A year of fieldwork why do we need it?

■ Steve Tilling

September 2015 marked the beginning of the Year of Fieldwork, an initiative launched by the Geographical Association (GA), Royal Geographical Society (with IBG), Ordnance Survey, ESRI and the Field Studies Council. In short, the Year of Fieldwork aims to promote the benefits of fieldwork and secure its future for students studying science, geography and related subjects. ASE will be joining the campaign with a series of activities this year, building on its tradition of fighting for fieldwork as an essential part of science education.

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Steve Tilling provides a personal welcome to the campaign.

ASE and fieldwork

A recent inquiry into science practicals and field trips by the Parliamentary Science and Technology Committee concluded that practical lessons and learning outside the classroom are essential contributors to high quality science education (HoC, 2011). This reflected a strong consensus across the many science educators, subject associations, learned societies and employers, including ASE, who submitted evidence. And yet, a recent School Science Review paper begins with: *'The place of fieldwork in both geography and science qualifications across the 14-19 age range remains contested, unclear and sometimes under threat'* (Lambert & Reiss, 2015, p.89).

Although ASE has supported fieldwork throughout its history, the launch of its Outdoor Science Working Group (OSWG) in 2004 introduced a sharper focus and provided an impetus that has resulted in activities ranging from conference workshops to national policy debates. The most recent of the group's reports (OSWG, 2011) was launched in the House of Commons by the then ASE President, Professor Steve Jones, who said that *'the study of biology, geology and the rest is a living experience and, without fieldwork, it can be (and often is) killed stone dead'*.

The factors that threaten a general provision of science fieldwork in England's secondary schools have remained consistent over many years. The relative importance of these barriers and constraints vary depending on the particular survey and research study, but the list will usually include: inflexible timetabling (in secondary schools); insufficient staff with competence and confidence to teach outdoors; a lack of resources; cost; health and safety worries; inappropriate testing and assessment, and lack of research evidence to support the investment in fieldwork visits (particularly for residentials). Lists compiled in other subjects (e.g. geography and adventure education) and locations (e.g. Scotland) are broadly similar. The proposed solutions will also be familiar to science teachers and are covered extensively in the OSWG report cited above.

This OSWG report and an earlier report on initial teacher education have helped to inform policy, and ASE's work in support of fieldwork (and practical science generally) has undoubtedly kept the topic in public view. There is, however, much more to be done.

The value of scientists and geographers working together

One of the recommendations of ASE's *Outdoor Science* report was to develop more collaborative structures within secondary schools (OSWG, 2011). Ofsted has made similar proposals, encouraging a greater exchange of skills and expertise across a range of subjects including science and geography (Ofsted, 2011). However, implementation of these ideas is a challenge when educators and administrators (including at national government level) spend more time patrolling the boundaries of their subject than looking for synergies. For example, during the recent A-level science

consultations, there was little opportunity to compare and contrast with evidence and expertise drawn from subjects outside science (except, of course, in mathematics). As a consequence, discussions and conclusions in areas such as science practical inquiry and assessment were (in my view) myopic, overly cautious and too deeply wedded to the notion that there needs to be a consensus across all science disciplines.

Nearly 50 years ago, the philosopher Carl Pantin claimed that *'physics and chemistry have been able to become exact and mature because so much of the wealth of natural phenomena is excluded from their study'* (1968). Biology has 'concepts', which allow for properties to emerge (often in a stochastic rather than deterministic way) and, in comparison to other science disciplines, it cannot be reduced conveniently to its components. Biology struggles to fit into sequential modular courses or assessment frameworks, which lack a substantial synoptic component. It adopts non-parametric statistics when other science disciplines largely do not. It is also why whole-organism biology education needs a fieldwork component, whereas *'it is unrealistic to imagine that most chemistry and physics qualifications are likely to give much place to fieldwork'* (Lambert & Reiss, 2014, p.12). Fieldwork is where biologists will encounter much of the wealth of natural phenomena to which Pantin refers.

In short, the 'outdoor laboratory' is where biology students begin to see how things fit together. Being able to make sense of science despite stochastic 'noise' is a skill that eludes most people, even the bulk of the population (including many politicians and journalists), who have had a compulsory science education for 10+ years and still cannot understand why 'facts' cannot be 'exact', or that a simple 'yes' or 'no' answer isn't appropriate.

Any opportunity to exchange expertise and research from across subjects that have a tradition of teaching outside the classroom should be welcomed. Geography is an obvious partner. It has been highly successful in securing fieldwork, for example retaining its place in the secondary curriculum as a compulsory requirement. Educational research into fieldwork is more comprehensive in geography (and earth science). Geography has been more imaginative in the way that it has tackled assessment of fieldwork. Counter-intuitively, when you consider that STEM, by definition, lies at the heart of hi-tech invention, geography is being more successful in integrating smart technology into its teaching in the field.


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My hope is that future science curriculum consultations – and they will happen – will be much more wide-ranging, embracing other subjects such as geography and history. Initiatives such as the cross-subject panel debates initiated by ASE and GA at recent annual conferences, joint workshops, co-authored papers (e.g. Lambert & Reiss, 2015) and, now, the Year of Fieldwork, will set interdisciplinary precedents that help to transform science in secondary education.

References

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Year of Fieldwork
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For more information, please visit: http://www.fieldwork.org.uk/ and to find out more about how ASE is supporting teachers with fieldwork, please go to: http://www.ase.org.uk/resources/outdoor-science/

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