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Mountains of fire from the present to the past - or effectively communicating the wonder of geology to tourists

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Abstract. Europe is the birthplace of scientific geology. Much has been achieved in site recording, conservation and latterly, focused on the scientifically important interpretation and preservation. Some sites and collections are tourist attraction. Others await "geotourism" development before they are lost. Interpretative media and visitors typology models are presented. Exemplars are given from North America and Europe. A "geotourism" development strategy is proposed.

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Introduction

"Tongues" from the Past

Nicholas Steno, arguably the Renaissance founder of modern geology, managed to upset the Maltese tourist trade in fossil sharks' teeth, and noting that: *"What we see is beautiful, what we know is more beautiful, what we cannot grasp, most beautiful"* he focuses our attention on the wonder that individual geologic discovery can bring. His contemporary, Agostino Scilla wrote on Sicily: *"I have no idea how the sea could reach so far into the land . . . the corals, the shells, the shark's teeth, the dogfish teeth, the Echinoids . . . have indeed been petrified . . ."*. Geologists have discovered much about geology, using Europe as the test bed, since the seventeenth century! His work and collection, in the Woodward Museum (Cambridge, England), draws our attention to the complex interrelationships between geologic discovery, history, conservation and promotion for: *"Europe was the birthplace of geology and the continent where the main features of the geological record were first worked out. This happened because of the accident of human history that brought together the right level of civilisation and the right men at the right time, and because of the accident of geological history that brought about the great diversity of rocks in Europe which gave those men their opportunity"* (Ager,1980, p. 1). Little of the wonderment of geologic discovery, in the overall pursuit of scholarship, is communicated to the public by most interpretative schemes. Geology's interest and societal benefits are often masked by the choice of scientifically important and usually somewhat obscure and difficult to access, rather than touristically interesting, sites for interpretative provision; Fig. 1 (Hose, 1997) highlights this issue. Consequently, there is limited public awareness of the richness and cultural significance of Europe's geology sites; to maintain and develop these, geologists must present and promote, as well as any scientific, their overall societal value for geologic discovery has shaped the mindset of Europeans.

Geotourism and geologic conservation

Neither national nor European-wide performance indicators exist with which to gauge the "success" of geologic interpretative provision; these would need to measure the intangibles of visit quality, visitor perceptions and any linked behavioural changes, as well as knowledge and understanding gain. Few interpretative schemes are based upon an evaluation of visitor types and needs. Few summative remedial evaluations have been undertaken. Hence, research has

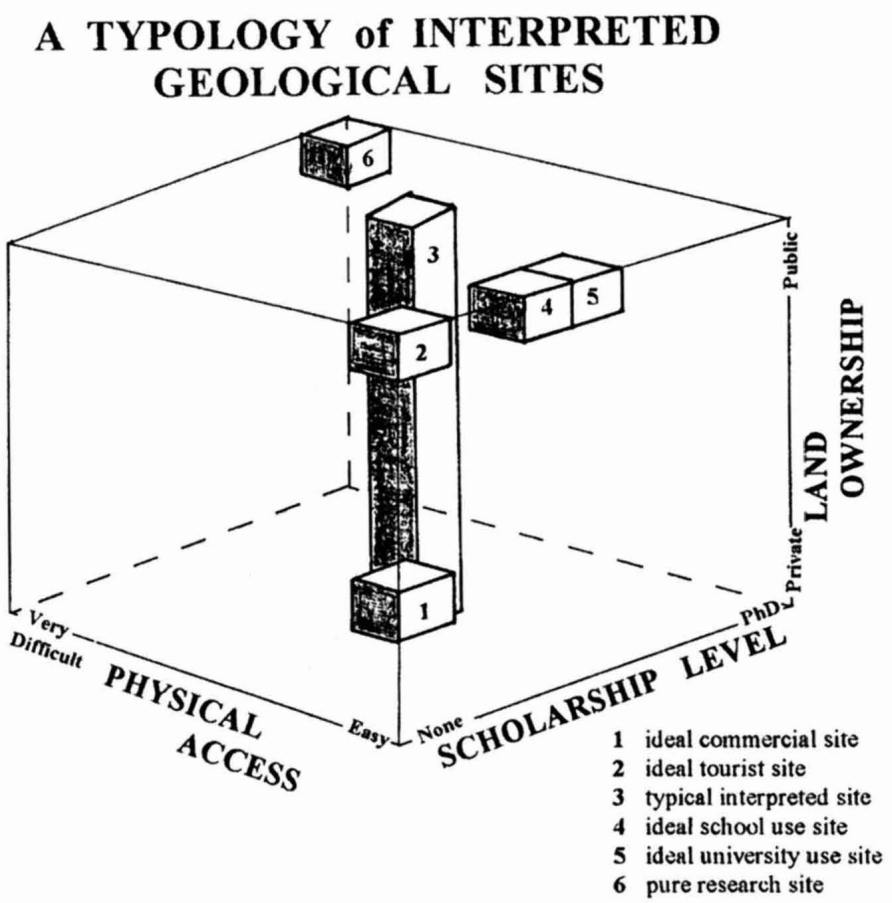

Fig. 1

been undertaken within the framework of **"geotourism"**: *"The provision of interpretive and service facilities to enable tourists to acquire knowledge and understanding of the geology and geomorphology of a site (including its contribution to the development of the Earth sciences) beyond the level of mere aesthetic appreciation"* (Hose, 1995), to rectify this situation. The adoption of geotourism as a framework for conserving Europe's geologic heritage should constituency-build for that heritage and generate some funds for its upkeep at a time when many governments' funding for conservation is being reduced. Its key elements are collection and site-based preservation and conservation measures, together with heritage tourism promotion. Geologic conservation, essential to geotourism's long-term future, is exploitive in nature since limited collecting is often required to maintain site visibility and accessibility. The challenge is to develop geotourism without irrevocably damaging its physical basis; fortunately, there is no real evidence to show that general visitors, such as tourists, as opposed to student and academic geologists, cause any major damage to sites (Badman, 1994).

The nature of geotourists

Common geotourist characteristics

UK-based research (Hose, 1994a, 1996a,1996b, 1997, 1998) has recognised some general geotourist characteristics:

01. The majority are casual arrivals;
02. Very few have any competence in geology;
03. At specific geologic attractions they tend to be above the national average for educational attainment and have some expressed interest in the subject;
04. About one-half regularly read a tabloid newspaper;
05. Many, except those from areas of "classic" geology, are unaware of the importance of the UK's geologic heritage;
06. About one-quarter have some limited understanding of geologic heritage conservation issues;
07. Adults are usually over 30 years of age and in couples or small family groups with children of primary or lower secondary school age;
08. Satisfying childrens' perceived educational needs motivates adults to visit geologic sites.

Additionally, they are usually inadequately equipped for outdoor activities and stay within about 400 metres of their vehicles. Expressed geotourist behaviour is that:

01. Interpretative panels are viewed, for about a minute, by at most about one-quarter;

02. They least access geology interpretative panels that are in competition with other, especially topographic and wildlife, subject matter;

03. Geology interpretative panels are most effective when they employ: 'word-pictures', limited technical terms, a focused storyline, and simple bold illustrations;

04. Most express some, frequently much, appreciation, of interpretative panels and exhibits; "hands on" facilities are especially popular.

Additionally, guided walks and accompanied field excursions are very popular; they like the opportunity to "ask an expert" and explore the unknown in the safety of the company of others. Finally, Geotourist's purchasing patterns are that:

01. Most are prepared to pay a modest (but much less than say for an amusement park or cinema seat) admission fee; many expect some form of family admission concession;

02. Few buy, even inexpensive, geologic publications; most expect leaflets to cost very little or to be free;

03. Collecting equipment and souvenir items are quite popular retail items.

Effective geotourist interpretative provision

The same research also indicates that geologic interpretative provision can attract, hold and inform tourists whose information recall rates can be quite good (Hose,1994). General interpretative considerations have emerged from geotourism and similar environmentally-centred research; it has been found that tourists:

01. Bring their past experiences;

02. Have first impressions that influence immediate and future usage;

03. Have knowledge and perceptions different to those of geologists;

04. Learn best when actively involved in the process itself.

Further, communicatively competent interpretative provision provokes tourists' interest and curiosity, relates to their life and reveals, as part of an overall integrating theme, specimens' and sites' stories. It also presents information at an appropriate academic level, fires their imagination and in so doing imparts something of geology's fascination. Purely descriptive provision is ineffective. The attracting and holding power of bold graphics that save on, and are more memorable than text, is significant; the move to photorealistic graphics might well be at the expense of visitor recall. Much more attention needs to be given to the vocabulary and style of site literature and panels; frequently, their message is complex, confused and irrelevant to general tourists' experiences. Interpretative media that attract, hold the attention of, and informs tourists:

01. is essentially visual;

02. use graphics to explain what is written or displayed;

03. use bold line graphics;

04. employ a text hierarchy;

05. has limited text content in short, simple sentences;

06. relates to users' past experiences;

07. is at a comfortable viewing height and distance;

08. is aesthetically pleasing.

Geotourists and interpretative provision

Whilst geotourists can be regarded a being part of a continuum spanning a wide range of interests and aptitudes they can, for convenience of descriptive analysis, be placed within a number of groups; these can then be matched to interpretative provision as examined in Fig. 2. For example, we might usefully choose to consider the extremes of the "beetles" ("postgraduate and graduate level geologists", making use of typical field guides and published research to reinforce their field skills and knowledge) and the "butterflies" (general tourists, lacking commitment to geology, and attracted to sites by bright display panels and/or trail leaflets; they wander from one site attraction to another and move on when things become dull or intellectually difficult for them). The former are a relatively well catered for minority interest. The latter are the majority, and potentially more influential constituency, for whom geotourism provision is principally intended. We might also consider other categories such as the "ants" ("amateur geologists" who like nothing better than to purposefully turn-over some spoil heap) and the "wasps" ("students", especially from junior schools, that swarm over the popular accessible sites). Whilst such categories might appear frivolous compared with more formal ones, like all good interpretation, they are memorable summations of real events and experiences.

Geologic interpretative provision considered

Interpretative trail practice

Geologic trails and on-site information panels have the potential to actually involve the user in the learning process within the real world; all feature some aspects of:

A. Traditional Trailside Themes

01. Lithological - description of rock units and types;

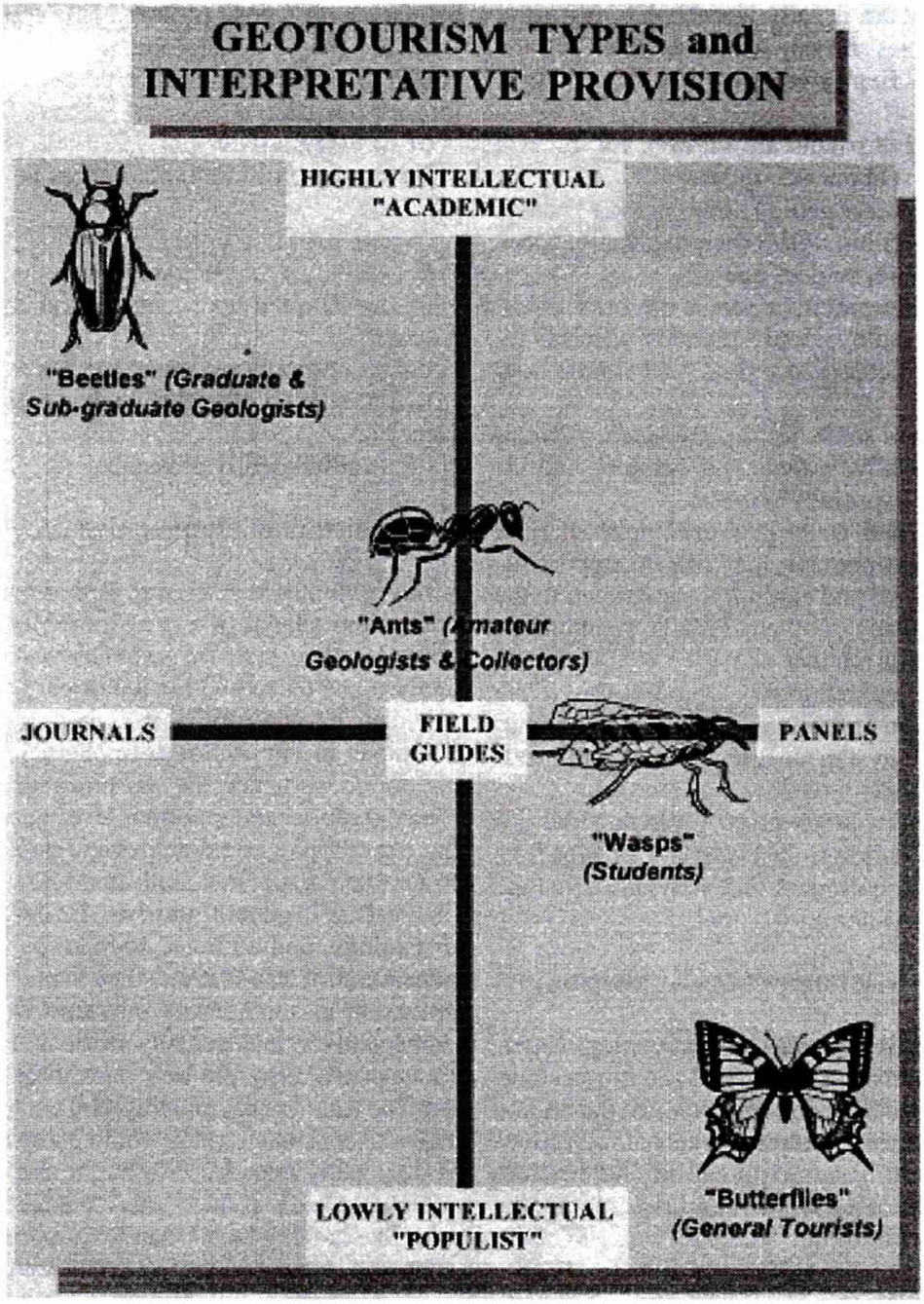

Fig. 2

02. Stratigraphical - the sequence of rocks and the implications;

03. Structural - tectonic features and their implications;

04. Palaeontological/Mineralogical - to examine or collect.

And:

B. Tourist Friendly Trailside Themes

01. The Unusual/Unique - the oldest rock or fossil type;

02. Internal forces - faulting , folding and earthquakes;

03. Landshaping Processes - from plate tectonics to geomorphology; or volcanoes to ice;

04. Environmental - what life, the land and climate were like in the remote past;

05. Historical - the development of geology and its workers;

06. Economic - finding and exploiting mineral resources.

Most panels, field guides and trail leaflets are erudite texts rather than geotourist-friendly introductions. Outdoor panels are usually semi-permanent, generally under-utilised, foci for limited meaningful informational and interpretative exchange; whilst they are essentially visual, some measure of their communicative competence can be gained from an examination of their text.

Exemplary practice from the USA

Within the USA interpretative provision is widespread but not always appropriately focused on the needs of tourists; for example, from Red Canyon Overlook, Colorado which is:

" . . . really two canyons. Most obvious is the broad U-shaped canyon with the tall sandstone walls. But notice the smaller V-shaped cut in the middle of the canyon floor. Water has started to cut into the hard metamorphic bedrock, but this old pressure-treated and tempered rock wears away much more slowly than the fragile sedimentary canyon walls. By the time the small canyon reaches the depth of the larger one, all the sedimentary layers above it will probably be gone."

There is a clear presumption about the geologic knowledge level of tourists. Likewise, from Minnesota's Interstate State Park:

"Eleven hundred million years ago, cracks in the Earth's crust erupted molten basalt lava over huge areas of the Midwest. The cooled lava you are standing on is part of a formation that stretches from Canada to Nebraska. A powerful drill is needed to make even a small hole in basalt. Near the trail ahead are many round holes, called "potholes"... What drilled them? Potholes are formed by swirling water. . . along the trail you will see some of the largest potholes in the world."

Exemplary practice from England

From a general wildlife/topographic panel at one of England's (Wenlock Edge, Shropshire) premier geologic localities:

"The distinctive character of the Edge results from the underlying beds of Wenlock Limestone which dip gently to the south-east. This limestone formed from the accumulation of sediments and fossils in a tropical sea during the Silurian Period of geological time (about 420 million years ago)."

Most tourists do not carry a compass and would be unaware of what the term "beds" means in the geologic context; the text is reminiscent of an erudite guidebook. It would have more readily made sense with the somewhat longer:

"About 420 million a shallow tropical sea covered this part of Britain. In this sun-kissed, clear warm water - much like today's Florida Keys - lived creatures such as corals in very large numbers. When they died, their skeletons, and clay washed into the sea from nearby rivers, built up a thick layer of lime-rich mud on the sea floor. Over many millions of years this mud hardened to form a limestone; this is named, after the area you are standing in, The Wenlock Limestone. Great earth movements eventually pushed up the hardened limestone sea-floor to form a land surface. Other, younger, rocks which once covered it were then washed away by wind, rivers and ice."

Again, from a mid-1990s designed interpretative scheme with several panels at Brown End Quarry (disused), Staffordshire:

" . . . contains an excellent succession of Carboniferous rocks belonging to the Milldale and Hopedale limestones. So good are the exposures that the quarry has been nominated as TYPE-LOCALITY (in part) . . . there has been some uncertainty regarding the age of the exposed sequence, but . . . the British Geological Survey indicates that most of it is likely to be of Chadian age. Furthermore, the lower beds of the Milldale Limestones are among the oldest known rocks to outcrop in the southern Pennine area. Although much is now known about the rocks in the quarry, there are still aspects of the geology of the site which require further investigation. . . what is the significance of the thick limestone band . . . and how was it formed? These and many other unanswered questions serve to highlight the importance of the locality in terms of its research potential."

Readability analyses indicate a reading age of 17+ years. More meaning would have been conveyed to the general tourist by:

"This quarry has some of the best views, used in technical descriptions by geologists, of the same rocks seen in nearby Milldale and Hopedale. They are about 330 million years old - almost the oldest rocks you will see around here. Geologists still do not know everything about these rocks; how and why the thick limestone band, seen here, was formed is still a bit of a mystery! Solving such mysteries makes this a really important place for scientists"; although it still lacks any real interest for the general visitor who would like the questions: "by whom and how was the limestone extracted?", "where and how was it used?" and "what would they have seen had we been standing here 330 million years ago?" answered. The text-rich panels with some line graphics (lacking any scale) reversed out in white from a mid-brown background are similar to the style (gold reversed out of mid-brown) used in the Rocky Mountains National Park, USA (Trapp et al., 1994). A single panel at Barton-on-Sea, Hampshire:

"Forty million years ago, when India was an island off the African coast and North and South America were not joined, a shallow sea existed in roughly the same place as the Channel today. The sediments that collected at the bottom of this sea formed the series of sands and clays now known as the 'Barton Formation",

displays much site-irrelevant detail. Far too many concepts are included in a single sentence, let alone one paragraph, but:

"40 million years ago a shallow, warm tropical sea covered this part of the world. Rivers washed into the sea large amounts of mud from the land. This mud, a mixture of coarse sand and fine clay fell to the bottom of the sea. There it covered the remains of dead creatures such as crocodiles, turtles and seashells;

these are now found as fossils.",

is more approachable and relevant to visitors. At least two panels are needed to split the information into manageable amounts; the information on India and the Americas could better be handled by cartoons. From a single panel at Farndon, Cheshire:

"Try to imagine how Farndon would have looked 245 million years ago. In a hot dry climate an inland sea was developing . . . Into this sea, rivers of sediment were pouring down from the Welsh Clwydian and Pennine Uplands. They . . . form the cliffs we see today. If you walk along . . . you will see thin bands of large round pebbles in the cliffs which represent torrential flood deposits. The cliffs have got their red colour from the rusting of iron within the rock."

The first sentence asks the reader to imagine something beyond their experience; only the last sentence is at the level of a general tourist. Alternatively:

"WHY ARE THESE ROCKS RED? - The rocks are rich in iron. Just like old cars and cans they have gone rusty!

WHY DO THESE ROCKS HAVE CURVED LINES IN THEM? - These rocks were made in water. Each curved line marks a new time when mud and sand were left behind by a large river. Look at the rock face. Can you see that the tops of the curved lines are cut off? This happened when the river changed its course and shape (so the river must moved quite a lot over a very long period of time!).

HOW WERE THE ROCKS MADE? - 245 million years ago this area was as hot and sandy as the Sahara. There was a large inland sea surrounded on two side by high rocky hills. These hills covered what are now the areas around Mold and Manchester. Rivers rushing off these hills carried into the sea a lot of sand and mud. Over a lot of time these hardened. Today it makes up the cliffs you see in front of you. Look carefully at the rock face again. Can you see some layers of pebbles? Just think how much water, moving very fast, it took to bring these pebbles into the area from the high hills (These pebbles tell us that the area was sometimes covered by large, seasonal flash floods - perhaps, after great thunderstorms over the hills).

SWEPT AWAY! - So, if you had been standing here 245 million years ago you would have got very wet and might even have been swept away by vast floods!", is, if oversimplified, more interesting and accessible. From a single panel at Crompton and Brook Bays, Isle of Wight:

". . . These date back over 60 million years to times when the landscape consisted of forested swamps inhabited by dinosaurs, including the Inguanodon, a large herbivore. Footprints of this creature are preserved in the foreshore, but more spectacular are the three-toed blocks where original footprints in the mud were filled with sands which hardened to produce natural rock casts."

Far too many concepts are covered and unfamiliar terms used. Is it the size, origin, or the writer's mindset which makes the blocks "spectacular"?

"These rocks and fossils are 60 million years old. They are the remains of swamps much like today's Florida Everglades. Crocodiles and large plant eating dinosaurs, such as Inguanodon, lived in these swamps. On the beach you can see the prehistoric land surface on which the dinosaurs walked - their footprints, which you can walk next to, are on the flat rocks at the water's edge at low tide. Mud washed into these footprints, during major floods, made casts of them - you can see these at the top of the beach as large, blocks of white stone.",

focuses on the interesting and accessible. Clearly, panel producers seem afraid to write text as it is spoken! Anyone presenting geologic sites should be: *" . . .using words that are often used in speech. These may not be the ones that you are used to writing in formal reports. . . A lot of the more formal bureaucratic words . . . come from the language of the Roman and Norman ruling classes. These words tend to be longer than their short and brutish Anglo Saxon equivalents (like 'buy'). Consider (or 'think about') 'transport' and 'carry', 'observe' and 'see'"* (Cross, 1998, p. 13). On all of these panels the logos of sponsors were very prominent. Their producers assume levels of prior geologic knowledge and understanding consistent with 'A' level and above. Perhaps, the reason for so many poor panels is a combination of this expressed organisational territoriality and the failure to employ appropriately experienced design teams and geologically knowledgeable popularist copywriters. However, there are examples of good practice; from a single panel, shown to be an effective interpretative vehicle (Hose, 1994b) at Hunstanton, Norfolk:

"Look carefully at the cliffs . . . You can see that they are made up of three differently coloured layers of rock . . . They were formed when prehistoric seas covered North Norfolk between 70 and 125 million years ago. White Chalk is a limestone and comes from the bed of a warm, clear tropical sea when Hunstanton had a climate like the Bahamas today . . .".

At nearby Wolferton a panel literally outlines the viewpoint of Neolithic people:

"6000 years ago this would have been the view in front of you. Sea-levels were much higher then and below here would have been a sea cliff, nearly 20 m high and a sandy beach - beyond the sea stretched out as far as the eye could see. This was during the Neolithic or 'New Stone' age, as people were already living in the region, and it is likely that this view was familiar to them. As the climate changed the sea receded into the distance and the modern shoreline is now nearly 2 km distant. Nevertheless the ancient cliff still remains as a curious feature of the local landscape, evidence of the changing face of the planet we live on."

Apart from the last sentence it mainly uses everyday language. Research (Hose, in preparation) found

it had, due to its location, few visitors - most were relatively local and walking their dog or "just taking the air"; hence, its usefulness and cost-effectiveness is questionable.

Exemplary practice from Europe

There is a somewhat mixed, but thoughtful, approach on a text sign at one of Europe's most important geo-historical sites, from which Werner postulated, after his visit in 1787, the neptunist theory:

"The six-sided basalt pillars . . . rest on layers of sand, stand vertically next to each other and people gave them the name 'organ pipes'. . . they were exposed by quarrying. . . As early as 1788 there were geological excursions from Freiburg . . . a scientific dispute arose as to whether basalt was created by deposits of fine particles in water or whether it was a rock created by an outflow from fire. Those of the latter opinion, the vulcanists, finally proved that basalt is an extrusive rock. The mighty basalt block . . . was, therefore, once a glowing hot stream of lava, which buried thick layers of sand under itself and solidified them into columns. Erosion and uplift later gave rise to today's surface."

At the same site (Scheibenberg, Germany) is a more complex roofed display panel; it covers far too many points and really misses the site's great human interest:

*"The basalt rock is of volcanic origin and rests on gravels and sands which came from an ancient river, which before the uplift of the Erzegebirge filled a broad, flat valley - into which subsequently, in the Tertiary period, masses of lava flowed. The place where these erupted has not been ascertained - often it has been taken to be the area of the Fichtelberg. Out of the cooled and solidified lava were formed about 24 million years ago the basalt pillars, which on the northern side have a thickness of almost 3 metres and a height of 30 to 40 metres. As the six-sided columns are resting only on sand, they are called 'rootless'. The exposures of the 'Organ Pipes' as they are popularly called took place through quarrying. . .",*as the place which fuelled over one-hundred years of intense polarised scientific argument which revealed the humanity and fallibility of real people who just happened to be scientists. For, of course:" . . *an adequate knowledge of the history and development of the subject, as well as information on the life and works of the people who contributed to such developments, are absolutely essential for the proper understanding of the subject."* (Maempel,1989, p. 19) highlights the need to include human interest within geologic interpretative provision. Also from eastern Germany, a text-only trailside sign, describes the:

"Great Limestone Quarry (Natural monument - thrust fault)Kossmat (a geologist from Saxony) proved in 1915 that the limestone and the surrounding crystalline rocks (mica schists) were folded and metamorphosed at high temperatures and pressures. The metamorphism greatly altered the original rocks (deep sea sediments). The limestone . . . is crystalline, very dense, solid and in parts mixed with mica. Limestone from Hammerunterwiessenthal can be compared chemically with the limestone in Thuringia and also the Island of Rugen, but it is however, considerably older."

It has much irrelevant detail, lacks any sense of drama and an indication of the site's rich and interesting structure and minerals. From a graphically bold panel in a redundant quarry on the flanks of an extinct volcano (Auvergne, France):

"The Puy de Dome consists of two structures side by side. Its formation can be compared to that of Mount Pelee (Martinique) where two successive domes were formed in 1902 and 1929. The growth of a dome corresponds to the slow outpouring of viscous lava which accumulates on the spot. It is accompanied by violent explosive phenomena which create burning avalanches. The formation visible in this quarry was deposited by one of these avalanches.".

It employs upper case lettering throughout, has an example unfamiliar to the non-geologist and uses technical language ("viscous" for "treacle-like consistency"). From another full-colour panel in the Auvergne, France:

"Lake Pavin, a volcano of the Maar type, results from a highly explosive "phreatomagmatic" activity caused by the underground meeting of water (surface or infiltration) and ascending magma. Its circular crater (900 to 1000 metres in diameter) is occupied by a lake (750 metres in diameter, 93 metres deep). The eruptive deposits, 15 metres thick in the vicinity of the crater, extend over an elliptical area of 15× 6 square kilometres. The Pavin Maar, 5,800 years old, is the youngest volcano in France!!!"

It makes some very interesting points in a somewhat dull manner! A better approach is:

"When hot liquid rock punched to the surface - which must have been seen and heard by Stone Age people living nearby - it met rainwater sinking through the ground and a steam-powered explosion happened; this blew out a wide, shallow crater and made lots of small rock pebbles with bubbles in them".

Closing thoughts

Pan-European considerations

Geotourism provision is far too fragmentary and lacks a coherent "house style". Due to a mismatch between its information base and that of tourists, it has limited communicative success. This is despite readily available UK and USA publications indicat-

ing best practice for geologic and countryside management and interpretative provision. A coherent pan-European geologic heritage conservation and interpretative provision strategy is needed before many more sites are lost in the rush to rehabilitate old industrial and extractive industry landscapes. To fire tourists' imagination it should promote self-explanatory themes such as "mountains of fire", "death of an ocean", "mountain roots", "sea monsters", "mammoths and ice" and, of course, "dinosaurs". It should also employ common graphical elements in publications, outdoor panels and signage.

Recognising and developing Geotourism destinations

Several areas of southern Europe offer immediate geotourism development opportunities. Corsica, the Costa Blanca, Cyprus, Gibraltar, Mallorca, Malta, Sardinia and Sicily contain sufficiently interesting geologic phenomena, structures, minerals and fossils to already commend themselves to organised field parties because of their climate and abundance of rock types not generally found in northern Europe. Likewise, areas of central and eastern Europe, well known for their fine fossils and minerals, are opening up to geotourism: the Erzegebirge and Bohemia have began to be visited by UK-based adult-education field parties. Again, regions such as the Auvergne and the Eifel continue to be popular with such groups. The production of low-level interpretative geologic material, appropriate to tourists, can be readily accomplished from existing published sources. Initially, new promotion could centre on updating and translating popular specialist British (Geologists' Association), French (Masson's Guides Geologiques Regionaux) and German (Gebruder Borntrager's Sammlung Geologisher Fuhrer) language field-guides. The publication of leaflets with a brief description of some readily-accessible sites would be of assistance in opening up the geotourism market; operators of coach-based excursion tours could be encouraged to distribute such leaflets and to include visits to the sites as part of their 'natural wonders' excursions.

A phased approach

A phased approach to geotourism provision might best involve the preparation and production of the following:

a. guide leaflets for popular coastal tourist areas;

b. scenic postcards reprinted with geologic information;

c. concise geologic guide booklets.

Further, the provision of:

a. on-site infomational/interpretative panels;

b. waymarked geology trails for walkers and motorists;

c. new exposures and spoil-tip material for collecting;

d. new museum/heritage centre located display(s)

are essential to effectively and interestingly promoting geology to general tourists. An efficient means of swiftly developing on-site geologic interpretative provision, is the production of general informational geology panels - usable at a range of sites - supplemented with site-specific panels. All such panels should conform to an agreed colour and typographic layout; the use of electronic templates, imaging and printing systems should be fully exploited in their preparation. The production of relatively inexpensive temporary and semi-permanent outdoor interpretative panels employing simple laminating systems should be also developed.

Chartering the popularists?

Geologists must acquire the skills necessary to better promote their discipline in a manner interesting and meaningful to tourists; we, yet again, stand: "*. . . at a period of transition which offers us the opportunity to change our approach in presenting ourselves to the public. Our professional societies should seriously appraise our public image, think about what should be done to improve it, and get busy*" (Baird, 1968, p. 230). The role of the scholarly popularist must be accorded appropriate recognition within the profession, for:

"*Finally, what is needed is the development of partnerships between earth scientists and those involved in interpretation in order to develop interpretative projects.*" (Badman,1994, p. 432).

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