

A post-carbon geography

David Hicks challenges schools, and geography teachers in particular, to build the foundations and develop a geography curriculum which prepares students for a post-carbon future.



Accompanying online materials

Nothing less than a major reorientation of geography as taught and learned in schools is required if students are to gain a realistic understanding of contemporary environmental challenges. The commonly taught subjects in the geography curriculum are capable of being taught in order to accommodate the challenges of the post-carbon era. (Matthewman and Morgan, 2013).

Where are we going?

Nearly thirty years ago Rex Walford (1984, p. 207) argued that if the future is unavoidable we should at least not walk backwards into it. Some twenty years later the emergence of such an interest in geography and futures was noted (Hicks, 2007) and most recently explored in this year's Geographical Association Annual Conference. But what the future might require of geography educators changes over time, so that both research and teaching need updating and refocusing.

What one should immediately note in this context is that curriculum subjects do not exist in a vacuum. In the broadest terms I believe the purpose of geography is to help young people make sense of their world and to prepare them for a future which will be very different from today. The future we are faced with now will not be one of inevitable 'progress' and growth. It cannot be 'Business as Usual' in the face of growing climate change, an impending energy crisis and

the need to move to a post-carbon future. So do current geography teaching and research critically challenge or unthinkingly support a high carbon view of the future?

This raises questions about who should control curriculum subjects: the teaching profession or politicians? Where once changes in geography teaching occurred as a result of professional deliberation they are now influenced by political ideology, which alters as governments come and go. The current emphasis on geographical 'knowledge', whilst important, is often matched by a devaluing of issue-based work. This is central to a conservative view of education: hence the 'disappearance' of climate change and sustainability from draft proposals for key stages 1–3. A neoliberal free-market view of the world, by definition, puts economic growth before human and environmental well-being (Gray, 2009).

Revising the climate

We do need to rethink profoundly what we teach about weather and climate. Yes, students need to understand the underlying processes but over the last decade our awareness of climate change has dramatically shifted. Headlines such as the following are now commonplace: 'Floods are now UK's top weather threat'; 'Large CO₂ rise sounds climate change alarm'; 'Why our turbulent weather is harder to predict' and 'Millions face starvation as world warms'. It is important therefore to be clear about what is definitely

Figure 1: Drax Power Station is a large coal fired power station in North Yorkshire. Because of its large size it is the UK's single largest emitter of carbon dioxide. To reduce these emissions it is currently converting three of its six generating units to burn sustainable biomass. This however is controversial as it will mean millions of tonnes of North American wood pellets being shipped to the UK.

Photo: Bryan Ledgard.



known about climate change. A special report in the *New Scientist* (Le Page, 2011) distinguishes clearly between what we know and what we do not. Thus we know that:

- greenhouse gases are warming the planet;
- the planet is going to get a lot hotter;
- sea levels are going to rise many metres;
- there will be more floods and droughts.

What still needs to be clarified is:

- how far greenhouse gas levels will rise;
- exactly how much hotter things will get;
- how the climate will change in specific regions;
- how quickly sea level will rise;
- how serious a threat global warming is to life;
- if and when tipping points will be reached.

What most climate scientists accept is that such changes are anthropogenic, that is they are the result of human activity over the last 200 years, in particular the burning of fossil fuels during the last century (Figure 1). This is an uncomfortable truth, because it means that many of the fruits of 'progress' arising from the scientific and industrial revolutions were a very mixed blessing. The great successes of the twentieth century, as well as leading to higher standards of living for some, have also led to the extremes of weather that are now reported daily from around the world.

But not everyone believes this to be true: shouldn't we also be listening to what climate change sceptics have to say? Well, yes and no. Oreskes and Conway, in *Merchants of Doubt* (2010) investigate in depth the nature and origins of such scepticism and denial. What they found was that it has a long history going

back several decades, beginning with acid rain, the ozone hole, the dangers of smoking and, most recently, global warming. Whilst claiming to be part of the 'scientific debate' on climate change these attacks are in fact no such thing, but are instigated by a small, mostly US, group which has long opposed any scientific research that they believe threatens free market principles. Latterly funded by fossil fuel corporations there is in fact no 'debate' at all but rather constant attacks attempting to discredit leading climate scientists.

What geographers now need to focus on is mitigation and adaptation, i.e. what needs to be done in our schools and communities to mitigate the effects of climate change, and what different sectors of society need to do in order to adapt to the changes that are beginning to occur. One of the best examples of schools being involved in mitigation are the Ashden Awards, given to renewable energy initiatives around the world. The school case studies are inspiring, as also is their Low Energy Sustainable Schools programme (Figure 2 and 3). One teacher comments, 'Working with Ashden over the last year has really driven our school forward – making our practices more sustainable and educating the next generation in the importance of energy reduction and our responsibilities as consumers of energy' (Ashden Awards, 2013). Adaptation is an equally exciting topic for students because this involves investigating how every aspect of our lives, from schools and homes to agriculture and transport, will need to change in the face of increasingly extreme weather events. Adaptation involves students in planning for things that will directly affect their own future.



Figure 2: Priory School in Lewes, East Sussex has solar PV panels installed by the community energy company Ouse Valley Energy Services Co. (Ovesco). During term time the school is expected to use most of the energy generated by the system but during school holidays the surplus will be sold back to the National Grid. While the school will save an estimated £3,000 on energy bills, investors in the project will be provided with a return of 4% per annum over the next 25 years. Ovesco won an Ashden Award in 2013 (see www.ashden.org/uk_awards).

Photo: Ovesco.



Figure 3: The data panel in the Eco Centre in Cockermouth School, West Cumbria. In 2007, Cockermouth School opened up a unique state-of-the-art Eco Centre, designed for use by students, staff and the wider community. It is engaging over 1,400 students and 200 staff in the energy saving challenge and starting to invest in energy-saving measures and renewable energy.
Photo: Ashden Awards.

Energy matters

The fruits of contemporary civilisation depend upon an abundance of coal, oil and gas. These, and the by-products of their extraction, from chemicals and plastics to fertilisers and pesticides, have given us our ultra-mobile world. But fossil fuels now need to stay in the ground unless we want current extreme weather conditions around the world to become even more severe (Berners-Lee and Clark, 2013). What helped create the rich world's wealth now comes directly to threaten it. However, as Lester Brown highlights in *World on the Edge* (2011), out of threat can also come positive opportunities for change.

Fossil fuels threaten, in varying degrees, both our future and our children's future – if we continue to use them rather than phasing them out. Nuclear energy is hailed by governments as a 'green' answer to these energy problems, but is high-level nuclear waste a hazard we should bequeath to future generations? The renewable family – wind, water, tide, solar and biomass, which produce no greenhouse gas emissions – has to be the principal route to a post-carbon future. As Elliot and Urry (2010) point out:

In the twentieth century, powerful high-carbon, path-dependent systems were set in place, locked in through various economic and social institutions ... As the century unfolded, these lock-ins meant that the world came to be left with a high and unsustainable carbon legacy ... A 'carbon shift' is inevitable. (p. 132)

Both climate change and the shift to a post-carbon society are 'wicked problems': that is, they have no straightforward answer due to their complexity and the differing interpretations people put on them. This is why a number of observers are arguing that we face a long social and cultural transition to a post-carbon society

in the years ahead. David Orr (2009), a leading writer on education for sustainability, argues that for two centuries we've been on a collision course with the ecological limits of the Earth, that these issues of sustainability will not be solved by this generation or the next and that this transition will require all our skill, wisdom, foresight and political creativity. Is this being alarmist, or should geographers and others at least hold these as possible, if not probable, truths?

A post-carbon future

Various commentators have begun to flesh out the parameters of a sustainable post-carbon future. Such initiatives have arisen cross the globe, at levels from the international and national to community and school, transition schemes.

Excellent updates can be found in *The Transition Companion* (Hopkins, 2012) and the Fossil Free UK website, whilst for the classroom there is *Sustainable Schools, Sustainable Futures* (Hicks, 2012) and *Learning for Sustainability in Times of Accelerating Change* (Wals and Corcoran, 2012). The wider subject backdrop is set out in Morgan's (2012) *Teaching Secondary Geography as if the Planet Matters*.

Clearly the notion of a post-carbon geography is still in its early stages and there is everything to play for. By definition it must be critically reflective both in relation to what we teach and how we teach. The difficulties students experience when faced with messages of 'doom and gloom', especially when no space is given for them to share how they feel about this, are highlighted by Kelsey and Armstrong:

We need to acknowledge the enormity of environmental problems, and share our feelings of frustration, anger, sadness, fear and hopelessness. We need to create spaces and opportunities to help kids explore and share their own feelings. We also need to move beyond the narrative of 'doom and gloom' toward more hopeful narratives grounded in resiliency, well-being, happiness and health (Kelsey and Armstrong, 2012, p. 190).

This is not likely to happen unless teachers can be open both to their own and their students' hopes and fears about issues such as climate change. This is why I believe there need to be four dimensions in any investigation of such issues. These are:

1. **Knowing** – what do we need to know about this issue?
2. **Feeling** – what are our hopes and concerns in relation to this issue?
3. **Choosing** – what are our options?
4. **Acting** – what are others doing/might school want to do in relation to this issue?

Education is never merely a cognitive affair, although knowledge is central to good geography. It also has a strong affective element, since learning about people and the environment always gives rise to a range of emotional responses. To leave these unacknowledged is



Figure 4: Loading solar lanterns in Jangoan in rural India, where only half the population has access to grid power. Ashden Award runner-up, OMC, has pioneered the use of solar-diesel hybrid plants to power telecom towers and local people can rent clean, bright lanterns with mobile chargers and portable 'powerboxes'.
Photo: Martin Wright/Ashden.

to only half achieve the educational task. Young people need safe spaces in which they feel able to share both their hopes and their concerns about issues. Feeling heard and supported, as against unacknowledged and dismissed, leaves one with a sense of hope – my feelings are respected, there are others who feel like me. Young people are also less fearful about an issue if they know what adults and other students are doing to help resolve things. This is where it is important to share sustainable success stories, e.g. from the Low Energy Sustainable Schools programme as well as examples of biodiversity protection or building more sustainable communities (Figure 4). Such stories from around the world

show that what can seem unchangeable can be reconceptualised and acted upon (Hopkins, 2012).

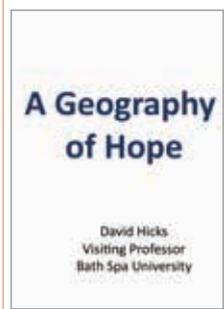
An ecologically and socially active school is one which engages critically with the community in action for sustainable change. The purpose of such change is to build the foundations and develop the skills needed to work towards a post-carbon future. In the absence of such a critically reflective approach geography will merely continue to reflect the high carbon values of an inequitable world. Geography should be the lead subject in these matters. Having been a lifelong geographer I know that the subject is indeed capable of rising to this challenge. | **TG**

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Online resources

David presented a lecture on 'The Geography of Hope' at the GA Annual Conference in 2013. His PowerPoint can be downloaded from www.geography.org.uk/cpdevents/annualconference



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