

The Science of the Earth

Javea U3A Lecture Programme and Further Reading

Lecture 1 February 13th Origin of the Earth and Its Structure

Origin of the Universe Big Bang. The Milky Way

Our Solar System, the Sun and the Planets

The Structure of the Earth and the Moon

Types of Rocks, Igneous, Sedimentary and Metamorphic

The Rock Cycle, Dating Rocks

Chemical Elements and Atomic structure, The Periodic Table

Further reading

Aubrey Manning (2006) Earth Story BBC 2xDVD's

1 Time Travellers 2 The Deep 3 Ring of Fire 4 Journey to the Centre of the Earth

5 The Roof of the World 6 The Big Freeze 7 The Living Earth 8 A World Apart

Iain Stewart (2008) The Power of the Planet BBC 2xDVD's

Volcano, Atmosphere, Ice, Oceans, Rare Earth.

I did not like this as much as Aubrey Manning.

Ron Redfern (2000) Origins Cassel & Co.

This is a coffee table type of book, brilliantly illustrated which covers the geological and biological topics well.

Lecture 2 February 20th Continental Drift

First proposed by Alfred Wegener 1913

Continental Drift The mechanism

Oceanic and Continental crust. Sea Floor Spreading

Tectonic Plates, Active and Passive Plate Margins

Mountain Building, Rifting

Faults Earthquakes Tsunamis

Evidence for Continental Drift

Geological time and Geological Periods

Precambium Rodinia

Paleozoic Pangea

Mesozoic, Cenozoic, (Tertiary & Quaternary)

Ice Ages, Glaciation

Further reading

Robert Kunzig (2000)

Mapping the Deep

Sort of Books

An account of our state of knowledge of the seas and ocean floor.

Lecture 3 March 13th Volcanoes

Structure, Causes of Eruptions

Appearance of Volcanoes

Type of Lava, Volcanic rocks, Plugs Dykes and Sills

Where do they occur

Submarine and sea mounts Surtsey.

Hot Spots

Effects of eruptions on the atmosphere

Calderas, Fumaroles and geysers

Activity and numbers,

Significant eruptions Toba ,Tambora, Krakatoa, Vesuvius, Stromboli, Etna, Santorini

Large Igneous provinces

Further Reading

Robert Harris (2004) Pompeii Arrow Book

A Roman Water Engineer is the hero, and he survives the eruption of 79 AD

Lecture 4 April 24th Evolution of life

Geological time

Hadean, Archean,

How life began. Photosynthesis and Respiration

Proterozoic, Ediacaran, Paleozoic Mesozoic, and Cenozoic periods

Extinctions

Evolution of plants and animals in the sea, on land and in the air

Fish, Amphibians, Reptiles, Birds and Mammals

Algae, Mosses, Ferns, Conifers, Angiosperms

Charles Darwin Origin of Species

Genetics and DNA

Genetic engineering

Civilisation

Further reading

Jared Diamond (2005) Guns Germs and Steel. Vintage

An interesting account of the development of civilisation in the “fertile crescent” which he contrasts with the civilisations in America.

Richard Dawkins (2008) The Genius of Charles Darwin Channel 4 DVD

OK but you get some of Dawkins anti-creationist dogma as well.

Richard Dawkins (2004) The Ancestor’s Tale Phoenix

Heavy going in places for the non-specialist but interesting .

Richard Fortey (2000) Trilobites ! Harper Collins

An interesting account of a group of paleozoic crustacean animals that play a major part in the fossil record of the period and in our knowledge of the position of the continents.

Lecture 5 May 15th Global Warming

What are the threatened events

What are the causes, the evidence, and what can we do? How have we done so far?

Ice core data.

UN IPCC

Reducing gas emissions, wind, tidal and nuclear power

UK and US power future

Recycling

Carbon sinks, Oceans, Forestry and Agriculture

Kyoto

Human population increase

Carbon trading

Further Reading

Christopher Booker Column Sunday Telegraph

A real sceptic on the warming issue, as well as the EU !

Martin Durkin (2004) Great Global Warming Swindle DVD WAGTV

Televised on Channel 4 as a counter to Al Gore and others.

Al Gore (2005) An Inconvenient Truth DVD

With the notorious J curve

Nigel Lawson (2007) An Appeal to Reason. A look at Global Warming.

I have not read this book but I understand that he says we should react to the effects when they occur rather than trying to prevent them

Bjorn Lomborg (2001) The Sceptical Environmentalist Cambridge University Press.

I really liked this book as it challenges the depressing mantra trotted out by almost everyone else.

Leonard DiCaprio The 11th Hour Warner Brothers DVD

Good Greenpeace stuff. There are too many of us and we are plundering the planet !

Internet Blogs

Sceptics

Anthony Watts What's up with that !

Steve McIntyre Climate Audit

Pro warmist Blog

Real Climate Michael Marin, James Hansen Gavin Schmidt