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Imagination and Science

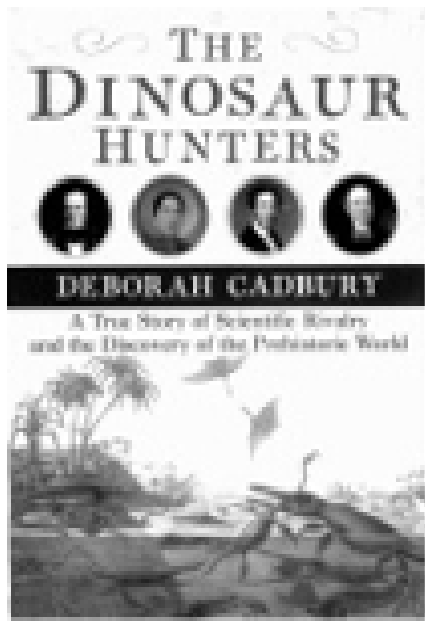
Jean Hardy

It's amazing to think that 200 years ago most people in England believed the earth to be about 6,000 years old, and the human race to have existed more or less from the beginning of time. Famously, Bishop Ussher in 1650 worked out from the Bible that God created the earth the night preceding Sunday October 23 4,004 years before the birth of Christ. No wonder then that most Christian people perceived God to be a human God, and the earth a residence designed for us – this picture was of course seemingly supported by the Genesis stories.

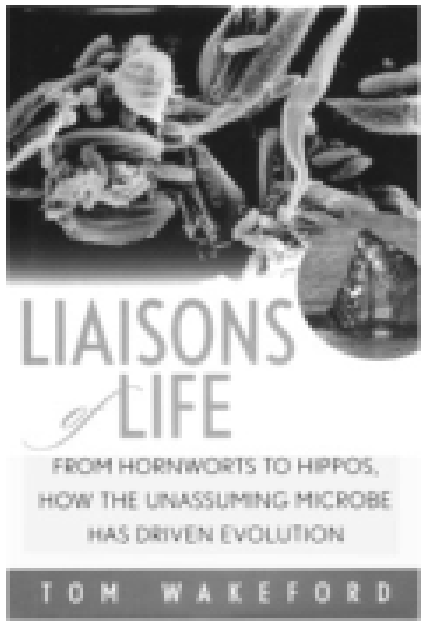
But what then were the enormous bones that people began finding at this time in the Lyme Regis area? A local family, the Annings, became particularly interested in finding and selling the 'fossil curios' scattered around in the area. Richard Anning and his daughter Mary set up a table offering for sale the 'verteberries' which looked like the teeth of crocodiles, the 'crocodilian snouts', and whirly shapes set in stone; and after Richard's death, Mary earned an income selling quite remarkable bones to tourists. In 1811 an enormous skull was found, which led to the discovery of an entire animal like a fish with a long tail. For this she earned £23, a substantial sum able to keep her family for 6 months.

These finds became famous, and Deborah Cadbury's book fascinatingly describes the detective searches of the first geologists – called by William Buckland, of Oxford University, 'undergroundologists'. Buckland's rival was a young man, Gideon Mantell, not an academic, and in spite of his devoted lifelong discoveries and imaginative speculations about the significance of these, never accepted by the university system. Mantell's findings were made first in the Lewes area where he particularly discovered ammonites and many other fossils. "For the young Mantell, science was 'like the fabled wand of the magician'

Review Article



Deborah Cadbury: The Dinosaur Hunters. Fourth Estate. 2000



Tom Wakeford: Liaisons of Life. Wiley & Sons. 2001

which could 'call forth from the stone and from the rock their hidden lore and reveal the secrets they have so long enshrined'. Mantell in his book *Thoughts on a Pebble* unconsciously echoes Blake in writing "there is no picking up a pebble by the brook side without finding all nature in connexion with it".

These hunters came to realise to their astonishment that the earth must be older than had been supposed: and they came to see that the climate that had supported these 'crocodiles' must have been far warmer than the nineteenth century weather: this was particularly obvious when they came to find the remains of tropical vegetation. They realised the earth was a vast tomb of earlier lives – something that probably most of us don't readily imagine even today. The findings were shared and greatly extended by the work of Professor Georges Cuvier, a distinguished Parisian geologist.

At first Mantell saw the animals he was discovering as giant lizards. It

was not until 1841 that Richard Owen called the reptiles *Dinosauria*. By then many academics and others were studying and naming the long dead remains of incredible animals and plants. Gideon Mantell and Mary Anning, who had done so much of the hard initial work, and continued to find and reflect on these animals, were cruelly omitted from the honours and acknowledgement given to university geologists.

The mid nineteenth century was of course full of controversy about the meaning of these findings. A clergyman wrote to Mantell: 'from our knowledge of the works of the Deity, it seems improbable that so stupendous a fabric as the Globe of our Earth is, could remain for any period of time solely occupied by a Race of Reptiles'. And of course the newspapers were full of cartoons of nineteenth century men with spades and scientific instruments examining these unlikely remnants found under the earth's surface. All this shocked specu-

lation was magnified enormously 20 years later when Darwin's even more controversial thesis *Origin of Species* was published in 1859.

How far has science changed our myths and views of the earth and the universe in the last 200 years? Has our collective imagination really caught up with these scientific changes?

And the second book listed above challenges our perceptions still further. Another great controversy that has continued in science, is whether Darwin's theories of evolution actually tell us that the nature of the universe is essentially and mainly one of struggle – or not. Darwin himself was most exercised by the implications of what he was writing, and knew of course that there is cooperation both within species and between species: and also that all beings are whole worlds of species within themselves, as complex as the outer universe. The more popular warlike version of Darwin's work was challenged by Schwendener in 1869 and in the early twentieth century by Kropotkin's *Mutual Aid* which argued that the natural world is as full of cooperation as it is of competition, among many other researchers before and since. However, the Huxley version of the

story of evolution, "the survival of the fittest", is still the most famous of the stories we tell ourselves about the human and universal condition.

Tom Wakeford's recent book is about this most powerful set of myths. Like Deborah Cadbury's study, its 'just scientific' theories have great implications for our religious, spiritual, political, social, ecological and imaginative beliefs, and indeed our present picture of 'reality'.

Michael Colebrook told the story about Beatrix Potter in the Summer 2002 edition of the Journal from Wakeford's book. She too tried to challenge the accepted version of conflict as the basis for all life, and was rejected by the scientific establishment in the 1890s.

For me, as a non-scientist, many of the other stories about symbiosis and cooperation between species in his book are equally thought-provoking and unexpected or unlikely. Tom Wakeford describes, for instance, how Pasteur's work served to demonise bacteria, seeing them as on the whole 'bad', and calling them 'germs', which need to be destroyed. However modern biologists now perceive that bacteria, which exist every-



Mary Anning

where in the world, are essentially performing many functions: "the vast majority of bacteria live harmlessly and unobtrusively on the surface of our [our?] seas and in our gardens, quietly undertaking biological processes crucial to every ecosystem". They lived as a species billions of years before us, and presumably will exist long after the disappearance of the human race.

Wakeford also tantalisingly describes how, before the Cambrian explosion 550 million years ago when animals with skeletons first appeared, a group of creatures called (by us) the Ediacarans appeared, "a host of ... extraordinarily shaped, soft-bodied, multicoloured creatures" which had no predators and did not feed on other species, and which existed for "only" 50 million years in a kind of peaceful paradise.

Of more immediate interest, I knew nothing about the underground web of plants which exists, say, in woods and which can share food between all its members. I'm interested in this because I have recently helped create a tiny forest garden, and have visited a beautiful one of 2 acres on the Dartington estate. Within a community of plants, a mycorrhizal network can flourish, deep underground. This is a fungal web which links all the plants, so that nutrients can be passed



Cartoon inspired by William Buckland's lectures



Richard Owen riding a *Megatherium*

member of its community. Loneliness is not a word in the fungal vocabulary'. The nourishing systems of living plants forming an invisible community flourishes underground, invisible to our eyes, as well as all the evidence of billions of years of past life always beneath our feet.

What difference does this scientific knowledge in geology and biology make to the human imagination?

The hope of early scientists was that the more knowledge we acquired, the more we would be able to control the conditions of our lives. Many modern scientists seem to see the world as highly imperfect, always trying to put it right – so we shouldn't become diseased, we shouldn't die, we should be able to alter everything we think is wrong. But we are beginning at times to acknowledge that whatever spirit created this world has a far greater intelligence than us. As soon as we 'put something right', like offering immunisation ad lib or changing genetics in plants and animals, the sooner do unexpected 'side-effects' show – bacteria develop more resis-

tance, genetic makeups carry more surprises than we can imagine. And children need to experience dirt more than sterility and excessive cleanliness: 'a sterile world is a dangerous one'. And the hope that we will be able to understand everything has been turned on its head.

The more we know, the more we realise how unexpected, amazing and many layered the world is, far beyond our ken.

Greenspirit is based on ecology and spirituality. It looks to science and its implications, and to the human imagination. Books such as these challenge all of us in our understanding of the universe as being truly interconnected, diverse, with a capacity for justice and beauty, sacred and mysterious. The more we learn the more awesome it all seems to be. Couldn't we have a great conference on this theme?

Jean Hardy

from a very flourishing plant to another which is short of a particular nutrient, say phosphorus: in fact many nutrients can be shared, a kind of vegetable welfare state. Like the worst Internet addict, almost every fungus is permanently online with another

Our Rolling Programme

Chris Clarke

Thomas Berry has reminded us of the Great Work, the Work in which the cosmos was continually being created in new unfolding of beauty. Our work in GreenSpirit is that of joyful and loving participation in the Great Work, but what does this mean in practice? As an organisation we have for many years been stressing that this involves two parts, internal and external. The 'internal' part is that of nurturing ourselves. We do this as a collection of individuals engaged in our own various 'works', alone and as members of many other organisation; as a network of local groups each responding to their local needs; and as a community that comes together for events such as our annual gathering. The 'external' part is our outreach – through the journal GreenSpirit, through occasional pamphlets and the GreenSpirit website, and through meetings aimed at a wider public. In our early days these public meetings were our dominant activity, with frequent visits by Matthew Fox a salient part. Now we see this activity once again starting to gain momentum, and we are seeing the outline of a rolling programme of meetings, each building on the last, in which we hope that increasingly many people and local groups will be participating.

This revival started with the Hengrave symposium held earlier in March this year. The overall feedback we received from that event was immensely encouraging, with almost all of you expressing appreciation for what we jointly created there, particularly the meeting of like minds and kindred spirits, with much mutual feeding, freeing and healing. This emphasised that the two parts of nurturing and outreach were not separate, but that sharing in community was an essential part of all our meetings. Most wanted some form of follow-on, while some regretted the inaccessibility of Hengrave Hall, and some were looking for more local events.

We are currently thinking of a programme of two major meetings a year, an annual gathering in autumn that is more 'internal', and a larger meeting in spring that is more 'external'. We hope that other more locally based activities might grow around this. The pattern for the next 2 years (please note in your diaries now!) is as follows.

Meeting with Brian Swimme as main speaker. 24 May 2003, afternoon, at the Friends Meeting House near Euston Station, London (these details are provisional and will be confirmed). This is likely to be linked with the Schumacher Society's lecture programme and may include another speaker in dialogue with Brian – more details later.

GreenSpirit Annual Gathering. 7 – 9 November 2003. at Hengrave Hall.

Major Residential meeting with David Abram on 2 - 4 April 2004, at the University of Leicester, which has good access both from London and the North, provisionally entitled 'Life in all its fullness.'

We see the ideas and inspirations from these meetings following on from one to the next, forming 'threads' that can build up our vision and strengthen our participation in the Great Work. Look out for further details of these, and other intermediate meetings, in the next issues of GreenSpirit.