

WEGA

NEWSLETTER



Geology in the Bristol Area

No 51

NEW WEGA secretary:

It is a pleasure to announce that Bobby Oliver has filled the position of WEGA secretary. Bobby has had long association with WEGA, having attended field trips with her mother Lucy Cleave, who was a founding WEGA member.

Field Trips

WEGA field trips have been limited due to the field secretary position being vacant. WEGA Members have reciprocal arrangements for field trips organised by Bath Geological Society, some details of which are listed below:

Saturday March 31st - Steve Hannath,
The Cathedral Rocks - the Earth materials used in the construction of Salisbury Cathedral
Booking essential email: (chairman@bathgeolsoc.org.uk) - numbers limited

Saturday May 26th - Bruce Buswell,
The layout and plants of Stourhead are largely explained by the underlying geology

Saturday 7th July - Dave Green
Geology and Landscape evolution of the Monnow Valley

Saturday 8th September Dr. David Workman
Geology and Mining in the High Littleton - Camerton area

Friday 12th October - Dr. Gill Odolphie
Somerset Earth Science Centre and visit to Moon's Hill Quarry

Further details are available on the Bath web site at <<http://www.bathgeolsoc.org.uk/>> or from the Field Trips Secretary, Email field@bathgeolsoc.org.uk (01249) 813628 or 443019

WEGA members are covered on a group basis by Public Liability Insurance and for member-member injury, Personal Accident Cover should be individually arranged if required. Participants on our field trips are required to read, sign and follow the excursion safety information which is available on the website and on excursions.

News from Bristol Nats, Geology section:

The indoor meetings are now scheduled for the 4th, or last Wednesday, of October, November, January, February and March to avoid clashes with WEGA talks. Non-Bristol Nats members of WEGA may attend up to two meetings before being expected to join, and if WEGA members do attend, please indicate so on the signing-sheet.

Bristol Nats Geology meetings are held in the S H Reynolds lecture theatre, Wills Memorial Building, and the next meeting is:

Wednesday 22 February, 19:30

Rachel Warnock, Bristol University. Understanding the diversity and evolution of life through time: integrating geology, palaeontology and molecular biology.

Full meeting details are available on the Bristol Nats website

<<http://www.bristolnats.org.uk/bulletins>>, with current information on the blog

<<http://geology.winpenny.org.uk/#home>>.

Remaining dates for the WEGA 2011 – 2012 Session

7th February

Prof Paul Wright (British Gas)

Compton Martin Carboniferous fauna helps us re-think the marine fossil record

Paul's talk on the Compton Martin local fauna examines a set of lagerstätten ("storage place" which is a sedimentary deposit that exhibits extraordinary fossil richness or completeness) that has allowed a radical re-appraisal of marine faunas, taphonomy and even carbonate sedimentology.

13th March

Dr Cherry Lewis (Bristol University)

Medical origins of the Geological Society

Cherry's interests lie in the history of geology and she has published a popular science book on the history of dating the age of the Earth: 'The Dating Game: One Man's Search for the Age of the Earth'. Cherry's talk will cover the origins of the Geological Society of London, which was founded on 13 November 1807 – the oldest such society in the world. Founding members include James Parkinson who gave his name to Parkinson's Disease.

24 April

Annual General Meeting

WEGA AGM

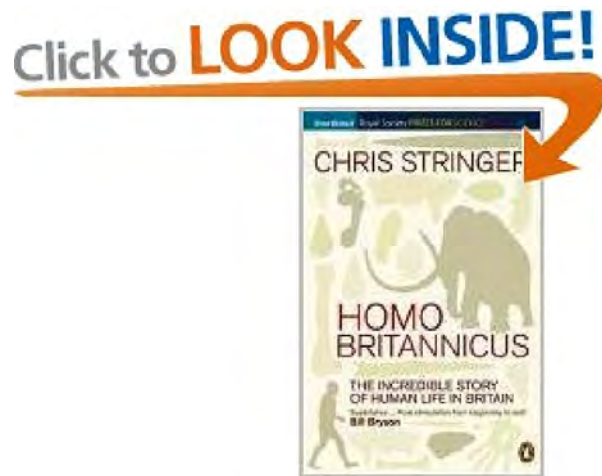
The AGM for 2012 will be held on Tuesday April 24th at 19:30 in the Reynolds Lecture Theatre, Wills Memorial Building, University of Bristol.

The present committee members shown below, will retire as normal at the AGM, with those willing to be re-elected shown

Doug Robinson	Chair	available for re-election
Roy McIntyre	Vice-chair	“
Bobby Oliver	Secretary	“
Judith Hible	Treasurer	“
Vacancy	Field secretary	
Vacancy	Membership secretary	
Phil McHenry	Webmaster member	“
Vacancy	Newsletter editor	
Gloria Castle	Member	“
Ian Donaldson	Member	“
Elizabeth McIntyre	Member	“
Fflyff McLaren	Member	“
Alan Insole	Member	“

Anyone wishing to make nominations for officers, motions or other matters to be placed on the agenda of the Annual General Meeting should provide details to the Secretary by the **end of February**, in order to meet the constitution requirements. All nominations welcome, especially any for the position of Field Secretary.

Homo Britannicus – The Incredible Story of Human Life in Britain by Chris Stringer



Having a baby-sitter available, I grasped the opportunity to take my husband to an excellent lecture at Bath Geol Soc on November 3rd 2011 on Earliest Humans in Northern Europe by Professor Jim Rose, Editor-in-Chief, Proceedings of Geologists' Association, Emeritus Professor of Geography, Royal Holloway, University of London.

Summary: Eastern and midland England provide the earliest evidence for humans (hominids) in northern Europe. A recent body of evidence suggests that humans may have lived in Britain as early as around 1 million years ago, but certainly there is good evidence for humans in the British land area around 750,000 years ago. The lecture will outline the history of the research, the evidence for human occupancy, the nature of the environment and climate in which they lived, and the reasons why Britain (so far north) has provided this evidence.

Following this, my husband purchased this book as a surprise Christmas present for me.

Chris Stringer works at the Natural History Museum in London where he leads the Department of Palaeontology's research into human origins. He also currently directs the Ancient Human Occupation of Britain project, a collaboration of scientists and experts around the country, aimed at reconstructing the first detailed history of how and when Britain was occupied by early humans.

The book details the sequence of ice ages and interglacials and the corresponding evidence of human occupation. In the introduction it includes a concise history of the development of archaeology and geology, which I can highly recommend. The conclusion is a lesson on the vagaries of the climate and its effects on human habitation and the likely effects of climate change on the habitability of the planet.

Catastrophic Floods and The English Channel

by Ian Donaldson

You've heard of Mount St Helens in of Washington State. The volcanoes of the Cascade Mountains are not the only geological curiosity in this vast state. No doubt you've also heard of The Grand Coulee Dam. But what are coulees?



View of Coulee in Washington State, USA (I.D.)

They're big, long dry valleys, found in the north-west USA. The name comes from coulisse, French for a groove. Actually they're not all dry - some river basins are dotted with ponds and puddles, and occasional small streams, but nothing big enough to carve out these giant features. The biggest, the Grand Coulee, is seven hundred feet deep, five miles across and eighty miles long. It contains the Columbia River, which is actually quite big, but still a shadow of its former self. When they thought about damming it in 1933, it was the biggest dam ever contemplated.

These channels have a rectangular section, unlike the vee of a river valley, or U-shaped valleys formed by glacial erosion.

There are lots of these coulees in the NW USA in a desert wilderness called The Channeled Scablands - a National Natural Landmark Park. But what made them? Obviously they once contained enormous rivers. The soil is sandy - two hundred feet thick in places, and made of loess, the wind-borne dust which swirled in the cold dry deserts at the foot of the glaciers during the last ice age. It covers some of the greatest lava flows the world has known. And these channels cut deep into this basalt bedrock too.



View of Channeled Scablands, Washington State, USA (I.D.)

When the 4000 foot thick ice started to retreat from North America and Europe about 18000 years ago, it formed pro-glacial lakes, blocked by rubble and ice. In Scotland a similar blockage formed a lake in Glen Roy. There, three long horizontal lines on the hillsides puzzled Darwin, Buckland and Lyell for many years. Then the Swiss Louis Agassiz realized these Parallel Roads were ancient shorelines formed by a retreating glacial lake over several thousand years.

Glacial Lake Roy was tiny compared to those in North America, where of course everything is bigger. Lake Missoula was enormous - greater than today's Lake Erie and Lake Ontario combined - 7800 km² with an average depth of 600 m. It was formed by ice and debris blocking the Clark Fork River in Montana, and vastly swollen by melt water. When it suddenly broke its bank, the torrent formed the biggest waterfall the world has known, ten times the flow of all the world's rivers combined. The deluge scoured the countryside all the way to the Pacific coast. Imagine - a wall of water 400 feet high and travelling at more than 60 miles per hour! It emptied this giant lake in a fortnight. And it wasn't just one outpouring.

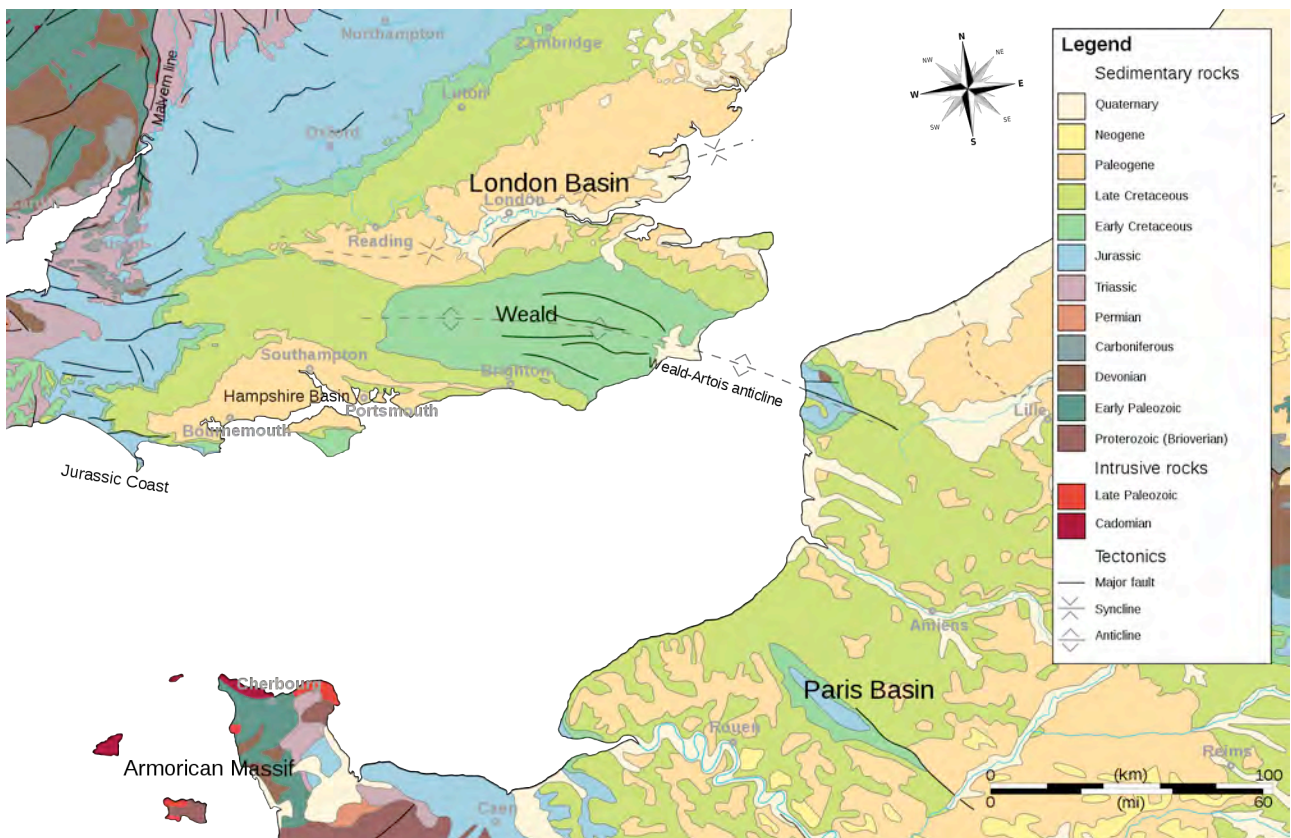


Dry Falls at Palouse, Washington State - all that remains of what was once the biggest waterfall the world has ever known - three times the size of Niagara (I.D.)

The first catastrophic flood was followed by many more over the next three thousand years. Then they dried up, but leaving lots of evidence for those with eyes to see. But it wasn't always thus. The biology teacher turned geologist who in 1920 first realized what had happened, J. Harlen Bretz was laughed at by the geological establishment for his fanciful ideas. But he couldn't explain a source for all this water. However in 1925, J.T. Pardee told him that the bursting of a giant lake could have formed them, and later, using just a tape measure and a theodolite, he recognised giant ripples, just like those on a sandy beach when the tide has gone out. But instead of a few inches between crests, what he saw on the Columbia Plateau were large parallel crests separated by hundreds of feet. Such ripples can only have been made by water flowing on a gigantic scale. Calculations showed that the flow was much greater than anything that exists on earth today. Their ideas gradually gained acceptance in the 1950s. Recent satellite mapping clearly shows these giant ripple marks, braided channels, long streamlined islands and other erosional features commonly seen in miniature on any tidal beach.

Closer to home, catastrophic megafloods were suggested as the cause of the ice-age breach of the narrow chalk ridge linking Britain to France by Alec Smith of Bedford College in 1985. His paper was forgotten as techniques then were inadequate to prove it. Then Sanjeev Gupta at Imperial College rediscovered it in 2006, and correlated the proposals with recent data from a detailed hydrographic bathymetric sonar survey, accurate to 10 cm of the Channel seabed. This has largely confirmed the hypothesis, with old braided channels and steep shorelines showing up clearly. These indicate at least two superfloods, one in the middle of the last Ice Age, the Pleistocene, in about 460,000 YA, and a newer one a quarter of a million years later. Both these occurred in warm interglacial periods. The silted-up channels were missed by earlier hydrographers, though Captain Thomas Hurd in the early 1800s identified the deep combined channel north-west of Alderney now known as Hurd’s Deep. At 172 m it is the deepest part of the English Channel and until 1974 was used as a dumping ground for date-expired explosives and radioactive waste. The survey also showed long thin streamlined underwater “islands” with flat tops - like mesas. Two of these off Dover had been charted earlier, but the others had been missed because the channels - perhaps they are coulees - have filled up with silt.

Before the ice-age breach, Britain had been linked to the Continent by a narrow isthmus of chalk, the Weald-Artois Anticline.



Geological map of SE England and the English Channel from http://en.wikipedia.org/wiki/File:Geologic_map_SE_England_%26_Channel_EN.svg; author (Woodloper)

With climate warming, the ice retreated a bit to the north, but still covering most of the North Sea. However, the Thames and the Rhine started to flow again and soon a massive lake had formed in the southern North Sea over Doggerland. When it was first breached, the pro-glacial

lake would have drained rapidly, perhaps in only a few weeks, sweeping all before it. And unlike Washington State's basalts, chalk is rather softer. The isolation of Britain is confirmed by archaeological records when the new sea prevented hunter-gatherers from following the herds of deer, a regular earlier occurrence. We think of the White Cliffs of Dover, but as David Bellamy shows, The White Cliffs of Sangatte are much more spectacular, giving some idea of how high the Weald-Artois Anticline had been.

Cataclysmic floods have also been proposed for the formation of The Mediterranean at the Straits of Gibraltar, and the flooding of the Black Sea basin. In fact, satellite imaging of areas previously glaciated world-wide show that they were responsible for much of the face of the Earth today. And of Mars, where the features are much more obvious.

Acknowledgements and References.

I first heard of these phenomena and the formation of The English Channel from Richard Wiatt, of the US Geological Survey in Vancouver, WA, to whom I offer many thanks. Fflyff McLaren kindly supplied the reference to Gupta's paper, in Nature Letters, Vol. 48, July 2007, "Catastrophic Flooding of Shelf Valley Systems in the English Channel", and there is a lot more on the Web. Alec Smith's "Late Quaternary Breach Formed the Hurd Deep" is in Marine Geology Vol. 64, p65-75, 1985. Shortage of water in the American West, and the Grand Coulee Dam is documented in Cadillac Desert by Marc Reisner (1986).