Q&A

Jon Gluyas of Durham University, UK, is the country's first professor of carbon capture and storage and geoenergy.

Did your scientific inclinations emerge at a young age?
Definitely. Aged four, I asked my mum why the Moon changed its shape. I shouldn't malign my mother, but I knew her answer — because a cloud was in front of it — was fundamentally wrong. Even then it was evident that I was driven to understand how things work.

You were in the oil industry a long time, did you join it straight after your PhD?
Yes. My PhD research looked at lithification — how soft sediment becomes hard rock — with particular emphasis on near-surface processes mediated by bacteria. As these processes often occur as organic-rich rocks containing oil evolve, I was attracted to jobs in the oil industry.

How did you become the first professor of carbon capture and storage?
I'm not the first person to do this type of work, just the first to be given this title. I helped design the position as a result of my long-standing relationship with Durham University, but I never expected the university to ask me to apply for the position. I've managed to publish quite a bit while in industry, I have a good network of collaborators, and I launched two UK-based oil and gas companies. I make things happen and the university is looking for me to do the same in academia.

What has been your greatest contribution to science so far?
I did a lot of research in industry aimed at using the properties of rock to predict the ease or difficulty of oil extraction. That work led to a then-heretical discovery that lithification could occur more quickly over geological time than previously thought. Before our work, lithification was presumed to take hundreds of millions of years. We discovered that presumption is inflated by up to two orders of magnitude. Our early publications in the 1990s on this process, which we dubbed 'event cementation', were initially controversial. Now it's the accepted norm.

What convinced you to pursue carbon storage?
Until two years ago, I focused on helping run a company, Acorn Oil & Gas in Middlesex, dedicated to making the best use of non-renewable resources, in part by using new technology to extract the remaining oil at old fields. In recent years, I began collaborating with Durham University's Centre for Research into Earth Energy Systems and became more familiar with climate-change research. Growing evidence of past carbon dioxide levels convinced me that adding CO_2 to the atmosphere is leading to a rate of warming that is unprecedented on any known geological timescale. As a species, we are exploiting the planet like never before. We have men to collect the rubbish bins. Perhaps we should begin to do that with other products, such as CO_2.

What is the biggest misconception about carbon capture and storage?
That it is dangerous. Carbon dioxide, of all the things society chooses to store underground, is safer than most because it doesn't explode.

Can carbon dioxide be stored indefinitely?
Indefinitely is an ill-defined term. On a human timescale, we think about hundreds to thousands of years. Take methane. It is mobile in Earth's surface for up to hundreds of millions of years. I see no reason why we shouldn't be able to capture CO_2 for similar lengths of time. We simply have to choose good storage sites, such as those that are tectonically benign. We wouldn't store it along the San Andreas fault, for example. We are about to start working on how to solidify CO_2 into calcium carbonate through reactions with slag from smelting operations, for instance.

How should carbon capture and storage be launched?
The United Kingdom is talking a good talk at the moment, but converting that into action is where I can help. My belief — which may be heresy to carbon-capture purists who don't want to tie carbon capture to oil extraction — is that a cost-effective way to develop carbon-capture and storage projects is to couple them to oil-recovery efforts at abandoned sites. We can offset the huge capital expenditure of drilling the holes needed to create a storage site by going back into old oil and gas fields with an existing infrastructure to extract the remaining oil.

Can society rein in the effects of climate change without carbon capture and storage?
It seems to me that carbon capture and storage is the most important thing society can do on a large scale at point locations such as power stations. Are we too late, having pumped 150 parts per million of CO_2 into the atmosphere? Maybe to prevent the predicted two-degree warming, but why do nothing to curtail greater warming? The consequences of failure are scary. ■

Interview by Virginia Gewin

IN BRIEF

Charles River downsizes

Charles River Laboratories is suspending operations at its preclinical services facility in Shrewsbury, Massachusetts, and laying off 300 researchers, technicians and administrative staff. "This decision comes after a challenging year in which the consolidation of the biopharmaceutical industry, the slowdown in research and development efforts, and financial constraints for biotechnology companies resulted in softness in market demand for our services," says chief executive James Foster. The firm hopes to reopen the facility when the market improves, he adds. The decision will not affect the firm's animal-supply division.

Small rise for US postdocs

US postdocs funded by the National Institutes of Health will receive a 1% increase in stipends this year, to give a first-year allowance of US$37,740. The rise comes after two years of no change and in the wake of advocacy efforts from the US National Postdoctoral Association (NPA). A federal bill that would have boosted the stipend by 2% did not make it through the US Senate last month. NPA executive director Cathee Johnson Phillips says that the association will advocate for a larger rise for fiscal year 2011. "We're still well below the $45,000 target established in 2000," Johnson Phillips says, referring to a recommendation by the National Academy of Sciences for how large stipends should be for first-year postdocs (see *Nature* 453, 129; 2008).

Biotech ends on a high

The US biotechnology industry raised 85% more money in 2009 than it did in 2008, according to figures released by venture-capital firm Burrill & Company in San Francisco, California. US biotechs raised $55.9 billion in 2009 through public and private financing and partnerships. The firm reports that private venture-capital financing for US biotechs in 2009 came to $4.07 billion, down by 2.6% from 2008. But partnerships, in which pharmaceutical companies pay biotechs to develop a product, jumped by 84% to almost $37 billion. Chief executive Steven Burrill says that companies that use a variety of ways to raise capital are the ones likely to be the most successful.