3. Managament and Educational Use of Earth Science Sites in Great Britain

By KEITH L. DUFF*)

3.1. Introduction

The relatively small size of Britain, with its high overall population density, means that there is a good deal of pressure on geological and geomorphological sites which are used for teaching or research. In many cases management of the site, either directly or by publishing guides which direct students to sites which can accomodate heavy use, is the best way of protecting the site so that it will remain usable in the future. This paper explains how site management is carried out, and shows how educational use is channelled towards appropriate sites.

3.2. Site Management

Management of geological sites in Britain is largely concerned with maintaining them in a state where they can be used for study. This usually consists of little more than ensuring that they are not destroyed or damaged through infilling with waste, through being built upon, or through being quarried away. Only in a relatively few cases does management consist of taking positive action to re-expose geological exposures, and this only usually happens when the site is owned or managed by a conservation organisation. Generally, site management is of an indirect nature, concerned with maintaining the status quo. This is mainly carried out through the operation of the physical planning legislation in Britain, and principally through obligations placed on the planning authorities as a result of specific localities being notified by the Nature Conservancy Council as Sites of Special Scientific Interest (SSSIs).

When geological SSSIs are threatened by development proposals it is often possible to negotiate and agree modifications of the schemes, so that a multipurpose land use which combines conservation and development is evolved. Many such agreements are negotiated with developers by Earth-scientists from the Nature Conservancy Council (NCC), with great success. For example, factories have been built in old quarries, but the rock faces have been left undisturbed, and building has been kept away from them, so that geologists can continue to study them. In other instances, important geological sections have been retained as parts of waste disposal schemes.

Direct management of Earth-science sites fall into two groups, those managed by the NCC and those managed by others. The NCC has indirect control over SSSIs, and can influence development proposals at them, even though it does not own them, and only has formal management agreements over a small percentage of others. However, few of our nationally important geological SSSIs have been destroyed, and the SSSI system continues to be an effective way of protecting Earth-science localities. In the case of National Nature Reserves (NNRs), the NCC has much greater direct control, either by owning, leasing or managing the land. Of the 234 NNRs, about 10 % contain nationally important Earth-science features, and these are much less at risk from damage than most other sites.

Other organisations who safeguard geological sites through management include local councils (who manage Local Nature Reserves), and the voluntary nature conservation trusts. The latter consist of a series of independent local groups made up of keen amateur and professional naturalists and Earth scientists, who own and lease land which is managed as nature reserve. Some of these are of geological interest, and British geologists are trying to increase the involvement of these local trusts in conserving Earth-science sites.

In addition, local geologists are working with the NCC and with national organisations such as the Geologists Association and the Geological Society to set up a system of "Regionally Important Geological Sites" (RIGS). These are notified informally to local councils, who are asked to do what they can to protect them as local assets.

At all of these sites positive management for geology is sometimes undertaken. This normally takes the form of excavations made by bulldozers or other machinery, to re-expose rock sections which may have been hidden by fallen rock, soil or vegetation. Many long-lost classic geological sites in Britain have been resurrected in this way.

3.3. Educational Use of Sites

In Britain, Earth-science sites are conserved so that they can be used for teaching or research, not so that people can be stopped from using them. There are very few sites in Britain which are so vulnerable that any form of access control has to be employed. However, there are undoubtedly a number of sites which could be damaged if they were used for teaching or collecting by too many people, and so the NCC has a policy of publishing geological guidebooks to specially chosen sites that can accomodate heavy user pressure without being damaged. This "diversionary" approach has been used in a number of areas, and depends upon making sure that the sites in the guide are easy to get to, show good clear features, and are well explained and described in the guidebooks. Our Mendips and Malvern guides fall into this category.

Other guidebooks direct geologists to smaller areas, or individual sites, which again are unlikely to be damaged by excessive use. To make sure that good fieldwork practice is encouraged, the guidebooks

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suggest exercises which may be undertaken at the sites, and these are intended to teach students to observe and think, rather than use their hammers to no useful purpose.

Other sites have been developed for local use, with notice boards and other facilities. Some of these have been developed by local councils, such as the Permian reef at South Elmshall in Yorkshire, where the local authority has worked closely with NCC and with the Geologists Association to produce a much-used teaching site.

Other initiatives include the publication by NCC of a manual for teachers of geology, which encourages the wise use of geological sites through the use of series of case studies which give examples of how sites can be used in novel ways.

In the longer term, it is important to raise the awareness of geology amongst landowners and the general public. The NCC is doing this through the production of a series of simple leaflets which explain what various elements of geology are all about. Other leaflets are being written specifically for planners, for the minerals industry and for policy-makers, to explain how and why geology is relevant to them. This form of general education is vital if geological conservation is to become better understood and more widely supported.

3.4. Conclusions

Management and educational use of geological sites are very closely linked, and we should become more innovative in our management of sites for teaching. In doing this it is most important that we build up more awareness of geology and its significance to the industrialised society in which we live, amongst the general public. Without this, geological conservation is always going to be a minority activity, poorly understood or supported by policy-makers, planners and landowners. It is important to all geologists that we succeed, and closer links between geological conservationists throughout Europe can serve as a powerful way of raising the profile of our work.

4. Geological Sites and Raw Material Exploitation

By STEEN ANDERSEN*)

4.1. Introduction

The exploitation of raw materials has a great influence on geological monuments as well as on the general geological environment. Such exploitation has a massive and largely negative impact on landforms but, on the other hand, one of the consequences of mineral working is to open up geological sections and make them available for study – an important fact of life in a country of low relief like Denmark.

Ideally, geological investigation should follow closely on the exploitation of raw materials so that the benefits to geology are maximised or, at least, so that the injury caused by mineral working is minimised. In achieving this, the Raw Material Act provides Earth scientists with a useful tool.

The Danish Raw Material Act has four functions:

1) It ensures that the areas to be exploited are optimally located through the operation of the regional planning process.
2) The permissions given under the Act regulate the timing of the exploitation.
3) The plans for extraction and restoration describe in detail the pit as it will be during and after exploitation.
4) An economic guarantee is required and this secures that the restoration plan is followed.

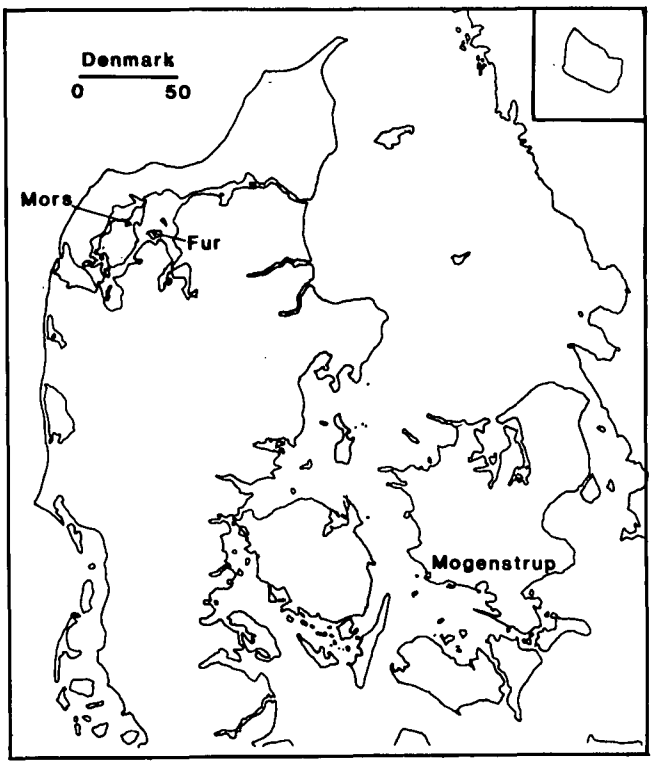

Fig. 2.
Locations mentioned in the text.

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