Science Teacher Education

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An ASE publication for all concerned with the pre-service education, induction and professional development of science teachers

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The Association for Science Education

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Editorial

Following yet another failure to attend the Glastonbury Festival this year (the best line-up for 20 years), I managed to catch a few numbers from one of my 60s heroes, Crosby, Stills and Nash, on the BBC i-player. They played *'Déjà vu'* from the 1970 eponymous album, in which there is the line, *'we have all been here before'*. This seemed to resonate with some recent pronouncements in education; for example, that we are now exhorted (in the Rose review of the primary curriculum) to explore cross-curricular links and topic work as an alternative to subject teaching. A colleague once said to me, *'In education …if you stand still long enough, you'll end up ahead of the game'*. Whilst, educationally, inertia is rarely an option or necessarily a good thing, one can be forgiven a wry smile at how things have a habit of repeating themselves. Whether the fashion 'roundabouts' of curriculum and pedagogy are also seen in teacher education seems less likely, especially in light of the 'MOT tests' for teachers announced in the new White Paper (see *News Roundup*). A bit of *déjà vu* providing a modicum of renewed trust in educational professionals and education research would not go amiss. I am reminded of Chris Woodhead's comment in the 1990s' 'bash the educational establishment' era that teacher educators were the *'academic heart of darkness'* and the riposte from the late, great Ted Wragg, when he referred to the former Chief Inspector as the *'Prince of Darkness'* (Wragg, 1998).

As far as in-service training of science teachers is concerned, there is, thank goodness, no sign of *déjà vu.* Thirty years ago there was little coherent training for science teachers after their PGCE (or Diploma as it was called in those days). At least we are now moving to consensus that Continuing Professional Development (CPD) of teachers matters and is crucial to maintaining a skilled and valued profession, something that the new White Paper endorses. In this issue, we welcome an article from Professor John Holman who, as Director of the National Science Learning Centre, has been at the forefront of moves to assure high quality CPD in science education. He reports that teachers attending courses across the national network of Science Learning Centres report high impact of CPD on their classroom practices and on the motivation, attainment and interest of their pupils. It seems that in science, at least in the UK, we now have some of the best quality CPD ever seen and Holman points to the characteristics necessary to secure and extend it. Fuller research evaluations across the network are being carried out by research teams at York and Leeds and *STE* will report their findings in due course.

Editorial

In Bob Kibble's article, the importance of the 'reflective practitioner' is emphasised. Like John Holman, he sees CPD as a crucial activity to drive forward change in science education. However, reflection on one's own practice can be a self-satisfying and limiting prophecy. In the spirit of a physics teacher, Kibble turns to an optical analogy – reflections do not always help teachers move in new or more productive directions or cope with new curricula or pedagogy; they are liable to total internal reflections within the box represented by 'self'. Instead, Kibble prefers a model of what he calls the 'refractive practitioner', in which CPD is a vehicle for more fundamental change in the 'direction of practice'. Kibble's analogy is a neat device linking well to the articles reviewed in *Research Roundup*, all of which have a flavour of reflection, or is it also refraction?

Two articles complete the four in this issue, both concerned with practical work. Do readers share my pessimism about the skills of current student teachers? My students purport to be enthusiastic proponents of practical work in science, yet I find that their actual ability to carry out class practicals or demonstrations that work, are safe and engaging to pupils, to be quite weak. Perhaps there is room for a special issue of *STE* on this and I invite readers to send me ideas and articles. For now, we have an article from Phil Bunyan and Bob Worley based on their excellent session at last year's ATSE conference (don't forget to sign up for this year's conference – see page 33). Both authors work at CLEAPSS and they survey the problems that novice and trainee teachers have with practical work and offer ways in which CLEAPSS can help.

In a short article for the International section, Allan Blake, Colin Smith and Jim McNally from Strathclyde report on the start of a very important EU-funded project, involving 15 countries, which looks at how 'inquiry-based science' can be promoted in science teaching and the significance for teacher education. In their view, inquiry-based science is more about open-endedness and uncertainty of outcome than routine (prescribed) practical work. *STE* will keep track of this important project and we will report on its progress and outcomes in future issues.

Having read about these exhortations concerning practical science and open-ended investigations and, as a previous member of the Assessment of Performance Unit (APU), I got that feeling of *déjà vu* again. Oh well, time to go and play that Crosby, Stills, Nash and Young album and maybe, just maybe, I can make it to Glastonbury next year.

Editorial

Reference
Wragg, T. (1998) *The Prince of Darkness.* London: Trentham Books

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Future issues of STE

Articles, letters for publication, research ideas and reviews of published material are welcomed. Please submit material for the September 2009 issue by 1st August 2009.

All correspondence and enquiries about the journal content should be sent to the Editor, Martin Braund, at the University of York. E-mail: mb40@york.ac.uk

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Continuing Professional Development for science teachers: the present position and the future

● John Holman

Why is it needed?

All professions are agreed on the need for continuing professional development (CPD) and, in principle, teaching is no exception. This is for a number of reasons, including updating subject knowledge, keeping in touch with new developments in the methodology and providing opportunities for teachers to learn from their peers in other schools. The rationale for science teachers' CPD has been made by the White Rose University Consortium team (2005).

In many professions, the need for continuing professional development is not only accepted but also well-embedded into the professional framework. For example, for lawyers and accountants, systematic CPD is a condition of the licence to practise from their professional associations.

The evidence for what makes effective CPD is well-established (White Rose University Consortium team, 2005; Joyce & Showers, 1988; Ofsted, 2006; Loucks-Horsley *et al*, 1998; Darling-Hammond and Youngs, 2002; Adey, 2004). In a nutshell, CPD needs to be:

- Relevant to teachers' needs – teaching science to *their* pupils in *their* schools;
- Sustained;
- Collaborative, with teachers working together on shared problems;
- Embedded in the culture of the institution;
- Continuous throughout the teacher's career; and
- Involving teachers accumulating, articulating and communicating professional knowledge.

While schools and the education system acknowledge the importance of CPD, systematic embedding in professional practice and in the institutions themselves is still a long way off. It is part of the mission of Science Learning Centres to gradually change the culture of schools towards CPD for teachers.