

## CORRESPONDENCE

## Geology and Wealth: the Future?

The editors of the *Geological Magazine* have decided to reprint this article on the future of funding of geological research in the U.K. because of its importance. It has been widely circulated during 1985 and 1986 and will be brought to the attention of Parliament in the very near future.

**UK Geological Sciences in Danger**

Geological expertise and information are essential in the exploration for, and exploitation of, fossil fuel, mineral and water resources, in civil engineering, waste disposal, and environmental planning. These industries are large and profitable. In 1983, UK mineral production (including gas, oil and coal) was worth £24 billion, making the UK the seventh richest country in the world in terms of mineral wealth, ahead of both Australia and South Africa. **The financial returns to the UK Government from geology-based industry are high. In 1984, tax and royalty payments from North Sea oil alone were £9 billion.** The services and equipment requirements of this industry are huge. About £4 billion is spent annually by the oil companies of the western world on geophysical surveys, whilst the manufacture of geophysical, mining, quarrying and processing equipment are major industries in their own rights with both home and overseas markets.

The basic requirement of these resources-based industries is geological information which comes from three separate sources – from companies, Government institutes and universities. **UK non-industrial geological research is endangered. This is due to inadequate funding which comes from Government, mainly through the Natural Environment Research Council (NERC).** It goes to universities as research grants and studentships. Government research establishments, such as the British Geological Survey (BGS), are NERC institutes which undertake both contract research for other Government Departments and basic research using funds provided by the Department of Education and Science (DES) through NERC (the Science Budget). Over the last five years, NERC funding to the geological sciences has declined to such an extent that in 1983/84 it was only 0.00015% of the GNP or, more pertinently, 0.0043% of Government revenue from North Sea oil. The present situation is such that in universities many excellent research projects go unfunded, major items of equipment, essential for state-of-the-art research, cannot be replaced or purchased, and continuing participation in major international research projects is impossible. Since 1981/82 the British Geological Survey's income from commissioned research has fallen by 35% and that from the Science Budget by over 40%. Commissioned research, although drastically cut, seems to be regarded by Government as a desirable BGS activity. But systematic Survey work on land and offshore, and the development of a national computer-based data bank, essential for all geological research, have virtually come to a halt.

It is such a dire situation, that the following question must be asked and answered. **'Does Government believe that, on the basis of its contribution to major wealth-generating**

**industries, research in universities, polytechnics and institutes is worth saving?'** The common Government response is that if industry wants it, industry will pay for it. Industry usually replies that, as they have already paid for it in taxes and royalties, Government should pay. Faced with this impasse, Government has indicated to universities and institutes that if they wish to do research they must generate their own income through consultancy service. Although this activity is increasing, it cannot develop far before coming into direct conflict with consultancy services provided by the private sector. It can therefore meet only a small part of the costs.

As a group of industrial, academic and institute earth scientists, we believe that Government under-values the contribution of university and institute geological research, and emphasise the following points. Industry needs, in order to start exploration and prospecting, a comprehensive geological data base. First, a nationwide on-going geological survey is required that identifies the general spatial distribution and structural relations of rock types. Modern geological mapping entails detailed geophysical, geochemical and petrological investigations that identify the physical and chemical properties of rock types within a three-dimensional framework. Second, an archived inventory is required that contains all available geological data from industry, Survey and university sources and is easily retrievable. The systematic surveying and database maintenance, required by all geologically-based industry, have been the responsibility of the Geological Survey (BGS) for 150 years. These data cannot realistically be accumulated, collated or disseminated by any other organisation, and should continue to be a service provided by BGS. At present levels of funding the database cannot be maintained, still less backed up by necessary research in BGS to upgrade the service.

Universities not only train and retrain earth scientists but are the home of basic research. It is a repeatedly proven maxim that today's basic research is tomorrow's applied research. The location of oilfields in the global tectonic framework, the evolution of sedimentary basins that controls the maturation of hydrocarbons, the role of extensional tectonics in determining oilfield structures, the production of geothermal energy from hot dry rock, the understanding of hydrothermal processes that produce massive sulphide ore deposits, and the facies control of oil and gas reservoir-rock characteristics are a few examples of UK university research topics that have had important industrial applications. With progressively diminishing funding and more time being spent on seeking alternative finances, there is no doubt that UK university geological research cannot maintain either its industrial usefulness or its present international pre-eminence.

Given the case has been made that UK institute and university geological research is worth saving, what has to be done? **A re-evaluation of research funding mechanisms is necessary because the roles of university and institute are so different that this duality has to be reflected in financial, administrative and managerial structure. In the short term, an urgent injection of an additional £15 million per annum, earmarked specifically for geological sciences, is required**

adequately to fund systematic surveys, to computerise national data banks, to re-equip research centres of excellence and to allow UK participation in major international projects. The role of NERC needs to be evaluated and the rationality of its recently published Corporate Plan assessed. The establishment of a Director of Earth Sciences with the responsibility for all non-industrial geological research could markedly improve research direction and co-ordination but only if he or she reported directly to NERC Council through its Chairman.

**The following are essential and fundamental requirements:**

- (i) Continuity of adequate funding for the 'core' activities of nationwide systematic geological surveys, data accumulation, collation and maintenance.
- (ii) Regular, independent and responsible scrutiny of those activities by the whole user community – Government, industrial and academic.
- (iii) Clarification of the overall scope, scale and functions of a national survey, its relation and interaction with other parts of the geological sciences community, and its source of long-term funding and involvement in short-term contracts.
- (iv) Continuity of funding for university-based geological research at a level that allows academic scientists to compete internationally, and allows universities and polytechnics to hire the best minds and attract more industrial support.
- (v) Rationalisation of the number of expensive geological

facilities maintained at NERC institutes, universities and polytechnics, and updating and strengthening of those that are retained.

**In essence, many UK wealth-generating industries rely on geological research and information, but current Government funding policy is putting this research in jeopardy; realistically, more of the resulting revenue should be ploughed back.**

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