NEWSLETTER NO. 104
APRIL 1994

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 to use it when you feel it is necessary or when a site owner makes it a condition of entry.

FUTURE PROGRAMME

Lecture meetings are held in the Banquet Room (Dudley Suite) at the Ward Arms Hotel, Birmingham Road, Dudley. Phone: (0384) 458070. 7.30 p.m. for 8 o'clock start.

MONDAY 18TH APRIL. Lecture "Groundwater supplies in the Severn Trent catchment" by R.I. Rodgers (Groundwater Planner, Severn Trent Water).

Severn Trent Water's catchment covers a large part of central England and much of its area depends on groundwater for its public water supply, involving boreholes in the various aquifers. Location and maintenance of these supplies depends largely on geological expertise provided by Severn Trent's own staff and this lecture will describe their activities in providing groundwater supplies in various parts of their area.

Mr. Rodgers is a hydrogeologist, working with Severn Trent Water as Groundwater Planner in their Planning and Resources Department in Birmingham.

THURSDAY 21 APRIL. Lecture: "Geological fieldwork in the Antarctic - a personal perspective" by Dr. Debbie Armstrong of the British Antarctic Survey.

This lecture will cover the work of the British Antarctic Survey, what it is like to live in Antarctica and also the minerals found there.

WEDNESDAY 27TH APRIL. Afternoon visit to salt mine at Winsford, Cheshire. This is Britain's only dry salt mine.

This is now fully booked.

SATURDAY 7TH MAY. ROCK & MINERAL FAIR 10.00 a.m. - 4.30 p.m. at Keele University Students Union. Rocks - Minerals - Fossils - Lapidary. Admission 50p (children free when accompanied by an adult).

SUNDAY 8TH MAY. Field meeting to Mam Tor landslip, Castleton, Derbyshire and related sites.
Leaders: Dr. J. Cripps and Dr. P.R. Ineson (Sheffield University).

Meet at 10.45 a.m. where the former A625 road from Castleton towards Mam Tor is stopped because of the landslip (grid ref: 135834). There are several ways to Castleton but a suggested route is: M6 motorway to junction 14, A34 to Stone, A520 to Leek, A53 to Buxton, A6 towards Chapel-en-le-Frith but turn right to Sparrowpit, then down Winnatts Pass. Before Castleton turn left onto the old A625 for the meeting point.

MAM TOR is composed of a series of sandstones and shales (Mam Tor beds and Edale shales) between the Carboniferous Limestone and Millstone Grit (Upper Carboniferous) horizons. Due to chemical weathering and groundwater action its face is unstable and below the face there is a trail of landslip debris over 0.5 mile long. The landslip started at least 2000 years ago and is still active today. Repeated attempts have been made to maintain the A625 Manchester-Sheffield road which passes over the landslip tail but the unstable ground made this difficult and eventually in 1979 the road was abandoned.

Dr. Cripps will explain the features of the landslip from the Mam Tor face to the tail and in time from the Ice Age to the present day. It is also planned to visit other sites in the area.

SUNDAY 12TH JUNE. Field meeting to the Forest of Dean. Leader: Roger Vaughan (Bristol City Museum).

Meet 11.00 a.m. at the entrance to Edgehills Sand Quarry (grid ref. 659169). This is on the A4136 road, about one mile south of Mitcheldean, at the top of Plump Hill opposite the entrance to the Wilderness Field Centre.

The Forest of Dean is an outstanding geological area with Devonian and Carboniferous strata and Roger Vaughan has planned an itinerary visiting a number of quarries showing good exposures of them.

ROGER VAUGHAN is a geological conservator with Bristol City Museum. He mapped the Wigpool syncline as part of a student project in 1984 and has taken many parties to the area. A few years ago he lectured to the Society on the excavation of the dinosaur found in Snowshill Quarry in Gloucestershire.

HARD HATS ARE REQUIRED FOR THIS FIELD MEETING - members must provide their own.

MONDAY 20TH JUNE. Lecture: "Australian Journey" by Paul Shilston.

PAUL SHILSTON writes:"This talk is based on a recent six week visit to Australia and will describe some of the geological highlights we saw. There is a wealth of geological interest in Australia and this talk will only give a few snapshot views.

Ayers Rock definitely is a ROCK and therefore involves geology, but the talk will also include gold mining in Ballarat, volcanic features at

the Glasshouse Mountains near Brisbane and the Atherton Tableland near Cairns, the Great Barrier Reef, the Arnhem Land escarpment and features of the Red Centre including the Olga Mountains, Kings Canyon and of course Ayers Rock."

SUNDAY 3RD JULY. Field Meeting to Derbyshire with a lead-mining theme. Leader: Lynn Willies (Peak District Mining Museum).
(Joint meeting with Manchester Geological Association and with North Staffs Group of the Geologists Association).

Meet 10.30 a.m. at Magpie Mine, Sheldon near Bakewell (grid Ref: 173682). The morning will be at Magpie Mine, an old lead mine where there are substantial surface remains. These include the engine, winding and boiler houses and other buildings which have been preserved as a historical monument of the lead mining industry. The mine was worked for at least 170 years (finally closing in 1959) and Lynn Willies will describe the site and its history, probably including a visit to Magpie Sough (the mine drainage outlet).

The afternoon will start at 2.00 p.m. at the Peak District Mining Museum in Matlock Bath (grid ref: 294581) where Lynn Willies will give a guided tour of the Museum displays on the history and development of mining in the area, including typical minerals. This will be followed by a visit to the nearby Temple Flourspar Mine which is owned by the Peak District Mining Historical Society and has a section open to visiting parties.

There is a charge of around £2 per person for entrance to the Museum and Temple Mine but a drink of Matlock spring water can be obtained free!

LYN WILLIES is heavily involved with the Mining Museum and with the Peak District Mining Historical Society. He has a great knowledge of Derbyshire lead mining and played a major part in the preservation of the Magpie Mine surface works.

HARD HATS ARE REQUIRED FOR THIS FIELD MEETING - members must provide their own.

FRIDAY 22ND - SUNDAY 24TH JULY. Weekend field meeting based at Chester. Saturday - Clwyd mountains (limestone) led by BGS members. Sunday - Traverse of the Wirral led by David Thompson, Keele Univeristy. More details will follow in the next newsletter.

5TH - 9TH SEPTEMBER. BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. 1994 ANNUAL CONFERENCE - LOUGHBOROUGH.

SATURDAY/SUNDAY 24/25TH SEPTEMBER 1994. 10 a.m. - 5 p.m. each day.
DUDLEY ROCK & FOSSIL FAIR - Town Hall & Museum, Dudley.

As for the Rock & Fossil Fair in 1992, the Society has been asked to provide voluntary help as cashiers, guides, programme sellers etc. Last time about 40 members gave assistance for a whole or half-day and this was much appreciated by the organisers.

This year additional help will be needed as there will be stands in the Museum as well as in the Town Hall with entrance money/tickets to be handled at both venues.

Nearer the date there will be a call for volunteers - in the meantime keep the date free!

SUNDAY 2ND OCTOBER. Field meeting to the Bridgnorth area. Leader: Dr. David Thompson (Keele University).

MONDAY 24TH OCTOBER. Lecture: The Geology of the Isle of Man. By Dr. Trevor Ford (Leicester University).

MONDAY 14TH NOVEMBER. Lecture: "Geology - without a rock hammer?" By Kathie Bowden (National Remote Sensing Centre, Farnborough).

MONDAY 28TH NOVEMBER. Lecture: Pleistocene geology of the loess plateau of China. By Dr. David Keen (Coventry University).

MONDAY 16TH JANUARY 1995. Lecture: Tales of teeth and tails - the origin of fish". By Dr. Paul Smith (Birmingham University).

FEBRUARY (date to be advised) AGM followed by a talk "Geology of Iceland" by Alf Cole (Society Member).

EDITORIAL

Is your area short of geological exposures? Do you need somewhere new to go for a short evening stroll? Have you thought of investigating your neighbourhood cemetery? Paul Shilston is booked to speak at a cemetery management training day in Sandwell after becoming interested in the subject and having recently spent the day in West Bromwich cemetery which has a private gate leading from the hospital. Churchyards and cemeteries are being promoted as havens for wildlife but they also serve as geological museums. Paul tells me most cemeteries contain war graves which are always made of Portland Stone. The fossils on the memorials of the first world war have had plenty of time to weather out. In contrast the funereal black 'granite' imported from India fails to weather and is unwelcome in many country churchyards though municipal cemetery authorities are less censorious of its use. If modern talcum powder is still made from talc, geology can certainly be seen to serve us from the cradle to the grave!

REPORTS

"The Building Stones of the Black Country, 17th January 1994

KEITH HODGKISS, architect and past president of the Black Country Society, brought, as he said he would, a different perspective to local geology. He had based his talk mainly on his post graduate thesis because he could find little published on this particular subject.

Mr. Hodgkiss' talk was well-illustrated with slides, the first of which showed part of one of the walls of Dudley Castle. The Castle was built of the local limestone (Wenlockian) as was the Priory, the subject of the second slide. The coarse texture of this stone made it difficult to work and both Castle and Priory show random rubble construction, that is, the stone unsquared and not laid in regular courses. Fossils have been found in the stones of these buildings.

Pictures of the stable block in the Castle grounds showed buildings of the 14th and 17th centuries. The construction of both buildings is of limestone, but now worked and coursed, the working and coursing of the 17th century being the more accurate. The corners of the 17th century stable-block were of worked sandstone which appeared to be of Kinver Triass.

Mr. Hodgkiss admitted to being puzzled by the use of this stone in preference to the more local Gornal stone.

In early times, it seems that Dudley would have been a "limestone town". There is evidence that at least four limestone lodges existed, but now only one remains. There is an original limestone wall in Rutland Passage (off High Street).

A kiln, built from Dudley limestone and Gornal stone, and faced with Stafford blue brick, is now in the Black Country Museum.

Buildings were not the only use for this hard and resistant limestone. It was in great demand as a kerbstone and as a cobblestone.

The next building material considered was Coal Measures sandstone. The building that well-illustrated this was the Masonic Hall at Wednesbury. This sandstone is fine-grained and is suitable for large block-work. We were shown slides of several churches built in this attractive stone, some having their base storeys hammer dressed. The colour varies, Peldon stone is yellow-brown, Downton Castle yellow-buff.

Sandstones weather easily and, as Mr. Hodgkiss pointed out, repairs and renovations to sandstone constructions have often been carried out unsympathetically or without consulting people with expertise.

In the mid 1800s there was a change of style; stone became less fashionable and brick took over, many good stone buildings were brick faced. However, there was still a demand for both limestone and sandstone and both were used in some boundary walls.

We were shown a map of Rowley Regis with its quarries, and were told of an experiment carried out about 1950 by one Mr. Adcock. The idea was to melt Rowley Ragstone, an olivine basalt, and cast it into blocks. This was done at a factory set up by CHANCES. The Junction Inn, Oldbury, showed an example of cast Rowley Rag, although in this instance it was used not only as a cast block for the doorstep, but as decoration as well on the door mantle, plates and knob.

The experiment was stopped because although raw materials were cheap production costs were very high. One of the reasons behind the idea of casting Rowley Rag is that the stone is very hard to work.

Like many basaltic rocks, Rowley Rag is subject to both ONION and SPHEROIDAL weathering and we were shown slides of both these conditions.

I have mentioned but a few slides of the many shown by Mr. Hodgkiss; all were interesting and they demonstrated many aspects of building in and around Dudley.

In the short discussion that followed this most enjoyable talk we learnt that there may be examples of Gornal stone in Penn and in Tettenhall. I shall try, inspired by this evening, to find them.

BARBARA RUSSELL

<u>The Himalayas: A Trekker's Travelogue. 21st February 1994.</u>

The Himalayas are the centrepiece of the vast linkage of European and Asiatic mountain ranges which rose in Tertiary times along the course of the Mesozoic Tethys Ocean, which had divided Eurasia from the Gondwanaland continents.

The Kingdom of Nepal covers an 800 x 150 Km central segment of the Himalayas, including eight of the world's fourteen peaks which exceed 8000m in height. Topographic relief is thus extreme, from the Ganges Plains at around 50m to the summit of Everest at 8848m.

Climatic variation across Nepal is likewise great. The plains are subject to sub-tropical monsoonal regime, while frigid semi-desert tracts occur in rain-shadowed high valleys bordering Tibet. The higher mountain massifs are extensively glaciated, with glaciers often reaching down below 500m.

There is a corresponding variety in the natural vegetation: from dense, tropical hardwood forest, through mixtures of deciduous and coniferous woodland, to scrub, high grassland and alpine flora.

The population of Nepal is now about twenty million and is for the greater part ethnicaly related to the peoples of India. This is noticeable in physical characteristics, religion, languages and other cultural aspects. In the northern high valleys however the inhabitants are Chinese in appearance and tend to be Buddhists rather than Hindus. The economy is dominated by subsistence agriculture. Tourism is growing and currently brings in around US$ 60 million per year.

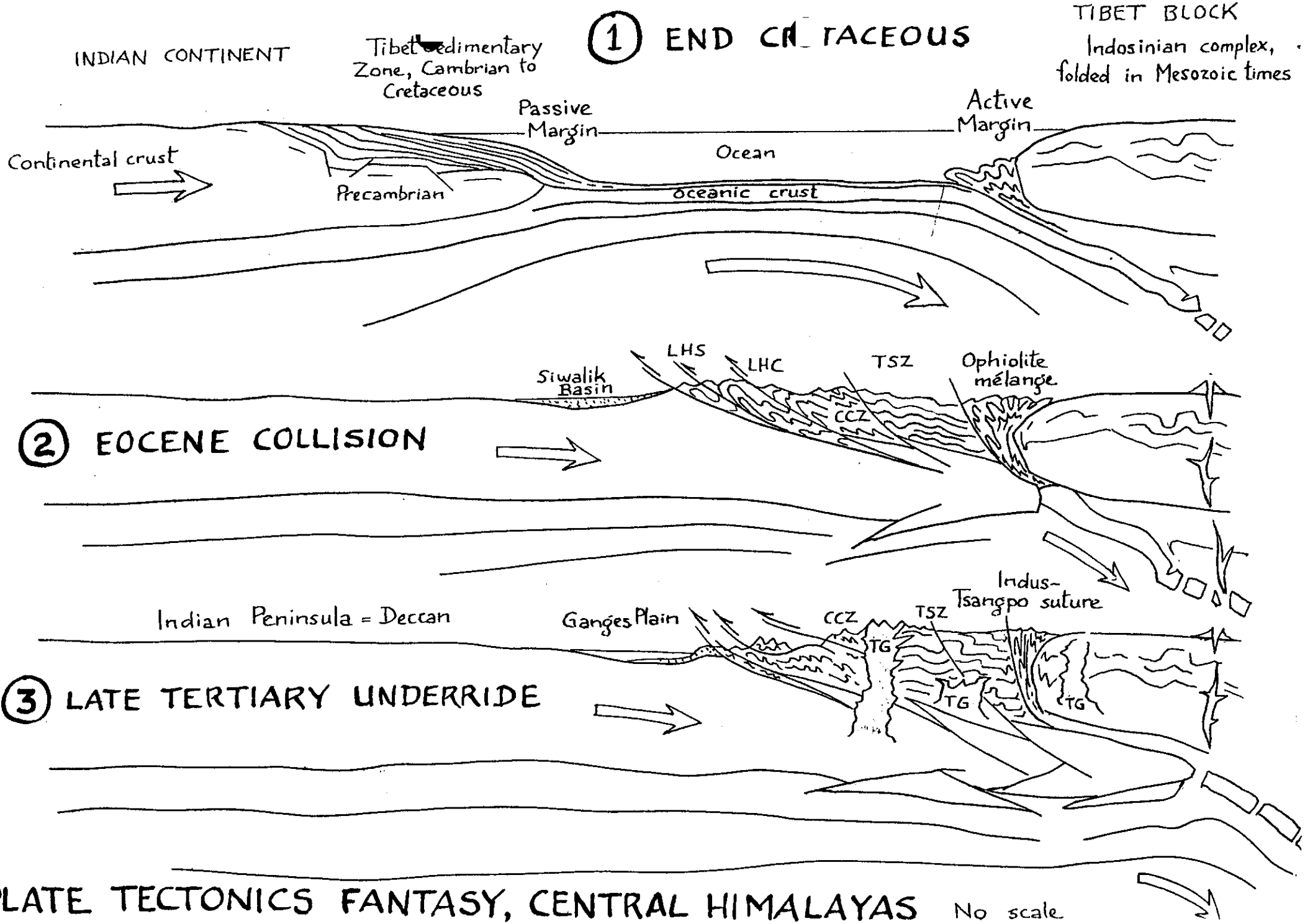
Vehicles can pass from Nepal to Tibet only along the two existing roads; therefore access to most of the mountain areas has primarily to be on foot. Many visitors see the country this way, usually travelling in small groups, backpacking or helped by local porters, and camping or staying in simple village accommodation.

Nepal offers interests to suit many tastes: spectacular natural scenery, mountain climbing, plant life, bird watching, photography, geomorphology, ethnic and land utilisation studies, local history, crafts, drawing and painting, architecture and so on. David Gossage's slides helped to portray some of this wide range. Until 1950 Nepal was closed to virtually all foreigners. Nowadays access is not difficult, even on a limited budget.

Geological complexity increases rapidly north of the Ganges plain, where flat-lying Tertiary and Quaternary sands and shales rest unconformably on Precambrian rocks of the Indian shield. The foothills and mountains consist largely of stacked nappes, i.e. sheets of rock often kilometres in thickness which have been overthrusted for long distances from their places of origin in the Nepal-Tibet border country. Usually there is an increase in the metamorphic grade of the rocks as one travels upwards through the nappes towards the central crystalline zone of the highest mountains.

The Himalayas began to form about 55 million years ago in the Eocene Period. The Indian and Asiatic plates had by that time converged to bring the Indian continental block into collision with the collage of blocks which now makes up Tibet and most of central Asia. The junction between the Indian and Tibetan blocks comes to the surface well north of the high Himalaya and is marked by a narrow belt of squeezed-up deep oceanic sediments, basic lavas and serpentine masses - all witness to the vanished oceanic crust of ancient Tethys.

From the northerly position of this outcropping trace-line, or suture, between the two blocks, it seems that most of the rocks now forming the bulk of the Himalayan nappes had their origin on the Indian continent, mainly as marine shelf sediments from Precambrian to Cretaceous in age. The step-by-step structural growth of the nappes and their southward overthrusting are obscured by regional and local metamorphism, differential melting (= anatexis), and the intrusion of numerous


INDIAN CONTINENT
Tibetan sedimentary Zone, Cambrian to Cretaceous
1 END CRETACEOUS
TIBET BLOCK
Indosinian complex, folded in Mesozoic times
Passive Margin
Active Margin
Continental crust
Precambrian
Ocean
oceanic crust
LHS
LHC
TSZ
Ophiolite mélange
Siwalik Basin
CCZ
2 EOCENE COLLISION
Indus-Tsangpo suture
Indian Peninsula = Deccan
Ganges Plain
CCZ
TSZ
TG
TG
TG
3 LATE TERTIARY UNDERRIDE
PLATE TECTONICS FANTASY, CENTRAL HIMALAYAS
No scale

granite masses of diverse shapes and sizes. Plate convergence did not stop in the Eocene, but continued through Tertiary time as the deep part of the Indian continental slab slid under the Tibet block. This led to great crustal thickening, with concomitant isostatic uplift of both the underriden Tibet block and the Himalayan range.

Numerous geologists from many nations are busy on the problems of the Himalayas and the challenges are formidable. The speaker described how he had passed for days on end through complex arrays of metamorphic and intrusive rocks, all demanding interpretation. Investigations here call for all the skills and aids a geologist can bring to bear, even to make a fair start with the mapping.

DAVID GOSSAGE

Monday 14th March. "The Aeolian Islands - a dying volcanic arc in the Tyrrhenian Sea" by Michael Bamlett (University of London)

The Aeolian Isles are a result of the African Plate subducting beneath the European. The resultant vulcanism can be assigned to two phases. In the first phase, in early and middle Quaternary times, shield series lavas, ash and tephra gave rise to the more westerly islands and sea mounts. These lavas are calc-alkali basalts and andesites. Phase two dates from the Upper Pleistocene and produced the more easterly islands of Lipari, Vulcano and Stromboli. The lavas of these islands are rich in potassium.

Lipari last erupted in the sixth century, yielding obsidian and acid pumice. Vulcano's last eruption was in 1888-90, while Stromboli, the youngest, is well known for erupting every ten minutes.

The plane of the subduction is steeply inclined and Messina can be regarded as the earthquake capital of Europe.

Evidence that the island arc is dying is the absence of calc-alkali crust. It is believed to have been completely subducted. Tha basalts and iron-magnesium rich magmas have erupted to form the base of Lipari and the older more westerly islands and later activity is of the rarer elements left behind, especially potassium rich lavas yielding shoshonite and rhyolite. In general, the level of activity appears to be slowing down.

Vulcano has a shield form, the centre having dropped to form a caldera. Rejuvenation volcanics fill the caldera. Rhyolite is too stiff to flow and the 1890 eruption was a gas explosion. Vulcano was described as a 'constipated' volcano. Fumaroles yield sulphur crystals and the volcano has in recent years shown dilation features where cracks have opened up. Damage to holiday homes is a possibility.

Lipari shows a great range of volcanic activity. The earliest lavas, on the west coast, are basalts. Fragments of cordierite indicate the magma has come through basement rocks. Andesites are found near the main town while the more recent centres in the north east show vast extents of pumice, a result of gas rich eruptions of residual materials. The pumice is almost pure quartz and has been worked and carried away in bulk carriers.

Stomboli is simpler, consisting of one volcano, the last lava eruption dating from 1951. The western side has the younger lavas while active craters occupy the centre of the west. Five centres are in constant

activity shedding tephra. On windy days the village can be covered in iron-magnesium rich ash. Strombolian activity largely consists of gas and ash eruptions, but vesicular lava is shoshonitic.

Salena shows both the older shield volcanic series and the later rejuvenation series.

Panarea shows raised beaches because volcanic islands tend to rise. It has columnar rhyolites.

Filicudi shows a tombola, a result of a subsidiary flank eruption.

Each island's features were liberally illustrated with slides and we were grateful for such a lucid exposition of vulcanicity in a subduction zone.

K.M. ASHCROFT

NEWS IN BRIEF

1. Annual General Meeting

At the A.G.M. held on 21st February the following were elected to serve for 1994:

Chairman: Alan Cutler Vice Chairman: Graham Worton
Secretary: Paul Shilston Treasurer: Judith Shilston
Committee members: Sue Fairclough Chris Jowitt Peter Smith
Hon. Auditor: Geoff Hubbard ACA.

2. Welcome to new members

Adrian Wyatt - Bromsgrove
Joan Savage & family - Cradley Heath
Jean Ritson - Sutton Coldfield
Robin Beton - Sutton Coldfield

3. Bargain Offer!

The excellent geological guide to the MALVERN HILLS by David Bullard was originally published by the Nature Conservancy Council at £7-50. It is now being discontinued and The Map Shop at Upton-on-Severn has a small number on offer at the attractive price of £3-00 plus 36p postage. After that it will no longer be available.

4. Natural History Museum, London

Details and Booking: Dr. Alam Timms, Field Study Tours,
The Natural History Museum
Cromwell Road
London SW7 5BD

(a) Geology of Atlantis - Crete & Santorini, 28 April - 12 May 1994. £675.
(b) Geology in Western USA. 19 May - 9 June 1994. £1800.
(c) Natural History in China. 4-25 September 1994. £2800.
(d) The Central Aegean - geology & scenery. 8-23 September 1994. £665.

(e) Geology of Caen, Normandy, weekend 14-17 October 1994. £280.
(f) Geology of Hawaii & New Zealand. 3 weeks, February 1995.
(g) Geology in north-eastern USA. 2 weeks, Autumn 1995.

5. University of Hull

Details and booking: Dept of Adult Education
University of Hull
49 Salmon Grove
Hull HU6 7SZ
phone: 0482-465524

Geology & scenery of the islands of Mull and Iona, 14-21 May 1994. £315.

6. INTERCEPT

Intercept is a small publishing house which has recently taken over the sole distribution of the Natural History Museum's publications. Their latest geology publications catalogue is available from:

Intercept Ltd
9 Farriers Close
Colehill
Wimborne
Dorset
BH21 2UA

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