

Assessing resources in the UK and overseas

David Harrison

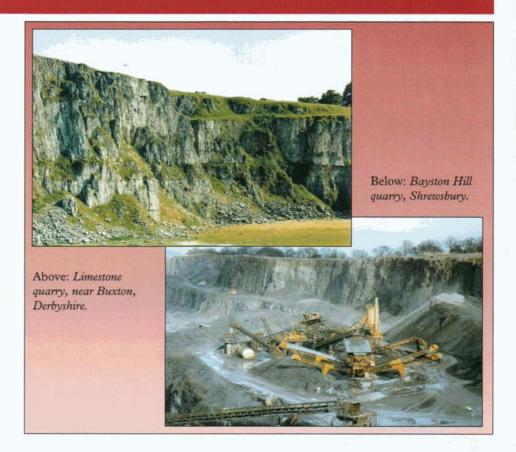
Keyworth

The construction industry has a basic need for rocks and minerals to be used in buildings and the worldwide demand for constructional raw materials continues to increase.

Limestone and clay are fired and mixed with gypsum to produce cement. This is then mixed with aggregates (crushed rock particles or naturally occurring sand and gravel) to produce concrete which can be manufactured with sufficient strength to allow the construction of roads, bridges and buildings of all sizes. Aggregates are also widely used in road construction. The demand for aggregates for use in modern road systems is enormous. In most countries large volumes of crushed rock (limestone, sandstone, dolerite, granite, etc.) as well sand and gravel are used in road construction and concrete production. Fired clay bricks are also an important building material and building stone still occupies an important place in architecture, particularly in the construction of prestigious buildings.

Most extraction of raw materials for building is by open pit quarrying and their extraction frequently gives rise to environmental problems which may be

Building materials



visual scars on the landscape or related to increased levels of noise, traffic and dust, or groundwater pollution. Landuse conflict is therefore often associated with the extraction of building materials. These problems and conflicts can often be minimised by knowledge of mineral resources distribution at local, regional and national levels.

The BGS carries out research on the technical qualities of rocks and minerals for construction and on assessments of resources of raw materials for building. The former utilises the mineralogical and aggregate testing laboratory facilities at the BGS to characterise the physical, mechanical, mineralogical and chemical properties of constructional raw materials. Assessments of resources of specific deposits have been carried out extensively by the BGS both in the UK and internationally. Such investigations in the UK have concentrated on the appraisal of aggregate resources, mainly sand and gravel (both onshore and offshore) and limestone and other hard rock deposits under commissions by the Department of the Environment. These studies aim to evaluate the distribution and quality of

resources to facilitate rational land-use planning and development.

Recent work overseas has included investigations of aggregate resources on small island communities in the South Pacific, studies of cement grade limestone resources in southern Thailand and several investigations of building stones and clay raw materials for brick making. BGS staff have also given a series of training workshops in developing countries on the methods and techniques which are used for investigating constructional raw materials. All these overseas projects have benefited from support provided by the UK Department for International Development (formerly the Overseas Development Administration).

There is currently continuing interest in the substitution of quarried aggregates by alternative secondary materials such as china clay residues, slate waste, construction wastes, slag and power station ash. The BGS is currently involved with projects to evaluate waste materials and to investigate their potential applications as building materials.