Chapter 5. Geology in Primary Schools

“Don’t call it Geology...no one will come...they will think it's complicated”. Dick Mayhew reported that this was the advice given to him by the Head Teacher of a primary school when he broached the possibility of running an in-service course for primary teachers by his college – St Mark and St John, in Plymouth (Mayhew, 1979). So, it became entitled Plymouth on the rock and the anticipated eight or nine participants turned out to be fifteen ‘very enthusiastic and interested teachers’.

This is perhaps typical of the approach by the Association to the matter of helping teachers in the primary sector, who are seldom qualified in the Earth sciences, and who have to cover a wide spectrum of subjects in their teaching. ‘Topic based’ teaching, which is the norm in most primary schools, means that class teachers will endeavour to look for links between science, numeracy, history, English and other aspects of human experience in each topic that they undertake. It has also generally been more difficult for primary teachers to be allowed out of school for in-service training than their secondary counterparts. Thus, much of the Association’s efforts to help have been led by lecturers in education departments, with little experience of primary schools, or by secondary teachers whose only experience of younger children has been their own! Genuine primary teachers with the flexibility to play a leading role in training others are therefore like gold dust!

From its very inception, the ATG declared its intention to enhance the subject at all levels of education, and the first full Course/Conference in 1968 was addressed by Dennis Milburn about his work at the Froebel Institute (Harpum & Margretts, 1969). His students had successfully carried out some experiments of a geological nature with more than 100 primary children over two years. His conclusion was very perceptive and needed to be reiterated repeatedly over the years, “One surprise had been the degree to which the people concerned with the experiment had underestimated the powers of observation possessed by most of the children”.

The same journal carried a brief article by Stephen Hannath, a junior school teacher (gold dust), in Swindon, who reported on the work that he had done, including taking forty children on a residential field trip to the Dorset coast (Hannath, 1969). Stephen was to continue in a leading role in ATG for several years, keeping less experienced people’s feet on the ground, so far as primary education was concerned, and contributing primary topics to the journal.

At the ATG Conference in 1969, Charles Hallyard, from Rachel McMillan College reported encouragingly that “100 schools had been circulated in southern England. Of these 80% carried out some kind of study of rocks and fossils: 90% had at one time or another followed a programme on how things began – some with a geological reference: and 20% had field experience away from their home area” (Lunn, 1970). And this was 20 years before the National Curriculum!

In 1974, Dr. Frank Spode joined ATG Council. Frank was then lecturing in Geography and Environmental Studies at Sheffield City Polytechnic (now Sheffield Hallam University), and although not a former primary teacher, he was soon involved with covering primary affairs for the journal and managed a yearly update for all members to read. He established a mailing list of up to 17 people, again, mostly from the world of teacher education, rather than serving primary teachers, and in 1977 they provided materials Geology Teaching 2(1), which focussed on the primary sector.

In 1978, the Association took a fresh look at all its different activities and set up a series of Working Groups, with Frank Spode being the obvious choice to convene the Primary Group. By now, various curriculum development projects were being developed, including Junior
Nuffield Science and the Schools Council 5-13 Science schemes. The output from these was aimed at teachers themselves and it was found that some teachers found it difficult to devise pupil-friendly materials, especially if they lacked a science background. The Schools Council therefore set up the Learning through Science project to produce work cards for classroom use, and ATG members soon became involved in devising cards for the geological content (Williams, 1981). These were published in 1983 by MacDonals, with the titles, Fieldwork, Rock Testing, Soils, Crystals, Riches of the Earth and Past Environments.

The Primary Working Group seems to have made a scoop with a request from the BBC for help in making a TV programme (Spode, 1985). As often happened, an enquiry from an external body was sent to the ATG President (Dr. Reg Bradshaw at this time), who passed it on to the relevant group. The programme was called Spaceship Earth, in the Zig-Zag series on BBC2 and involved borrowing a class of 10 year olds at a Sheffield school. These were filmed carrying out a circus of practical activities in class, followed next day by a trip to a churchyard to investigate rock types and their response to weathering. All very exciting, and it sounds as though the venture was successful when it was aired in 1986. I wonder if the BBC still has the result in its archives!

To judge from back numbers of the journal, it would appear that the Primary Group achieved another first – in the establishment of in-service training (INSET) for serving primary teachers during one day of the Association’s Annual Course/Conference. After a small start at the Cheltenham Course/Conference in 1982, numbers picked up healthily, with 17 at Reading in 1983, 12 at Leicester in 1984, and 22 when ATG returned to Cheltenham again in 1988, and so on. In all these cases, the Local Education Authorities gave their full support and their Advisers ensured that good publicity was sent round the schools within range of the conference venue.

By 1989, there were sufficient activities suitable for primary age pupils published through the journal for Jane Bayley to collate them in a compendium called Down to Earth in the Primary School, which sold so well that a reprint was necessary (Spode, 1989).

The arrival of the National Curriculum in 1988 acted as catalyst to the Primary Group. In responding to the demands of Government, in just as short a time scale, many hours of burning midnight oil produced a wealth of resources for primary teachers. In that year John Reynolds returned to his primary roots after 15 years’ teaching geography and geology in secondary schools, becoming ATG Treasurer in 1985 and helping out with the KS3 & KS4 Science of the Earth Units. He began developing primary resources with his own classes of Year 5 & 6 pupils. A kit of 15 common rocks and related worksheets was the result. As part of the government’s 20-day course over two years for Primary Science Co-ordinators, John was asked to provide half a day on Earth Science for Staffordshire County Council / Keele University Education Department at several locations in the county. All teachers went away with enough rock samples, ideas & enthusiasm to get started! His wife, Mary, and her class were particularly enthused with making a working model of a well.

The Group expanded into the 1990s to include Jenny Claringbold and Graham Kitts from primary schools in Yorkshire, Ian Thomas and Kay Hughes from the National Stone Centre (NSC), Derbyshire, Mick Revell and Sue Pryor from Northampton Science Centre and Jean Cooper from the Natural History Museum. Peter York, teaching 6th Form geologists, had been asked by his own children’s primary school to “do something on the local geology”, and had worked up a suitable programme in conjunction with the primary teachers, learning much
about the age group in the process. He had asked an A Level geology student to accompany him into the school, knowing that the student would be bound to revise the topic carefully before the event, so as to be able to handle the children’s questions. No doubt this also helped the student to be confident in his own A Level work. As a result of this event, Peter became involved in the Association’s Primary Group and he actively encouraged other secondary teachers to do the same, both in assisting with INSET at conferences, and in offering to be geological mentors for local primary schools.

The ruins of Pompeii are an example of fossils.
Howler from Geology Teaching 5(4)

A major venture started by the group in 1993, and continued, against all the odds, to the present, is the regular publication of an activity guide for primary schools, *Teaching Primary Earth Science*, known to insiders as PEST! It has been rebranded in 2013 to celebrate its 20th year by bringing the name in line with the acronym, so it will be called *Primary Earth Science Teaching* and the logo has been redesigned accordingly. The first issue was devoted to the non-curriculum topic of *Fossils* and was published as a pull-out in *Teaching Earth Sciences 18*(1) and made available to non-ESTA members for a separate subscription. Many thousands of extra copies were printed and sent out as inserts with *Primary Science Review* [ASE] and *Teaching Primary Geography* [GA]. For many years the ESTA Primary mailings were handled by Peter York’s wife Katherine – if you can’t beat ‘em, join ‘em! Subscriptions to PEST seemed to have peaked at around 300 in 1995.

These were hectic times spent keeping up the momentum with PESTs and developing other topics for INSET. One of the most memorable events of those years was the 1994 ESTA Course/Conference in Birmingham. Because of late bookings, there were double the numbers originally expected for the Primary INSET, requiring not only an extra lab but 20+ extra rock kits and encore performances by the Primary Group. Teachers suggested that the minerals workshop be published as an issue of PEST [no 9] and one of the participants, Niki Whitburn (then a primary teacher in Birmingham) joined the group. She later moved to teacher education at Bishop Grosseteste University College, Lincoln. Another Brummie teacher, Stewart Taylor, joined later, as did Gill Odolphie, who helped to set up the East Mendip Study Centre.

The group also collaborated to produce teaching packs, based on the INSET materials, notably *Working with Rocks* and *Working with soils*, both funded by the Denis Curry Charitable Trust and available for sale. A further pack dealing with water and rivers is in the pipeline, to coin a phrase. A casual conversation at a Geographical Association Conference led to the Group's involvement in the Ordnance Survey publication of the *UK Geology Wall Map* in 1997. Payment was in kind, with ESTA receiving a stock of maps to sell.

Edinburgh Castle Rock is a granite plug
Howler from Geology Teaching 5(4)

The Primary Group has continued to respond to the ever-changing demands of curriculum revision up to the present. Given that yet another review is awaited, the members have focussed on cross-curricular issues, as both a basis for all types of work, and of getting geology – in its broadest sense, into the classroom. (e.g. soil painting, edible rocks).

Niki Whitburn led the group for several years until becoming ESTA Chair in 2008, when she passed the baton to Tracy Atkinson. Being a peripatetic music teacher, Tracy is able to spread the word over a wide area of Lincolnshire. The Group has also reason to be extremely grateful to Ian Thomas, the Director of the National Stone Centre at Wirksworth, Derbyshire, for finding it a regular meeting place and some space for storing conference teaching materials. NSC volunteer, Geoff Selby-Sly, is a useful member of the Group, spreading the word to schools that visit NSC.
From 2004 to 2008 the Group was involved in the, Earth Science On-Site initiative of GeoConservationUK [then UKRIGS], managed by John Reynolds and funded by levies on the aggregates industry. The Project involved writing Earth science field teaching activities for non-specialist teachers at former aggregates sites. The National Stone Centre (Derbyshire), Park Hall (Stoke-on-Trent), Barrow Hill (West Midlands) and Tedbury Camp (Somerset) were sites where members of the Primary Group helped with writing and trialling the materials. Not surprisingly these ventures provided material for several issues of PEST.

Another opportunity for a topic for PEST came with the Primary Group’s involvement with the BGS’ Poster, Climate through Time, and PEST issues for 2010 were centred around it. A free copy of the poster was sent with all these issues of PEST and it is now also available, free, on the BGS website.

John continues to bash down rocks in his garage to produce attractive rock boxes, aimed mainly at primary schools, and mostly used at INSET and marketed at conferences. As well as providing INSET in the time-honoured way at ESTA gatherings, the Primary Group also offers courses at the conferences of the Association for Science Education and the Geographical Association. The link with the Geographical Association is a long established one, and Niki Whitburn helped set up their physical geography special interest group, later becoming co-chairman of it with Duncan Hawley, to ensure both a primary and secondary focus.

It is interesting to see the mentoring idea being resurrected in recent years by ESTA, notably for experienced members to volunteer to mentor newly appointed teachers of geology in secondary schools. Some university Earth Science departments also now operate a mentoring scheme, whereby 3rd Year undergraduates obtain credits towards their degrees by undertaking work in schools in conjunction with the class teachers. At the ESTA Course/Conference in Durham in 2011, a particularly impressive presentation was given by an undergraduate who had worked in a local junior school, and all felt that he was truly following his vocation by embarking upon a PGCE course. He was duly given an ESTA membership form – maybe he will wish to join the Primary Group in due course, since it is currently the smallest it has ever been, with just four active (but very energetic) members!

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**On river action - Of course such changes are too dictatorial to conform to the veracity of nature**

Howler from Geology Teaching 5(4)

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On a granite - We placed the specimen under the pulverised microscope

Howler from Geology Teaching 5(4)

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**Figure 4** Primary teachers leaving a workshop with ESTA rock boxes (Bristol Conference, 2006)

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**Trilobites moved by means of pleurae which contracted and expanded the bellows thus propelling them**

Howler from Geology Teaching 5(4)

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**Other sedimentary rocks are formed organically from the testes of small marine animals**

Howler from Geology Teaching 5(4)

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**Fluorspar occurs in octahedral cubes. (One can sense the meaning!)**

Howler from Geology Teaching 5(4)