Geophysical Research Abstracts
Vol. 15, EGU2013-2638, 2013
EGU General Assembly 2013

Field Geology Reasoning Skills in the Classroom

Alan Richardson
Halesowen College, Whittingham Road, Halesowen, West Midlands, United Kingdom (arichardson@halesowen.ac.uk)

When geology students are confronted with their first rock exposure, they are often bewildered by the volume of information available and the need to filter out the irrelevant and unnecessary while recording the remainder in a format that lends itself to later analysis. In spite of the problems, the first experience of fieldwork provides many students with the inspiration to devote themselves to this branch of science. The critical factor appears to be the realisation that many of the vaguely interesting topics that have previously been studied in isolation all contribute to an understanding of the rocks in front of the observer. Even with only basic facts and limited understanding, the willing student rapidly gains a deeper appreciation of the ways in which the disparate fields of geoscience are inter-related. However, the initial enthusiasm this generates can be lost if the student is unable to record the information systematically and analyse it logically.

The current project seeks to develop in students the intellectual skills necessary to analyse an exposure. In many ways finding the answers to any exposure's history is easy; the difficult part is formulating the right questions. By creating a series of 'Outcrop Exercises', I am seeking to imbue students with an appreciation of the way a structured series of questions can lead to understanding. If they go into the field knowing the sort of questions that they will have to ask themselves, they are more likely to understand the nature and purpose of the data they will have to collect.

The earliest exercises were designed to enhance a stratigraphy course, and were intended for use by students who already had field experience. Rather than providing them with accepted facies models for the geological past, the data and questions with which they were provided allowed them to generate their own environmental interpretations. The success of these suggested that they had wider applicability: they could be used to develop essential reasoning skills before going into the field; they could form the basis of follow-up work after a field day, or could be used as a substitute for field work if severe weather prevented an excursion.

Each Outcrop Exercise consists of an A3 data sheet, a question sheet, specimen cards and, if appropriate, topographic and geologic maps. The most important dimension of each exercise is the nature and structure of the questions, which begin by requiring the student to make simple observations and lead to a comprehensive interpretation of the exposure. The materials are intended to be used in a variety of ways: for example, if the resources are available it is preferable to replace the specimen cards with real specimens; if time is short, data processing can be omitted by supplying students with prepared graphs. With future developments, it will be possible to link exercises together to generate a geological history for a whole area from primary data.

These exercises must not be seen as a substitute for real fieldwork, but it is hoped that they will enhance students' appreciation of the data that they must collect in the field.