

Science & Environment

We must find a way to reconnect people to science

ACCORDING to a poll published in November, 80 per cent of Britons were unaware that 2009 marked the 200th anniversary of Charles Darwin's birth, and 150 years since first publication of his *Origin of Species*.

Let's hope the barrage of newspaper articles, TV programmes and events over the last few weeks has improved matters. In Scotland, universities, science festivals and literary festivals, are showcasing Darwin 200 (www.darwin200.org) right through the year. It's as impressive as the recent 250th anniversary of the Bard.

That is a useful comparison: we don't tend to celebrate our scientists. I don't know of special days for Newton, Harvey, Faraday or Pasteur, whereas Darwin's birthday is celebrated worldwide every year. So why is Darwin special?

It is partly because Darwin provided a novel and revolutionary explanation for the origins of the array of living organisms we see around us. In particular, he claimed (and recent work has confirmed) human beings are derived from and closely related to other animals.

This scandalised those who saw man as special, the pinnacle of creation, in the same way as Galileo and Copernicus scandalised earlier generations by showing that our Earth is not the centre of the universe.

However, biologists also celebrate Darwin to emphasise the continuing importance of his work in the face of the curious status of the theory of evolution among the general public. In general, non-scientists feel they understand too little of science to be able to challenge what scientists say. But in the case of evolution, many people feel able to deny it, despite the evidence.

A 2006 survey of 34 countries (31 European nations, the United States, Japan and Turkey) showed that evolution denial is low in Europe and Japan (mostly less than 20 per cent) but high in the US (about 40 per cent) and Turkey (50 per cent) – the only Muslim country in the survey.

Last week, however, a new survey suggested matters are much worse in the UK. The results of a ComRes poll for the think tank Theos's "Rescuing Darwin" project were reported with headlines such as "only 25 per cent of Britons believe Darwin's theory of evolution".

The trouble with surveys is you need to look carefully at the questions and the sampling techniques used. ComRes has not yet published details of its methodology but, if the results



Roger Downie

truly reflect the views of the UK public, they are alarming.

For example, having defined Young Earth Creationism as the "idea that God created the world sometime in the last 10,000 years", the pollsters found that 33 per cent of a sample of 2,060 from all over the UK regarded the theory as definitely or probably true. This result flies in the face, not only of the theory of evolution, but also of much else in modern science.

However, another of Theos's questions is more revealing of the nature of their project. It reads: "Atheistic evolution is the idea that evolution makes belief in God unnecessary and absurd; in your opinion, is atheistic evolution..."

"Darwin provided a revolutionary explanation for the origins of the organisms we see"

For the record, 57 per cent found the statement probably or definitely untrue. But there is no scientific theory of "atheistic evolution".

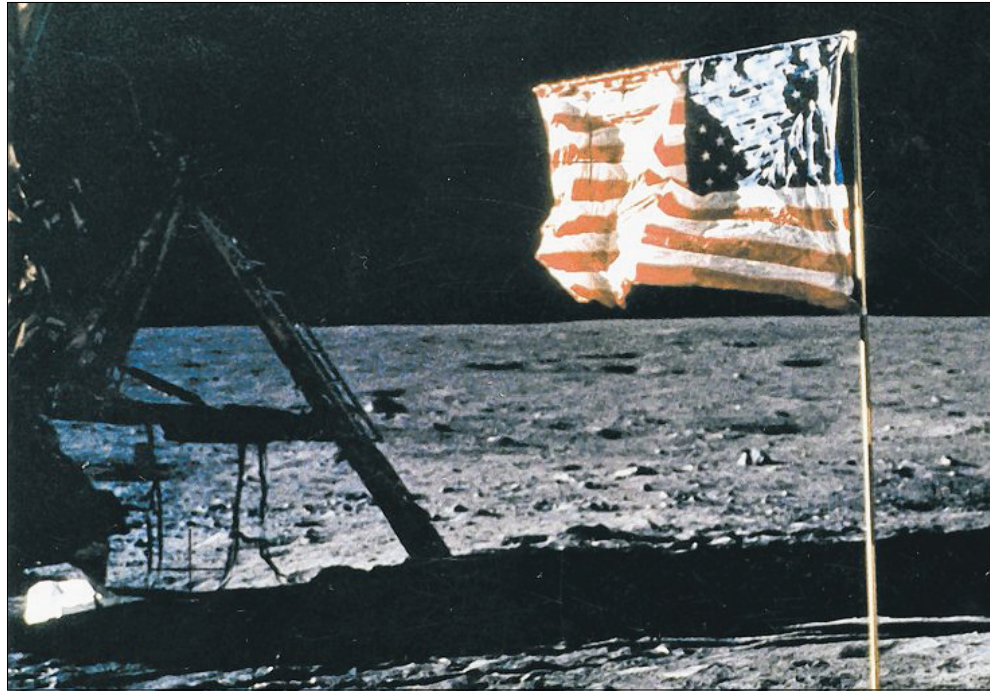
Darwin's theory of evolution is not a test of the existence of God (or gods). Rather, it shows there is no need to propose a supernatural explanation for the diversity of living organisms, since natural explanations are to hand. This conclusion has been accepted by most mainstream religions, the exceptions being those that regard the diverse accounts of the creation of the world in their founding texts as factually true.

But we need to ask: is evolution a special case? It is well known that general knowledge and understanding of science is poor, despite the science taught in schools and the efforts put into public understanding by museums, festivals, books and the media. The levels of evolution-denial are complicated by the evolution-religion debate, but are not that different from ignorance of other science.

We aspire to be a knowledge-based society, but a recent survey showed few school children foresaw a career in science.

We must find better ways to excite and interest young people in science as a way of solving the world's problems.

● Roger Downie is professor of zoological education at Glasgow University.



President John F Kennedy said in 1961 that the United States would reach the moon by 1969. That same level of determination to deal

The final frontier in tackling climate change

Meteorologist Sir John Houghton tells Craig Brown why the space race provides a lesson on global warming

WE LIVE in what could euphemistically be described as "interesting times". With every passing week the global economy bears an ever greater resemblance to the Leaning Tower of Pisa, while around the world, local conflicts threaten to spread and consume areas faster than the wildfires that have recently ravaged parts of Australia.

With such pressing concerns, it is not difficult to appreciate why climate change, for politicians and the public, is in danger of becoming last year's issue.

Of course, those fighting for a sea change in the amount of CO₂ countries produce and the sources from which they get their energy would consider such short-termism untenable.

Climate scientist Sir John Houghton is one such person. As a former chairman of the Scientific Assessment Working Group for the Intergovernmental Panel on Climate Change (IPCC) for 14 years, and a former director of the Meteorological Office, he is a staunch believer in the disaster that

awaits the world if it fails to tackle climate change.

Not given to understating the urgency of the issue, he has described global warming as a "weapon of mass destruction". Thus, it should come as a surprise that he will give the latest of the James Gregory public lecture series at St Andrews University this week, raising the question: "Global warming – is it real and what should we do?"

It would be wrong to believe Sir John considers climate change anything other than a reality. He took time to investigate the claims of the fossil fuel industries, and once stated in a report: "We do try, in the IPCC, to look very hard at alternative explanations, and spend, actually, probably more time than we should on some of them, because they get so much publicity."

But in the here and now, it is the "what should we do?" that concerns Sir John the most. He says: "We've got to get on with it, because it is very urgent. The sooner we do it, the less damage will be caused in the medium term. So we really have no option if we're being responsible."

And while not dismissive of the dif-

icult economic situation, he is emphatic that if politicians push climate change off the agenda and shelve plans to invest in sustainable and clean forms of energy, they will be making a fundamental social and moral error.

"We have to spend now, up front, to save later," he insists. "Because if we don't, it's going to cost us a lot more further down the line. I'm sure their day-to-day work is so focused on the economy that they don't think about it too much, but they should. That's what politicians are for."

"I pay my taxes so they will look after not just me, but my children and grandchildren. I know they will be out of power long before they see what they have to do come to fruition, but they're there to look at the long term because industry won't put the investment in for the long term – it can't, it doesn't have the money."

Indeed, even though he describes the situation as on "red alert", Sir John is keen to emphasise the opportunities for British commerce if it has the confidence and ambition to invest in new energy technologies. He says: "President John F Kennedy said in 1961 America was going to the moon by 1969, and they did."

"It cost them a trillion dollars in those days, but they've made that money back time and time again, because it was something to do, it was difficult to do, it developed lots of new technology, lots of new systems, and the American economy benefited enormously from that project. They didn't lose money on that project, in fact they made a lot."

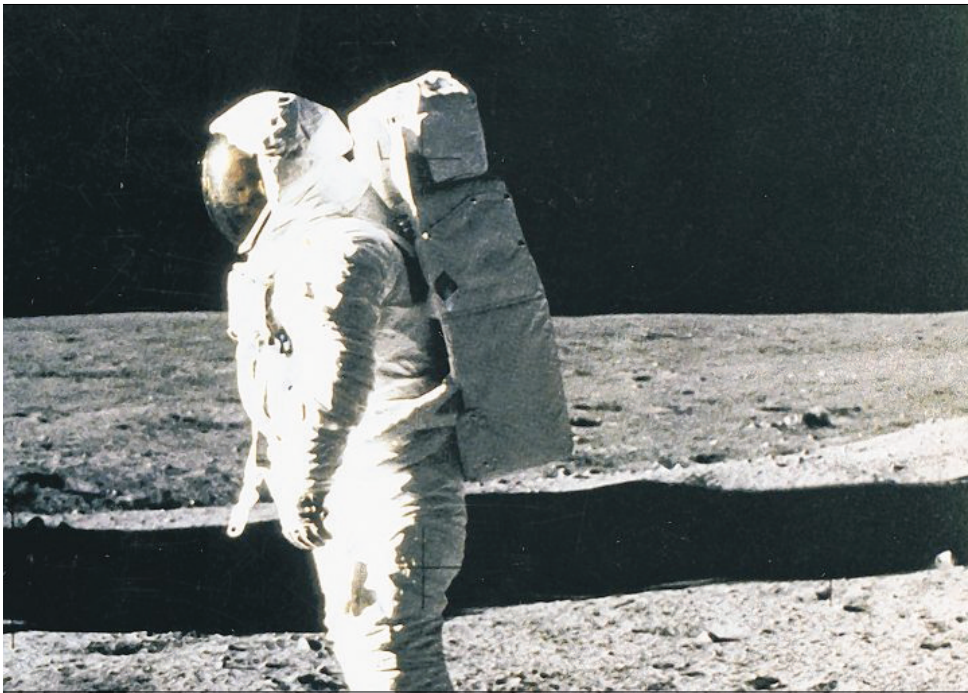
He adds: "We need ambition to do this; we need confidence and determination to

Sir John Houghton: 'We've got to get on with it, because it is very urgent. We really have no other option'



MONDAY

Law & Legal Affairs: An exclusive interview with Paddy Ashdown



with global warming is vital if the world is not to face an environmental catastrophe, says Sir John Houghton

Picture: Nasa

make the long-term investment, realising that by doing it we're not only solving the climate change problem, we're doing lots of good things on the side.

"The latest International Energy Agency report on the subject looked into the investment costs needed to reduce emissions, and found the saving we will make on fuel will provide the investment funds necessary. It's a virtuous circle."

But even now, Sir John admits that even though the technology exists, it is not being used willingly. "Carbon capture and storage are absolutely essential," he says.

"We should be doing it right away to set an example to the rest of the world, in particular India and China, because they need that technology put in all their power stations and quite a lot of R&D needs to be done before that can happen.

"We're talking about building new coal-fired power stations, we should not build any new ones that do not have carbon capture technology in them. We're saying 'oh we'll build them and put the CCS in later on. Well, that's absolutely not strong enough."

This issue of co-ordinated strategies and the involvement of developing economies is key to Sir John's thinking in tackling global warming. The western nations, which

have had more than 200 years to build their industrial base, using cheap, polluting energy and are now demanding that others "do as we say, and not as we do", have attracted accusations of hypocrisy from the developing world. Sir John insists there is a moral imperative for us to help them make the shift.

"We've got to recognise that they haven't had the opportunities we've had of growing wealthy on cheap energy from fossil fuels and we've got to help them with our skills – but not in a patronising way – and our wealth to help them get out of poverty and achieve sustainability," he says. "That's a very important attitude for us to take; for us to say 'we won't start doing anything until you start cutting your emissions' is a moral low ground if ever there was a moral low ground."

It is in the United States that Sir John finds hope for the future. For years, the Republican government refused to acknowledge global warming as a reality, but with the election of president Barack Obama, one of the world's biggest polluters has finally acknowledged the need to come clean.

"Obama's very interesting and I hope he can do what he wants to do; it's a big chal-

lenge for him and the US," Sir John says. "We have to support him all we can."

But Sir John also believes if the UK does not invest in clean energy technology, the US could leave the country standing.

"If we don't [invest], the US will just bypass anything we are doing, it'll go so fast," he says. "American industry will pick this up in a way that we have not."

"We have industries that are capable of this, but they don't see the government setting the frameworks up that will enable them to make money out of them.

"Government needs to set a long-term framework in terms of economic measures and incentives – to give the assurance that they will support them in all the things that are necessary. That isn't happening."

But while it sounds like a hard slog ahead for all concerned, Sir John insists the revolution he is calling for will be worth it.

"We're facing a great opportunity, and there's a lot of fun to be had," he says.

"It will be very good for us, because we now have the chance to change the way we get our energy. There will be an enormous revolution in the energy basis and a revolution in our engineering, all of which will benefit us in so many ways. The possibilities are endless."

The glittering career of a pioneering climatologist

A WELSHMAN, Sir John Houghton is a former professor of atmospheric physics at Oxford University and regarded as one of the world's foremost climatologists.

During his career, he has held many distinguished scientific offices, including the director-general of the Meteorological Office and chair of the Royal Commission on Environmental Pollution.

He also founded the Met

Office's Hadley Centre, which examines the science of climate change, and he currently leads the John Ray Initiative educational charity as well as serving as a trustee of the Shell Foundation.

In 1988 he was appointed the co-chair of the United Nations' Intergovernmental Panel on Climate Change's scientific assessment committee, a role he fulfilled for 14 years, producing three IPCC reports.

Knighted in 1991 for

services to science, he has written numerous articles and books on climate change and received a host of scientific awards, including the Royal Astronomical Society Gold Medal, and the International Meteorological Organisation Prize.

During the 1970s, Sir John worked for Nasa, acting as principal investigator for space experiments on the agency's spacecraft.

Despite his scientific background, he is a devout

evangelical Christian who has spent much of his career reconciling his faith with his scientific work.

He believes that proof is necessary to back up beliefs and rejects Creationism, famously describing it in 1997 as "a pain in the neck".

His Christian faith has informed much of his scientific debate and he is the author of scientific, theological books *Does God Play Dice?* and *The Search for God: Can Science Help?*

Reviews

MUSIC

THE VIEW
PICTURE HOUSE, EDINBURGH
★★★★★

IT'S hard to imagine there ever having been a thinner culture divide between the band on stage and the audience in the pit than here. Maybe at an Oasis show way back in the day, but that feeling soon passed as the Gallaghers began to slip into their at least partly media-defined personas.

There was no sense of such refinement taking place with Dundonian quartet the View, which suggests two things. One, that they come fairly close to the true spirit of rock 'n' roll, whatever that is, by refusing to be moulded into any shape that's not their natural one. And two, they probably won't evolve much beyond the band of rough troubadours who used to play for their mates in the Dundee Doghouse all those years ago.

So you take the rough with the smooth, and on their own terms the View are outrageously good fun. Some of

the best bits, in fact, came not when they were actually playing, but when they were noising up the crowd like two old mates getting confrontational across the bar. Fingers were pointed at pint-throwers, and a warning was shot at someone who shouted in the direction of a bunch of girlfriends off to the side of the stage: "you ugly bitches have got no chance – you can look but you can't touch!"

The dedications also came in earnest: *Temptation Dice* for producer Owen Morris, *One Off Pretender* for "the boys in blue" (not in a complimentary way) and *Superstar Tradesman*, inexplicably, for "the joiner that fitted the wall in the backstage bit".

Aside from a three-song acoustic interlude that emphasised the rarely-discussed folk twang in their music and Kyle Falconer's voice, these songs were rowdy, breathless, soaked in sweat and spilled pints. A few – *Wasted Little Djs*, *Same Jeans, Comin' Down* – stood out, but the crowd cheered in groggy ecstasy for every opening note.

DAVID POLLOCK

MUSIC

ST DELUXE
CAPTAINS REST, GLASGOW
★★★★★

GIVEN his penchant for raving hyperbole, Alan McGee – he of Oasis discovering fame – is a man whose words always have to be taken with a pinch of salt.

Yet by championing Glasvegas long before the mainstream took any notice of them, the ex-Creation Records boss has proven himself to still have a decent eye for a new prospect.

McGee has described the Glasgow four-piece St Deluxe as a "Scottish Nirvana for the 21st century". They're not, but you can see roughly what the man's thrusting at.

Wearing a bunch of noisy-yet-tuneful late 80s-early 90s influences on their sleeves – Dinosaur Jr, Pavement and early Teenage Fanclub among them –

St Deluxe skim their style from much the same gene pool as did Cobain and co, who always claimed to be a melodic pop band at heart in spite of their music's discordant facade.

Launching their self-titled debut album here – which is released on PoppyDisc, the label run by McGee's Creation co-founder Joe Foster – St Deluxe channelled their heroes righteously, imbuing *Slip Away* and *Can't Change* with earnest lyrical hooks and riffs and solos fuzziier than a boiled sweetie found down the back of an old sofa.

They only really started to cut loose towards the end, as singer Jamie Cameron screamed his way manically through *Stupid Ideas* from under a mop of suitably long and lank hair. It was an outburst at odds with his otherwise shy demeanour, but who needs front when you've got the king of the big talkers babbling your praises?

MALCOLM JACK

THEATRE

DO I MEAN ANYTHING TO YOU OR AM I JUST PASSING BY?
TRON, GLASGOW
★★★★★

IT WAS tantalising stuff, this 40-minute show by Glasgow company 12 Stars.

First seen at the Traverse in 2006, and deeply inspired and shaped by the work of the Glasgow band the Pastels, this show involves four short monologues, tales of the city set in a faceless 21st century urban landscape.

Most of the stories seem like long-lens cinema shots, featuring a man talking to himself in a pub car-park, or a woman with financial difficulties wandering an urban forest in search of other levels of existence; and they are intercut with sequences of specially recorded music, brooding or ecstatic, to which the three

actors move and dance like robot-mimes on a city street, or a like a rock group rehearsing moves for a celebratory concert.

The show touches, in other words, on a series of key themes in contemporary culture, from urban rootlessness and alienation, to the increasingly intimate relationship between the music that forms the soundtrack of people's lives, and the way they actually experience those lives; and Gerard McInulty's short text, like his production, is full of intensity and atmosphere.

But the show engages so lightly and briefly with its material that it still seems more like a sketch for a possible performance than the performance itself; and two years on, it's hard not to feel that this show should be delivering more substance if it wants to mean something to us, and not simply pass by.

JOYCE MCMILLAN