

GEOLOGICAL SECTION OF THE NATURE CONSERVANCY

INFORMATION CIRCULAR 2

OCTOBER 1968

In January 1968 the Geological Section of the Nature Conservancy issued its first Information Circular containing a number of items of general concern to geologists. It stimulated support for the activities of the Geological Section and led to readers bringing a number of further matters to our attention.

Since January a number of queries concerning the Conservancy's responsibilities, powers and mode of operation in geological conservation have been received and it is hoped that these will be answered by the attached leaflet entitled "Geological Conservation for Industry, Education and Research".

Attention is drawn below, in the cases of **Quarry Moor**, Yorkshire and **Weydale Quarry**, Caithness, to the need to report to the Conservancy all localities of geological importance before they are threatened or damaged. It is exceedingly difficult for the Conservancy to defend an important locality whose existence is not recorded before it is in danger of losing its scientific interest. It is quite impossible for the Conservancy to use its statutory powers once planning permission has been given for the "development" (e.g. rubbish tipping) of a site. There is thus a pressing need for all sites of value to be brought to the Conservancy's attention, even though there would not appear to be the remotest chance of their ever being endangered.

At present the Nature Conservancy is compiling an inventory of localities of geological and biological interest throughout Britain; this inventory will serve as a basis for future conservation programmes. It is a matter of urgency for all geologists to ensure that all localities they consider important are considered for inclusion. The Geological Section will be happy to answer queries as to which sites are at present included and to receive proposals for further sites, preferably quoting their grid reference and a few words on their importance and interest.

The Geological Section,  
The Nature Conservancy,  
Hyde End Lane,  
Brimpton, Reading,  
Berkshire.

GEOLOGICAL NATIONAL NATURE RESERVES

Wren's Nest, Worcestershire

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The booklet describing this Reserve was published last Autumn; 2,500 copies have been sold in the first year and the edition is now approaching exhaustion. The high level of demand shows the need for self-guiding nature trails and also the spread of interest in geological field work taken by members of the lay public.

During Easter 1968, the Conservation Corps cleared a section at the south end of the hill to expose the main fault. It is now possible to see Nodular Beds faulted against Lower Quarried Limestone and crushed and deeply weathered Wenlock Shale with a clear difference in dip. Minor disturbances in the Lower Quarried Limestone add further interest. Though the Reserve is ideal for demonstration of the topographic expression of faults, no actual exposure of a fault has been available in recent years. Time did not permit the completion of this large scale project and it is hoped to improve the exposures further next Easter.

All underground workings on the Reserve have had to be closed, even for research purposes, owing to their highly unstable condition. An assessment of the problems involved is being made by Dudley Borough Council, the owners of the Reserve.

Swanscombe, Kent

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By far the most important palaeontological development on the Conservancy's National Nature Reserves in 1968 has concerned the Swanscombe Skull Site in Kent. After preliminary activity during the Winter and Spring, the Royal Anthropological Institute sponsored an excavation from July to September under the direction of Dr. J. A. Waechter of the Institute of Archaeology, University of London, to investigate the Lower Gravels as part of a much more ambitious project.

The main excavation is through the entire Lower Gravel and Lower Loam succession and has yielded quantities of bones and artefacts. The Lower Loam is not sterile, as was originally thought, but has sparse artefacts. The excavation is believed to lie on the southern bank of a former river and the evidence available suggests that occupation sites may be found immediately to the south. A small excavation has also been made in the Middle Gravels to display a section through strata which recently have been obscured. It is expected that the present programme will continue until 1971.

Ebbor Gorge

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Mrs. Hodgkinson, for many years the owner of Ebbor Gorge and Wookey Hole Cave, recently presented the Gorge to the National Trust as a memorial to Sir Winston Churchill. The Trust subsequently leased 101 acres of the Gorge to the Nature Conservancy and this area was declared as the Ebbor Gorge National Nature Reserve on 12th March 1968. In addition to its biological importance, the Reserve is of considerable geological and archaeological interest and it is the

intention of the Conservancy to give research workers in these fields every possible assistance. An Advisory Committee has been set up and comprises Mr. Mason (Mendips Nature Research Committee), Dr. Rosenfeld (British Museum), Dr. Savage (Bristol University), Dr. Wallis (Wells Museum) and Dr. Warwick (Birmingham University), in addition to members of the Conservancy's regional and geological staff. Geologists interested in working on the Reserve should contact, in the first instance, the Conservancy's Regional Officer for South-West England, Mr. W. O. Copland, The Nature Conservancy, Furzebrook Research Station, Wareham, Dorset.

#### LOCALITIES OF GEOLOGICAL INTEREST

In Summer 1968 two sites were brought to the Geological Section's attention as in need of preservation. Unfortunately neither was reported to the Nature Conservancy until "development" had been proposed, and in one case, had been taking place for over ten years. Under these circumstances the Conservancy could not use its formal powers but could only advise other bodies on suitable action and assist in making informal approaches to the planning authorities. Such eleventh hour action is fraught with difficulties - in both the present cases, fortunately, the outcome was favourable.

#### Weydale Quarry, Caithness

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This disused quarry, rich in fossil fish, is internationally important in correlating the fauna found here at this Middle Devonian horizon with that of other countries. In July 1968 an application for tipping in this quarry was received by Caithness County Council from Thurso Town Council, and indirectly drawn to the Conservancy's attention following complaints made by local geologists to the British Museum (Natural History). Following representations by the Conservancy, planning permission was refused, and the whole question of the conservation of the Scottish O.R.S. fish localities is now under review. Details of other fish localities requiring attention will be gladly received by the Geological Section.

#### Quarry Moor, Ripon, Yorkshire

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Information was received in May 1968 that this quarry, used by West Riding County Council as a rubbish tip for ten years, was unique in Yorkshire in showing the development of a carbonate-rich facies of the Middle Permian Marl, with evidence of the former presence of evaporites, resting on the fossil equivalent of a modern intertidal coastal plain deposit. It was estimated that in four years the exposure would be completely buried by refuse. The Yorkshire Geological Society and the Yorkshire Naturalists' Trust obtained the agreement of the Council to preserve an exposure 70 yards long.

#### Holwell Quarry, Nunney, Somerset.

Following reports that geologists were being denied access to this quarry, which exposes Rhaetic-filled fissures in Carboniferous Limestone the Geological Section informed the Conservancy's South-West Region. A member of the Regional staff visited the quarry and was assured by the manager that parties were allowed access subject to conforming with a few reasonable conditions. Application for access should be made to Mr. Frost, Manager, Holwell Quarry, Nunney, Somerset.

GENERAL TOPICS

X X Card Index of Geological Literature

The Geological Section of the Nature Conservancy has now compiled a reasonably complete card index to geological literature, arranged on a county basis, covering England, Scotland and Wales. In addition to the main national and the more productive foreign journals, all available local and natural history society journals have been covered; to our knowledge there is no similarly comprehensive index available to geologists in Britain. Anyone wishing to use the index will be welcome, but will have to visit Brimpton since the Geological Section has not staff available to abstract the index or to undertake the correspondence likely to be involved.

Survey of Limestone Pavements of Northern England

X 31 Limestone pavements are a highly vulnerable feature of geological interest and are currently suffering heavily from working for "waterworn" rockery stone. The Nature Conservancy has successfully contested a number of Public Inquiries to prevent further damage to the pavements in the Ingleborough area. In 1965 a detailed survey of the Ingleborough S.S.S.I. was made by the Conservation Diploma Course students of University College, London when it became apparent that pavements are remarkably variable in character and that there is some urgency in ensuring that a fully representative series is conserved.

The Geological Section accordingly embarked on a survey of limestone pavements in the West Pennines, as far north as the Cumberland border, and including the southern margin of the Lake District. Two geologists in the 1968 Summer vacation, defined (on 2½ inch maps) occurrences of pavement in the course of a rapid reconnaissance of a large area and submitted a report and photographic record. Information on pavements in any part of the country would be welcomed.

EDUCATION

X 50 New Survey of the Distribution of Student Field Instruction in Geology in Britain

The continued growth of field instruction at all academic levels exerts an increasing pressure on geological exposures. Many sites suffer as a result - overuse of the hammer builds up scree, while landowners, faced with the rising tide of geological visitors, have in many instances become reluctant to allow parties on to their land. As conspicuous features of the countryside in many areas, geologists are often the scapegoats for any damage done to walls, crops and stock. Any attempt to solve this requires to be based on quantitative data to have any real prospect of success.

Such data is particularly valuable to the Nature Conservancy for assessing the need for educational S.S.S.I.'s and for supporting the conservation case to Planning Authorities and to Inspectors at Public Inquiries when the scientific worth of a site has to be evaluated. Often developers claim that geologists never visit a site, (and infer that consequently it is valueless) when we believe that it is visited by many parties; our case immediately becomes stronger when we can refute such claims with factual evidence.

In 1965, a questionnaire was sent to the Geology Departments of all Universities and Technical Colleges and, with one exception, all replied. For this initial survey we asked only for details of field trips lasting two days or over in the period 1963-1965.

The results of this survey were published in the Welsh Geological Quarterly for 1966, Vol. 1, No. 4 pp. 3-6. In the three years there were 30,081 student days spent in England, 12,005 in Wales and 13,017 in Scotland - a total of 55,103 student days. The most popular areas were the Dorset coast (5,996), Pembroke (4,860), Arran (4,521) and Shropshire (4,217).

The data collected in 1965 is now somewhat out of date and its incompleteness has not made the survey as effective as would be desirable. Accordingly a new and more complete survey is to be carried out in the near future and it is hoped that once again geologists will co-operate in forging an improved version of what has proved to be one of the most effective weapons in the armoury of geological conservation. In addition to long field trips, the new survey includes day trips and mapping exercises, not only of Universities, but also of schools. The lack of information for short trips has proved a serious gap in the available data - for instance there must be many University day excursions to the Peak District, yet this area came out low on the list for long trips. Also an unfortunate position recently arose at a Public Inquiry near London because there was no data on day trip usage.

The coverage of schools has only become possible with the recent formation of an Association of Teachers of Geology. Separate sheets indicating the information required are being circulated concurrently with this circular.

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Student Erosion in Pembrokeshire

Pembrokeshire is the second most heavily used district in Britain for field instruction at University level and is also popular for school parties. Mr. J. Barrett, Warden of Dale Fort Field Studies Centre (Field Studies Council), has written to us expressing his deep concern over the inconsiderate use of educational exposures and has requested publicity for the following statement:-

"The Haverfordwest Corporation has just had to clear away more than five tons of spoil that was spilling onto the road from the foot of the exposure of the Gasworks Sandstones of the Lower Llandovery. At least another five tons is heaped back against the face. Any more hammering of this exposure, except amongst the spoil, will lead to the denial of access to it in defence of the footpath above. The crude assault with hammers by parties of students is defacing too much of interest to geologists in Pembrokeshire; every year is worse than the last. The Nine Wells trilobite site in the Menevian is a mess. What is the point of smashing up erratics which are interesting and good teaching material only as long as they lie there? This appeal is to all those who organise field trips, to see to it that only the most circumspect use of hammers is allowed on living material and that far more use is made of spoil heaps. These heaps are not the waste material of serious work but come from unthinking, undisciplined banging away, followed by minimal, or no, inspection of what falls. The evidence for the teaching of conservation in geology departments is conspicuous by its absence amongst too many students".

Woodperry Road Pit, Oxfordshire

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In Information Circular No. 1 it was reported that a group of students from the Conservation Corps had cleared a section at Bugle Quarry, Buckinghamshire. A similar party was made available in July when the Corallian section at Woodperry Road Pit was cleared, with the kind agreement of the owner. The site lies near an important facies change and is regularly used for educational purposes.

Mr. J. M. Edmonds (Oxford University Museum) and his assistant provided advice in the field on the most profitable section to clear. The higher part of the succession being fairly well exposed, attention was paid to the beds below the Oyster Clay and Shell Pebble Bed (Osmington Oolite Series). In two excavations in the north-east corner of the quarry a total of 12 feet of Berkshire Oolite Series was exposed, extending the succession described by Callomon (1953, Proc. Geol. Assn. 64: 83-87). The lower horizons correspond to the description given for beds 1a.

An item on Motorway Geology - a Schools Project is included under Road Schemes below.

ROAD SCHEMES

Research on Exposures Opened During Motorway Construction

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Many valuable research opportunities are lost because news of sections associated with road schemes is not circulated quickly enough. The Geological Section of the Nature Conservancy is concerned at the continuing loss of exposures potentially of great importance which it might have been possible to record, sample or even have made permanent - negotiations for permanent exposures instead of the typical battered and grassed cutting have already succeeded.

Following the request for action on the M.4 cuttings made in Information Circular 1, several geologists evinced interest. Later it was realised that the M.5 north of Bristol had considerable research potential and a meeting was convened by the Geological Section and attended by representatives from the London Colleges, the Institute of Geological Sciences, British Museum (Natural History), Geologists' Association and Geological Society. It emerged that several geologists were interested in the research prospects of the M.5 and the meeting strongly recommended the Conservancy to treat other road schemes in the same manner.

As a result of discussion at the M.5 meeting the following procedure will be adopted. The Nature Conservancy already receives all draft schemes relating to motorways and trunk roads. Many of these schemes will obviously produce no exposures of significance and can be ignored, but the remainder will be listed in this series of Information Circulars. Research workers interested in any of these schemes should write to the Geological Section of the Nature Conservancy when, if sufficient interest is shown, a meeting of the M.5 type will be called. For schemes where a number of geologists wish to do research, it is hoped that one will agree to act as co-ordinator to form close liaison with road engineers and to advise the other research workers of progress with the scheme and the dates of excavation. In some cases the consulting engineers can vary details of cutting design (e.g. to leave vertical faces), in others it may be necessary to arrange a meeting between the engineers, the co-ordinator and the Geological Section to

discuss requirements, including access. All inquiries should be relayed through the co-ordinator who will advise the Geological Section when problems arise and when action is required. In many instances where soft rocks are exposed, it will be impractical to seek permanent exposures, but the above procedure will allow workers the opportunity of making the fullest use of sections which can only be temporary.

Only Ministry of Transport Schemes can be covered in this way. Many valuable sections are temporarily available on schemes made by County or Local Authorities (e.g. Crickley Hill, Gloucester). The Geological Section cannot at present monitor all types of road scheme and if anyone should hear of proposed schemes, or see new cuttings which are of particular interest, they should contact the Geological Section immediately giving details of location and interest.

x, 34 M.5 Motorway, Gloucester - West Mendips

Extensive cuttings are proposed in the Silurian, Carboniferous, Keuper, and Lower Lias, plus more limited sections through Upper Devonian, Rhaetic, terrace gravels and a basalt intrusion. Thrust faulting should be displayed east of Clevedon. Many of the more interesting exposures will be in soft rocks and will therefore be temporary, but arrangements have been made with the consulting engineers for a flexible policy to be adopted along certain sections of the new motorway in case features of special value are exposed in more durable strata. The first exposures are expected to be available next Summer and will occur in the northern part of the scheme.

The co-ordinator is Dr. M. Curtis, Curator of Geology, Bristol Museum, The following research interests have been drawn to the engineer's notice - Dr. Curtis, Silurian; Dr. E. Robinson (University College, London), Silurian microfossils; Mr. Allen (Reading), Devonian; Dr. Chaloner (University College, London), Rhaetic palaeobotany; Professor T. Barnard (University College, London), Lias microfossils.

24, 34 Elloughton Bypass, Near Hull

Numberside

The line of this scheme traverses the entire Jurassic outcrop and there will be a number of cuttings opened in Spring - Summer 1969. The road engineers are prepared to discuss the permanent retention of any faces of particular value where the rocks will stand as a vertical face.

The co-ordinator for this scheme is Mr. B. Latham, Keeper of Geology, 23-24 High Street, Hull, Yorkshire.

22, 34 Swansea Bypass

WEST GUMBEAN

This projected new road will transverse Coal Measures. There has been a delay in obtaining detailed plans but these should be available for publication in the next circular.

The co-ordinator is Dr. G. Kelling, Department of Geology, University College of Swansea, Singleton Park, Swansea. Members of the Department are interested in the prospects for study of the Coal Measures, structures and drift.

Visiti

25, 34 M.4 South of Swindon

Information Circular 1 reported the research interest in the Lower Chalk. The co-ordinator (for Lower Chalk only) is Dr. C. Jeans, Sedgwick Museum, Downing Street, Cambridge.

20, 34 M.6 - Walsall Inlier

(WEST MIDLANDS) | LINCOLNSHIRE

Following an inquiry from Dr. R. Cocks, British Museum (Natural History), the consulting engineers for this scheme were approached concerning the possibility of exposures being opened in the Silurian of the Walsall Inlier. Unfortunately it was found that the M.6 will run on embankments and there is no prospect of permanent cuttings. Temporary exposures in Wenlock Shale may be available in the foundations of Bridge 304 over the Ruchal Canal at 42/031948 which will be 6 feet to 10 feet deep. Those wishing to arrange to examine this site should write to J. G. Williams, Sir Owen Williams & Partners, Welton Station, Watford, Rugby, Warwickshire.

24, 34 Crickley Hill, Gloucester

Excellent exposures in the Upper Lias and Inferior Oolite have been available during the widening of the A.40 six miles east of Gloucester. The horizons at the junction of these two divisions cannot otherwise be seen in the Cotswolds and this locality should become a key research section.

At the request of Dr. Ager (Imperial College), the Conservancy discussed the final finish of the cuttings with the engineer in charge. Instead of a battered face as originally intended, it has been agreed that a representative section will be left open to display the top of the Cotswold Sands and overlying Black Clay (Upper Lias), the scissum Beds and the base of the Lower Freestone (Inferior Oolite). The higher exposures including Pea Grit and Upper Freestone could not easily be left as a face, and, since good alternative sections are available, these are not to be subject to preservation measures. This agreement has met Gloucester County Council's approval, but is subject to no unexpected engineering problems arising.

25, 34 Possible Geological Sections along the M.40 Motorway

CYPRUS 11.10

The route of the proposed M.40, linking London and Oxford, crosses the Chalk escarpment of the Chilterns in the neighbourhood of Aston Rowant National Nature Reserve. Many routes have been considered and no final decision has yet been reached; it is uncertain whether the road will cross the escarpment in a cutting or a tunnel. Should a cutting be preferred it will provide a continuous section through 170 feet of strata, mainly Upper Chalk. As the Nature Reserve lies on, or close to, the motorway route, the Conservancy is taking an active part in current discussions. The Geological Section is keeping in close touch with developments and will publicise research opportunities as they arise during the construction of the road.

### Visiting Motorway Exposures

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It is not widely realised that the Conservancy has had, for several years, an understanding with the Ministry of Transport whereby research geologists can gain access to motorway cuttings. Some University staff, however, have been able to gain access through independent approaches to local highway engineers. Such approaches have been found to be erratic in their degree of success and frequent problems have arisen with the motorway police.

Those wishing to gain access to completed motorways should contact the Geological Section of the Nature Conservancy who will guide requests through the official channels. This facility is not available to educational parties, since the authorities, still cautious over letting single individuals walk on the hard shoulder, will not countenance requests from parties of more than two or three.

### Geological Motorway Projects in Schools

X, 43, 37  
Wiltshire Schools are embarking on an M.4 project covering various aspects of the biological and geographical impact of a motorway in their region. Several schools will be studying the geology of sections of the motorway while it is under construction.

This original work by schools is to be encouraged and should not clash with more academic research. However, there may be cases where undue collecting enthusiasm by numbers of school children could seriously curtail the value of a research project and school masters taking part in this or similar projects are asked to contact co-ordinators or the Conservancy as appropriate. There will be many instances where research is only covering part of the available sections and schools can usefully record the otherwise neglected portions. Their work may prove useful by drawing research workers' attention to interests which would otherwise have been missed.

## PIPELINES

### X, 33. Gas Pipelines

The construction of long temporary sections during the sinking of pipelines offers a potentially useful research opportunity. Unfortunately, along any one stretch, the trenches are open only for a day or two and the timing of research visits is therefore crucial.

The Nature Conservancy can have no direct interest in such very temporary exposures, but in view of the number of comments on lost opportunities raised by geologists, we have consulted the Gas Council on behalf of those interested.

We shall issue a list of pipelines in this series of Information Circulars and those who have particular research interests may contact Mr. R. O. Emmony, Pipeline Construction Engineer, Gas Council, 59 Bryanston Street, Marble Arch, London, W1A 2AZ, who will make detailed plans available and provide contact with the appropriate construction teams so that up-to-date information on the timetable for opening trenches can be made directly available.