



NEWSLETTER NO. 112 AUGUST 1995

The Black Country Geological Society

The Society does not provide personal accident cover for members or visitors on field trips. You are strongly advised to take out your own personal accident insurance to the level you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

Leaders provide their services on a purely voluntary basis and may not be professionally qualified in this capacity.

The Society does not provide hard hats for use of members or visitors at field meetings. It is your responsibility to provide your own hard hat and other safety equipment (such as safety boots and goggles/glasses) and to use it when you feel it is necessary or when a site owner makes it a condition of entry.

Hammering is seldom necessary. It is the responsibility of the hammerer to ensure that other people are at a safe distance before doing so.

FUTURE PROGRAMME

Lecture meetings are held in the Banquet Room (Dudley Suite) at the Ward Arms Hotel, Birmingham Road, Dudley. Phone: (01384) 458070. 7.30 p.m. for 8 o'clock start.

SUNDAY 24th SEPTEMBER. Field meeting to Lathkill Dale and Stoney Middleton, Derbyshire. Leader: Dr. Cynthia Burek (Open University).

Meet at 10.30 a.m. at Shining Bank Quarry (grid ref:232648) about 5 miles south-east of Bakewell. Travel up the A6 road through Matlock, then through Rowsley; about 1 mile after Rowsley turn left along the B5056. Go along the B5056 for about 3/4 mile, then just before the bridge over the Lathkill River there is a track to the right leading to the quarry entrance. (See map with this newsletter).

This field meeting will look at the Quaternary of north Derbyshire and in particular the history of glaciation in the area, studying glacial till and wind-blown loess deposits and looking at landforms caused by glacial action. The first venue, Shining Bank Quarry (entrance at 232648), has the best exposed lodgment till in the region, with Lake District erratics and striated bedrock. In Conkesbury Quarry (211651), worked for barytes, the till is absent but there is a deposit of loess.

Lunch will be taken in Bakewell (or bring sandwiches).

Chairman
A. Cutler B.Sc., M.C.A.M.,
Dip.M., M.C.I.M.
Vice Chairman
G. J. Worton B.Sc., F.G.S.,
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Hon. Secretary
P.D. Shilston M.A., C.Eng.,
F.I.E.E., M.I. Mech.E.

Field meeting 24th September (continued).

After lunch we will visit Hassop Col viewpoint (243735) to consider the influence of local topography on ice movement, then to Darlton Quarry (217758) where a till infills a former tributary valley of Middleton Dale, now hanging above it. Finally to Bee Low Quarry (090791) to assess the effects of glacial erosion on the upland landscape.

DR.CYNTHIA BUREK is with the Open University. She studied the subject of this field meeting for her PhD thesis.

This is a joint field meeting organised by Manchester Geological Association.

MONDAY 9th OCTOBER. Lecture: "The geology of the solar system" By Dr.Bob Owens (National Museum of Wales).

In recent years the study of geology has moved out into the Solar System, and new discoveries are regularly being made. This lecture will give a survey of the latest knowledge in this area and will concentrate on the Moon and the inner planets where there is now a great deal of information about their landforms and geology. They have all been mapped, there are many pictures available, and a large amount of scientific data has been collected by the many probes that have visited them. Much is now known about their present state and their history. If time permits, Dr.Owens may go on to describe something of the outer planets.

Dr.BOB OWENS is a palaeontologist by profession working at the National Museum of Wales in Cardiff. His interest in solar system geology is subsidiary to his main activity, but he is now a considerable authority in this exciting field.

MONDAY 30th OCTOBER. Lecture: "Geology in the Canaries - sun, sand and volcanoes"
By Dr.John Stanley (Keele University).

Dr.Stanley writes: "The Canaries are better known for sunshine than for geology but as youthful volcanic islands they offer geology not available in the UK, are very accessible, cheap and more diverse than might be expected. An active volcanic region, the islands were formed when our own last major geological events were on the wane.

I will give a general background introduction to oceanic islands, and specifically the Canaries, and then home in on Lanzarote, Tenerife and Gran Canaria."

DR.STANLEY is Associate Director of Adult Education at Keele University. He graduated at Keele, went to Nottingham for his PhD on Silurian Brachiopods (including many from Wrens Nest I) and finally returned to Keele as the first scientist in the (new) Extramural department where he has been for the last 30 years. He became involved in Canary Island geology in 1988 when the first study tour from Keele was arranged.

MONDAY 27th NOVEMBER. Lecture: "Thrust tectonics and piggyback basins in the western Spanish Pyrenees". By Dr.Jonathan Turner (Birmingham University)

MONDAY 15th JANUARY 1996. Lecture: "The great dyke of Zimbabwe"
By Dr.J.I.Langford (Birmingham University)

MONDAY 19th FEBRUARY. 7.45pm Annual General Meeting followed at 8pm by a lecture by Graham Hickman (society member/British Petroleum).

MONDAY 18th MARCH. Lecture by Dr. Ken Addison (Wolverhampton University/St. Peters College Oxford).

THURSDAY (note THURSDAY) 27th APRIL. Lecture: "Monitoring active volcanoes: procedures and prospects." By Dr. W. McGuire (Centre for Volcanic Research Cheltenham & Dept of Geological Sciences UCL).

EDITORIAL

There is no problem in finding a topic for an editorial this month. I have just returned from a trip to the Cuillins of Skye. It was from a love of mountains that my interest in Geology sprang.

Arriving at Glen Brittle at evening, the lure of the mountains was such that I was drawn upwards to the great arc of dentition and drew close to the awful massive rock faces which demanded an emotional and religious sponse.

Later I climbed into corrie Lagan. The enormous rock lip below the corrie lake was comparable in size only to those I had seen in close contact with the ice among the largest mountains of the Swiss and Italian Alps.

Scrambling over the blocks of gabbro renewed the pleasure of using hand and boot but the gabbro clings to one's boots like velcro and one felt able to climb rock surfaces like a fly on a wall.

Corrie Lagan is an enclosed and secret place where huge screes descend from the jagged peaks of Sgurr Alasdair. A helm wind blew into the corrie and produced moving patterns on the loch.

Glaciation has completely reduced the Cuillin Ridge to a knife edge of aretes and gendarmes of terrifying steepness unlike anything elsewhere in the British Isles.

Lastly, by boat, I sailed into the heart of the Cuillins on a day when everything sparkled. The cleavage planes of crystals of augite shone like diamonds and rivers and water on rock faces reflected like cut glass.

REPORTS

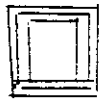
The origin and use of semi-precious stones by Barry Taylor. Monday 15th May.

"Diamonds" - so says the song - "are a girl's best friend" and it's probably true if all you want is a bit of glitter and a lot of money. However, this was not the message we had from Mr. BARRY TAYLOR - no indeed. If you prefer a more subtle beauty, an almost endless variety of markings and colour and even a touch of the mystic then go for SEMI-PRECIOUS STONES.

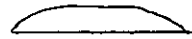
Mr. Taylor has made a hobby of collecting and polishing semi-precious stones, a hobby which has absorbed him for twenty years. Over this time he has obviously learned a great deal about rocks and minerals but he says he is not a 'real' geologist.

We were first given an explanation of the main difference between a semi-precious and a true gemstone. This difference, said Mr. Taylor, lies in the hardness of the stone. The degrees of hardness are given by MOHS scale, which starts at 1 with soft Talc and goes through GYPSUM 2; CALCITE

3; FLUORITE 4; APATITE 5; ORTHOCLASE 6; QUARTZ 7; TOPAZ 8; CORUNDUM 9 and finally hard diamond at 10. The true gemstones, i.e. DIAMOND, RUBY, SAPPHIRE and EMERALD all have hardness greater than 7.5 and possess no strong cleavage so they can be faceted, that is, cut to reveal many light-catching faces.



FACET
CUT



CABOCHON
CUT

The softer and more colourful semi-precious stones are usually rounded or CABOCHON cut, since they do not depend on the refraction of light to give them their beauty. It is possible to facet-cut some of the harder stones such as garnet and tourmaline.

Shaped and polished stones are very popular for decorative wear and larger pieces make unusual and interesting ornaments. Certain stones are associated with birthdays and it is said to bring luck to wear the appropriate stone. So those born in January should wear garnet; February, amethyst; March, jasper; April, sapphire; May, chalcedony; June, moonstone; July, ruby; August, peridot; September, chrysolite; October, opal; November, topaz; December, turquoise.

Mr. Taylor next mentioned the place that semi-precious stones have in folklore, especially the QUARTZ gems which are popular for crystal healing. Opal, which is a non-crystalline form of quartz, has had a mixed history; at one time it was very popular but, for some reason, came to be considered unlucky and its popularity fell.

Although most semi-precious stones are attractive by nature, it is possible to enhance their appearance by treatment with oil, or by irradiation e.g. smoky quartz, or by dyeing e.g. 'turquoise' from albite.

We learned that the search for semi-precious stones dates back at least as far as ancient Egypt. Today, in South Africa, people wade, waist deep 'panning' with wicker baskets for perhaps the one good stone that could provide a year's living.

Tourmaline had a special mention; it was used a lot in Victorian times as 'mourning jewelry' when other forms of adornment were frowned upon.

Besides collecting stones Mr. Taylor has photographed many of them and we were treated to a slide show of some of his prize specimens.

Among these was RHODONITE, a lovely red manganese-silicate, often found with iron. A more unusual stone was UVAROVITE, a type of garnet which is green because of its association with chromium ores. Another garnet was GROSSULARITE, normally colourless, but this specimen had iron as an impurity and was a lovely warm brown colour, well named cinnamon stone.

There followed a rainbow display, including an amethyst geode, an example of yellow CITRINE, beautifully banded AGATE, a thin section of MOSS AGATE -

but mere words do not do justice to the range of colours from brilliant to subtle or to the banding and mottling that is the fascination of semi-precious stones.

Mr. Taylor had brought with him a selection of 'hands-on' specimens many of which had a most attractive 'feel'. Some samples were for sale and I came away from Mr. Taylor's excellent talk poorer in pocket but richer in appreciation of the beauty and interest of semi-precious stones.

BARBARA S. RUSSELL

Evening field meeting - Lickey Hills - Part 1. Monday 12th June 1995.

This was the first of a pair of field meetings in the June sunshine to see the best parts of the Lickey Hills - from a geological point of view. The Lickeys are not far from the centre of Birmingham but they show quite a wide range of geological features and are well worth a visit.

This "Lickey Hills part 1" meeting covered the southern part of the area. Starting at the Visitor Centre (GR: 998754) where we studied their 3-dimensional geological model of the Lickeys, we next looked at the nearby quarry in Lickey quartzite. The Lickey quartzite ridge is an anticline and the quarry showed the steep dip of its western side, while the lookout on the top of the ridge showed the flat Triassic marls and clays of the country to the east.

Then down off the ridge to the junction with the Keele Clay (Carboniferous) where the Visitor Centre stands, and then down and across the main road to the ornamental ponds (995756) above the Rose & Crown, still on Keele clay which could be seen in occasional exposures in the bank side. Nearby a retaining wall of local sandstone showed where they had borrowed a few pieces of gravestone to make up the quantity, with bits of Italian marble (with lettering!) showing here and there amongst it.

The Lickey Gorge showed up well in cross-section at this point, indicating that this must have been a glacial overflow channel because the existing small stream could not have cut such a deep gorge. Following along the Barnt Green Road we saw two valleys on the eastern side of the Lickey Ridge which were probably the beginnings of glacial overflow channels; it is thought that when the main Lickey Gorge was cut down these other channels then lost their flow and were never fully developed.

The final locality was the 'overfold quarry' (001753) on the eastern side of the anticline, which shows a good exposure of Lickey Quartzite as well as some faulting and an overfold in a section of the quartzite strata. At this point Dr. John Powell of the British Geological Survey, who had come to the field meeting, pointed out that the Lickey Quartzite was now classed as Ordovician, not Cambrian as previously believed; this disappointed some members as our chief - perhaps only - Cambrian exposure in the area had now gone!

Evening field meeting - Lickey Hills - Part 2. Monday 26th June 1995.

Following on from the "Lickey Hills part 1" field meeting this second meeting covered the northern section of the Lickey Hills and went as far as the unconformity in Rubery.

The starting point at Beacon Hill car park (986759) stands on Clent Breccia and shows one of the few local exposures although it is only the car park surface. Clent Breccia is Permian and is made up of angular fragments of Barnt Green volcanics (now dated as Ordovician) or similar. It was a flash flood deposit laid down in a desert climate by short-lived torrential storms carrying scree material from adjacent mountains.

Beacon Hill is also a very good viewpoint with spectacular views of:-

- Malvern Hills (Pre-cambrian)
- Waseley Hill (Clent Breccia at top, Keele Clay on lower slopes)
- Clent Hills (Clent Breccia, Permian)
- Frankley Beeches (on a patch of Clent Breccia)
- Rednal Hill (Lickey Quartzite, Ordovician)
- Turner's Hill (Dolerite)
- Barr Beacon (Hopwas Breccia and Triassic sandstone)
- Birmingham City (Triassic sandstone and clay)

Descending the scarp face, Clent Breccia gave way to Keele Clay (Carboniferous) which forms the valley floor of the golf course. There were many exposures of Keele Clay in bank sides and drainage ditches, and it was noteworthy that we were now crossing the main watershed of Britain, with rainfall to the left running into the North Sea and to the right into the River Severn. Continuing on we reached the lower slopes of the Lickey Quartzite ridge (995764), called here 'Rednall Hill', where there were many fragments and blocks of the quartzite, which is a *sedimentary quartzite* as distinct from the more common *metamorphic quartzites*.

Near this point there were several damp patches or springs, formed at the junction between the Lickey Quartzite above and the impervious Keele Clay below. The party then walked to Rubery (992774) to see the Rubery Sandstone (Llandoveryan, Silurian) at the most easterly exposure of the Silurian in England (*reportedly missed by Murchison*). The strata dip slightly to the east, and to the west of the exposure there is the well-known unconformity between Rubery Sandstone above and the Lickey Quartzite (Ordovician) below. At this point the junction is close to pavement level but it is irregular and soon rises to some 6 or more metres above. Returning along Leach Green Lane there were several exposures of the junction at a high level in the old quarry face, though where the quarry ends the junction is again down at ground level. Further south the quartzite disappears below ground and from then on only the Rubery Sandstone is seen.

The final points of interest in the meeting were just above the golf clubhouse (995758) where there were signs of a resistant sandstone band in the Keele Clay, indicated by a change of slope at this point and one or two sandstone boulders in the path. Further up the hill, on looking back, there was a good view of the Lickey Gorge showing how deeply it had been cut into the very hard material of the quartzite. It is interesting that the Roman Road from Droitwich (*its Roman name SALINAE, meaning 'salt springs'*, gives a geological link with the Triassic evaporite salt deposits underlying the town) through Bromsgrove to Birmingham is lined up to pass through the Lickey Gorge so the Romans must have been glad to make use of this feature.

So now we were back at the car park after an interesting couple of hours, running in geological time from the Pre-cambrian to Ice Age glaciation, at a locality only some 8 miles from Birmingham City centre.

PAUL SHILSTON

Lecture: "Alaska and The Yukon - Glaciers and Gold" by Paul Shilston.
Monday 19th June.

Alaska and The Yukon! The very names conjure up heroic images of great adventure and history, and the landscape with its broad vistas and rugged scenery matches this image. This lecture derived from a 3 week visit to Alaska and The Yukon in 1993 and concentrated on two main geological themes - the impressive glacial scenery in Alaska left after the end of the Ice Age and the Gold Rush to the Klondike area of the Yukon in 1897-8.

Alaska is a country of great distances and wide open spaces and it seems as if the Ice Age has only just finished (or perhaps it is still with us). The ice has only recently departed and as vegetation is very slow to grow in this cold climate, much of the area is still virtual desert and glacial features are everywhere to be seen. In particular the large scale of the Alaskan landscape means that glacial features are on an impressive scale, much greater than anything seen, for instance, in the Alps.

Most impressive are the great glaciers flowing down from extensive snow plateaux into the valleys, though from evidence on the valley sides of moraine deposits and sparse vegetation it is clear the glaciers are now only a fragment of their original size. Slides illustrating the lecture showed the inland Byron and Worthington glaciers, as well as the spectacular Columbia glacier which can only be approached by boat and which calves icebergs into the sea. Other features described in the lecture showed what was left after the ice had gone, including areas of muskeg (poorly drained soil above permafrost giving a peat-type covering) and impressive river bluffs caused by uplift of the land, which enabled rivers to cut down deeply into the relatively soft glacial till deposits.

Finally we saw the Alaskan oil pipeline which carries oil from Jurassic shales around Prudhoe Bay to the port of Valdez for onward shipment by tankers. Where the environment is fragile the pipeline runs above ground so as not to disturb the permafrost, otherwise it is buried to allow free travel to the area's wildlife.

The second part of the lecture - the Gold Rush - followed the miners trail from Skagway over the coastal watershed and down the Yukon River to Dawson.

The incredible photographs taken at the time in the winter of 1897-8 showed the unbelievable hardships the miners had to face carrying their goods up to the summit of the Chilkoot Pass. Then they built boats and drifted down the Yukon River, through several sets of rapids until the lucky ones reached Dawson City. Initially gold was found as placer deposits in the rivers, then as these were exhausted 'fossil placers' were found high up the valley sides, formed at earlier times when the rivers ran at those higher levels.

Finally we saw how gold could be separated from river gravels and other deposits, on account of its high density, by panning or by the natural action of rivers. Gold is extremely heavy with a density of 19 while typical gravels are around 2 - 4, so by shaking a mixture of gold particles and gravels the gold will always sink to the bottom. Although serious gold extraction has now ceased in the area there are still a few individuals who come up each summer to try their luck, often working gravels that have already been worked several times before - hoping to strike it rich!

PAUL SHILSTON

THE CONSERVATION COLUMN

Limestone Pavements are still under threat from demands for rockery stone. It is being illegally extracted commercially despite its protected status under national and international law. In Cumbria, Yorkshire, Lancashire and Wales 2,500 hectares remain but only 3% is undamaged. Laid bare by glaciers it has been weathered into strange patterns and provides a habitat for communities of very rare plants and butterflies.

Eric Robinson, Vice president of the Geologists' Association, writes that these pavements are *irreplaceable*. The glacial processes that created them are not now operating.

Geologists are working with conservationists and urging the listing and recording of sites and asking that they be included in local plans. Limestone Pavements have their own legislation, Limestone Pavement Orders, within the 1981 Wildlife and Countryside Act, to restrain Quarrying and Development. However, both legal and illegal Quarrying is continuing and increased protection in Britain is putting extra stress for exploitation in Ireland.

The Royal Horticultural Society has a policy to encourage its members not to use pavement stone and to ban its use in exhibits. Individuals, landscapers gardeners and planners must be made more aware of the damage its use does to the environment.

--- ADVANCE NOTICE ---

BRITISH ASSOCIATION ANNUAL FESTIVAL 1996

The Annual festival of the British Association for the Advancement of Science (BAAS) next year - 1996 - will be held in Birmingham. The dates are Saturday 7th - Friday 13th September 1996. The BCGS and the Geologists Association will be helping with the arrangements - WATCH THIS SPACE !

NEWS IN BRIEF

1. Welcome to new members

Stanley and Beryl Budd from Sutton Coldfield.

2. Southampton Mineral Fair will take place on Saturday 9th September at the Avenue Hall, The Avenue. An Exhibition from Oxford Museum will be included. Sales and displays of Minerals and Fossils, gemstones and Jewellery, Geological Books, Microscopes and Tools, and Crystals will be on view.

STOP PRESS

1. Alan Cutler and Graham Worton have recently returned from an important London meeting of the Geological Curators Group. The curators were questioning whether site conservation should be part of their work. Alan and Graham put forth their argument that without their being engaged in site conservation there will be no specimens and collections to curate.
2. I have just heard Graham Worton talking on Radio W.M., about the fact that Geology lies all around us. He advertised the Society's 'walk and talk' activities stressing that they cater for all who are interested. I thought he pitched what he said just right for the programme. (Think I might join!). Ed.

Editor

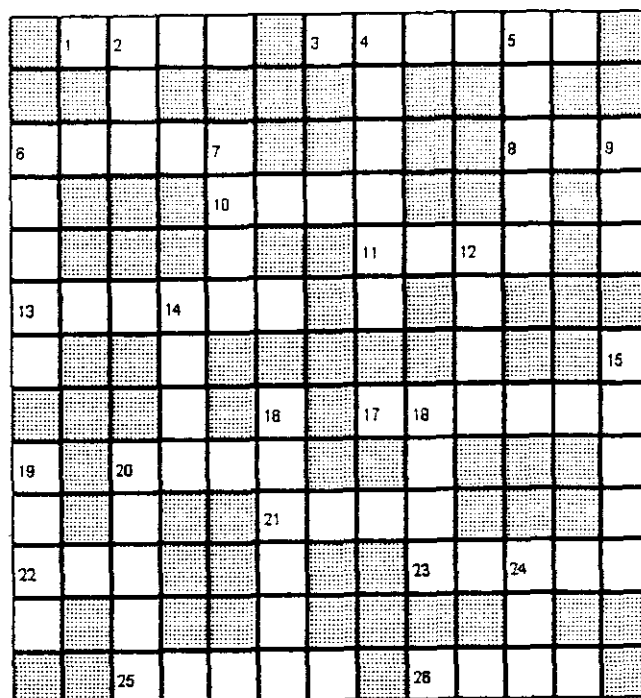
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CLUES - SLIGHTLY CRYPTIC

ACROSS

1. Geological rave! (4)
3. Sharp, but shavers beware! (6)
6. Aide de memoire (anag.) (5)
8. Airless valley (3)
10. Painful exclamation- if still hot (2,2)
11. Playing the safe way at the track (4)
13. Will it wear out a maiden's hair? (6)
17. Stupid metal! (6)
20. Largest female name - in the east! (3)
21. Hard luck! (4)
22. Creamy rap singer (3)
23. Check it - they pay no attention - song (5)
25. Sleepily collect crumbs in France. (5)
26. Old female - depends on dark male's name (4)

DOWN

2. Lose 'consumption'- no work, clear skin (3)
4. French Geological raves? (6)
5. Musically - ____ Wind and Fire'. (5)
6. Reversed cares eventually melt. (5)
7. Can be used to boil eggs - inedible though (4)
9. It has many grey colours, has this! (3)
12. Dyslexic cockney Eliza often started/ startled with this! (4)
14. Unpopular in World War Two. (4)
15. Last time here on the 25th - 1981 (5)
16. You may not find it in the mist. (4 2)
18. E.g. Chas and Di, on safari! (4)
19. Long and narrow 7 down. (4)
20. You're next! You can't spell! (1,4)
24. Accelerate a gram of this in the desert if you're not tired! (3)

QUICK CLUES

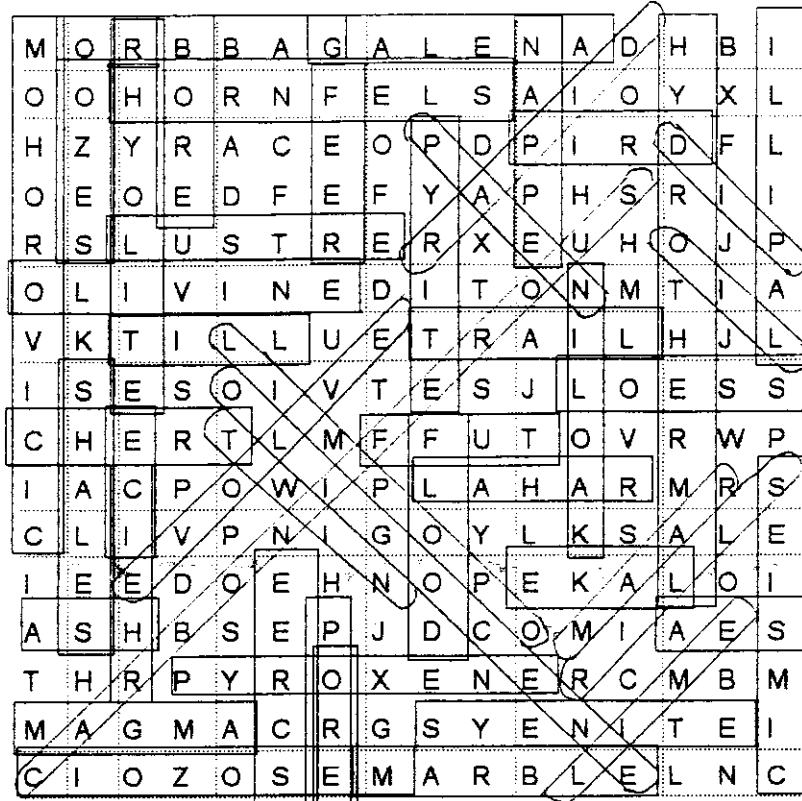
ACROSS

1. Sweet names right through the middle. (4)
3. Knife- edged in the mountains. (6)
6. After the flood mucks, -- and sands. (5)
8. Long narrow and flooded -- not a fiord! (3)
10. Hard when cold - try walking on it - and spelling it! (2,2)
11. Ache (anag.) (4)
13. Mechanically wear and tear. (6)
17. Thick and short - politician? (6)
20. Largest continent. (4)
21. Volcanic product. (4)
22. H₂O at 0°C. (3)
23. Plant them everywhere - they may keep us cool! (5)
25. Strata when overfolded and moved sideways. (5)
26. Can be found along Pennine Way - not real sponges! (4)

DOWN

2. Wars and economies hinge on this! (3)
4. Smooth, streamlined glaciated mountain features - moutonnées (6)
5. If you aren't on it where on earth are you? (5)
6. A feature of steep glaciers. (5)
7. It's amazing where it gets - on the beach! (4)
9. You had plenty after your bonfire. (3)
12. Likely to be solid and liquid but not in an apple!. (4)
14. The earth spins around this. (4)
15. Skiers need them, glaciers feed on them. (5)
16. Keep to the straight and narrow if possible. (4,2)
18. Largest valley on earth. (4)
19. 7 Down in long narrow ridges. (4)
20. E.g. Roseate, Arctic; beautiful fliers! (1, 4)
24. Unit of energy in the desert, on the surface (3)

ANSWERS TO THE WORDSEARCH



Ash
 Bore
 Carboniferous
 Chert
 Dip
 Drip
 Evolve
 Flood
 Gabbro
 Galena
 Hornfels
 Hydrothermal
 Ice
 Kaolin
 Lahar
 Lake
 Lapilli
 Lime
 Limpopo

Loess
 Lustre
 Maar
 Magma
 Marble
 Mesozoic
 Mohorovicic
 Nappe
 Neap
 Oil
 Oligocene
 Olivine
 Ooze
 Ore
 Pore
 Pyrite
 Pyroxene
 Rapid
 Reef

Rhyolite
 Rill
 Scree
 Sea
 Seismic
 Shale
 Syenite
 Till
 Trail
 Tuff
 Twin

Other words

Fen
 Horn
 Race
 Rip
 Soil
 Tide