's finds.

As a result of the course, within the constraints of the time available, students should be able to:

- 1 Identify some of the common types of extinct life found in the fossil record.
- 2 Name a few mass extinction events, giving examples of organisms that became extinct.
- 3 Outline some of the mechanisms that may have been responsible for mass extinctions.
- 4 Discuss the difference between local and global extinction and comment on the role of humans in extinctions.

Equipment required:

Warm and waterproof clothing — **ESSENTIAL**. Please note that quarries stipulate that, for safety reasons, shorts or skirts should not be worn.

Walking boots (preferably, as they support your ankles) or wellington boots — **ESSENTIAL**.

N.B. Ordinary walking shoes or trainers are *not* acceptable. Quarries are nearly always wet and muddy in places, and adequate foot protection is required within working areas, near machinery, etc. Bear in mind that wellington boots can be rather hot to wear in summer (compared with walking boots).

Thermos flask — you might find this to be a good idea.

Notebook, pen, pencil, rubber.

Hand-lens (optional) — you'll find your enjoyment and understanding of fossils and rocks increases if you have a hand-lens. Some hand-lenses should be available for purchase from Peter Sheldon for only £2 during the course. Hand-lenses can be also bought from stamp shops (philatelists) and some hobby shops. Magnification x 10 is recommended.

Plastic bags (a few strong, medium-sized shopping bags); paper — to wrap specimens.

A geological hammer (optional) — if you have one, it could be useful; otherwise we will lend a few to share for the trip. Much study can be done without one and there is **NO** need to obtain a geological hammer for the course. (Note that an ordinary hammer should *not* be used to break open rocks; the metal is too brittle and metal chips may fly off.)

N.B. In addition to suitable footwear (see above), visitors to quarries have to wear standard safety helmets and high-visibility waistcoats. We will supply these items on loan.

Reading

No reading is required in advance and no books need to be bought (or consulted) for the course. Many useful books on extinction, evolution, geology and palaeontology will be available for people to look at during the weekend, and a detailed and extensive booklist will be provided.

Probably the best fairly recent book on extinctions (especially mass extinctions) for the beginner and those with some background is *The Great Extinctions: What Causes Them and How They Shape Life* by Norman MacLeod. (2015). Full colour. 208 pp. Published by Firefly (but originally published by The Natural History Museum in 2013). ISBN 978-1770853270. £19.10.

Website addresses

Among the many excellent websites you may wish to explore if you have access to the Internet are the following, which have links to a vast number of other relevant sites:

<http://www.nhm.ac.uk> - The Natural History Museum, London.

<http://www.ucmp.berkeley.edu> - Many exhibits and palaeontology/evolution links.

<http://www.si.edu> - The Smithsonian Institution.

<http://www.amnh.org> - The American Museum of Natural History.

<http://www.geolsoc.org.uk> - The Geological Society of London.

<http://www.bgs.ac.uk> - British Geological Survey.

Additional information

Venue

Details of how to find Madingley Hall can be found on our website:
<http://www.ice.cam.ac.uk/who-we-are/how-to-find-the-institute>

Refreshments

Tea and coffee and lunch will be provided. If you have any specific dietary requirements or allergies and have not already advised us, please inform our Admissions Team on ice.admissions@ice.cam.ac.uk or +44 (0)1223 746262.

Note Students of the Institute of Continuing Education are entitled to 20% discount on books published by Cambridge University Press (CUP) which are purchased at the Press bookshop, 1 Trinity Street, Cambridge (Mon-Sat 9am – 5:30pm, Sun 11am – 5pm). A letter or email confirming acceptance on to a current Institute course should be taken as evidence of enrolment.

Information correct as of: 30 January 2020