No. 8 Compiled by: M. Goodchild [redacted] Redhill, Surrey.

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Produced by 'The Conchological Society of Great Britain and Ireland'

FIELD MEETING AT NORWICH, MARCH 9th. 1963

Report by Director: Mr. P. G. Cambridge

Two members travelled up from London for this meeting and were met by two members from Norfolk and one member of the Paramoudra club joined the party. The party proceeded to Bramerton by bus and walked down to the side of the river in miserable weather. However, the weather failed to damp the spirits of members once a shelly bed of Crag was uncovered by the spades!

The stratigraphy of the Norwich Crag of this area was demonstrated in an old excavation made by Dr. Funnell. Next a very fossiliferous bed in an old pit a few hundred yards away was visited. Here good examples of curiously distorted Littorina and Nucella, similar to those described by S. V. Wood and F. W. Harmer, were found. Some of the Littorina are so strongly ribbed and keeled as to be almost unrecognisable. The reasons for the curious burst of monstrosities at this horizon were discussed but without coming to any definite conclusion.

Other fossils are also abundant at Bramerton and the following species were obtained by members:

Macoma calcarea
" obliqua
Mya arenaria
Hiatella arctica
Venus imbricata
Modiolus sp.
Mytilus edulis
Cardium edule
Chlamys opercularis
Arctica islandica
Spisula subtruncata
Littorina littorea
" rudis
Nucella lapillus
Neptunea antiqua (one reversed example)
Natica sp. juv.
Hydrobia cf. ventrosa
Potamides icenicus
Calyptraea chinensis
Fish Vertebrae
Borings of Polydora, Cliona, etc.

The party then split, the more energetic members walking back to Norwich via the somewhat aromatic Whitlingham marshes. Here Viviparus contectus, V. viviparus, Anodonta cygnaea, A. anatina and A. minima were found on the banks of the ditches draining the marsh which had recently been cleared out by mechanical shovel.

A quick visit was paid to Whitlingham Quarry where good sections of Norwich Crag rest on the top of the Chalk. Here the variability of the deposit was excellently demonstrated; clay, shelly sands and pebble beds alternating while the basal Stone Bed, composed of large fairly unworn flints can be seen at the junction with the Chalk. Some large specimens of Neptunea were seen, Mya arenaria in situ in the position of growth and one of the 'butterfly bones' of Platax came to light, as well as other species similar to those at Bramerton.

The party re-united at the Castle Museum, Norwich, where Mr. R. Markham, the Deputy Curator of Natural History, kindly displayed a series of Bramerton fossils from the Museum collections, including a number of Harmer's figured specimens.

THE STROPHOCHEILIDAE:

A NEOTROPICAL FAMILY OF TERRESTRIAL MOLLUSCS

The Strophocheilidae contain some of the largest living terrestrial snails, they are amongst the more conspicuous members of the South American

fauna. Being at the same time peculiar to the New World, they are one of the distinctive elements of the Neotropical Region. To the zoogeographer they are of more than usual interest as representing a S. American branch of the Acavid stock, an ancient, primitive group of pulmonate land snails with a disconnected circumpolar distribution in the Southern Hemisphere. Most authors speculate that the ancestors of the recent superfamily Acavacea originated at some remote geological period (probably before the Mesozoic) on a single fairly continuous Austral continent extending perhaps at one time from the S. Pole to near the Equator. When this hypothetical 'Gondwana Continent' broke up, supposedly from the middle of the Mesozoic onward, it is claimed that the descendents of the primitive Acavacea became isolated in four widely disconnected areas, where further evolution eventually produced a number of distinct Recent groups, now ranked either as families or subfamilies. These areas are Australia, Madagascar and Ceylon, South Africa and South America.

In South America the superfamily seems to have survived well, as it now covers a very wide area and comprises more species than elsewhere, the majority of them being bulimoid (Strophocheilidae), with a few helicoid forms (Macrocyclidae) restricted to Chile. Some authorities believe that the Strophocheilidae are amongst the most primitive of the Recent Acavacea, which might indicate that South America was furthest from the primitive centre of evolution of the superfamily. Moreover, the Strophocheilidae probably arose from the same ancestoral stock as the Bulimulidae, a non-acavid family of land snails now dominant in the New World tropics.

The Strophocheilidae are divided into two Genera. Strophocheilus and Gongostomus. In Strophocheilus five subgenera are recognised, Strophocheilus, Speironepion, Megalobulimus, Austroborus and Chiliborus, and in Gongostomus two, Gongostomus and Anthinus.

The family is indigenous in S. America north of 40° Lat. S., including Trinidad. The occurrence of S. (M) oblongus (Müll.) in some of the Antilles proper is due to introduction by man. None have been found north of the Isthmus of Panama. There appear to be four main centres of density of species. The most important of these is in the eastern half of Brazil, from Maranhao to Rio Grande de Sul, the home of all the 4 species of Gongostomus, 2 species of Speironepion and 7 species of Strophocheilus s.s., as well as 10 species of Megalobulimus. A second centre is in the Andean area, from Bolivia to Colombia, which harbors 8 species of Megalobulimus. The subgenera Austroborus (3 species) is peculiar to Uruguay and Northern Argentina, while Chiliborus (4 species) is restricted to Central Chile. Only one species, S. oblongus is more generally distributed and has produced some peculiar races in Southern Brazil and the Uruguay-Argentina area.

The very large species of the subgenera Megalobulimus are exceeded in size only by certain African Achatinidae and are amongst the largest known living terrestrial snails, S. (M) propelairianus (Nyst) from Ecuador attaining a length of 163 mm.

The families Strophocheilidae and Achatinidae seem to replace each other on their respective continents, where they occupy to some extent the same ecological niche. The South African Metachatina and the Central African Burtoa particularly simulate certain species of Megalobulimus, the shells of the two families having become superficially similar through convergence.

All the Strophocheilidae are terrestrial, most of them prefer well-sheltered, damp, deeply shaded places, densely covered with vegetation, such as ravines in virgin forest. They appear to be nocturnal, hiding under humus or in loose soil by day. At times of drought they bury deep down in the ground or crawl into crevices of rocks or in caves, where they aestivate, after closing the aperture with an epiphragram. As a result of the destruction of the forests in certain parts of Brazil, some of the species have become very scarce or possibly even extinct. The species of Chiliborus and Austroborus favour a more xerophytic environment and hide beneath rocks or in loose sand.

Several of the larger species were formerly eaten by the Honative Indians and S. ovatus was still offered for sale in the markets of Rio de Janeiro as late as 1867. This custom seems, however, to have been

discontinued.

The eggs of the big species of Megalobulimus are very striking objects on account of their size, that of S. (M) propelairianus being as large as that of the common pigeon. In Barbados, the white of the egg of S. (M) oblongus has been used as a glue to mend china and glass and is claimed to be superior for this end to any manufactured product.

T. Pain

BRIEF NOTES

1. IMPORTANT: CHANGE OF ADDRESSES

a) The Hon. Secretary,
Mr. T. E. Crowley,
[redacted]
Bampton,
Oxfordshire.

b) The Hon. Editor,
Mr. A. E. Ellis,
[redacted]
Carshalton,
Surrey.

2. The Compiler regrets the lateness of this number of the Newsletter but hopes to produce another number before the end of the year. Any member who has not received a reply to his/her letter will be answered shortly.

3. More short articles are required for the Newsletter, and the Compiler would like to hear from anyone who would care to contribute to one of the series of geological articles - especially those on the Pleistocene.

4. INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

Notice is given of the possible use by the Commission of its plenary powers in connection with the following cases, full details of which are published in the Bulletin of Zoological Nomenclature, Vol. 20, Part 3:

Z.N.(S.) 1521. Designation of a type species for Pisania Bivona, 1832 (Gastropoda).

Z.N.(S.) 1526. Designation of a type species for Ceratomya Sandberger, 1864 (Bivalvia).

Anyone who wishes to comment on either of the above cases should do so in writing, and in duplicate, before 26th. October. Each comment should bear the reference number of the case in question. Comments received early enough will be published in the Bulletin; they should be addressed to the Secretary, International Commission on Zoological Nomenclature, C/o., British Museum (Natural History), Cromwell Road, London, S.W.7.

5. Miss A. Bauer, [redacted] Sydney, N.S.W., Australia, writes: "it would be a great thrill and also big help to my collecting if you would kindly publish my invitation to students of conchology and collectors from Great Britain and from all over the world to exchange friendly correspondence and sea shells with me. I could send in exchange for sea shells following items from Australia:

Australian sea shells
Books, Magazines and Newspapers
View Cards
Stamps and First Day Covers
Handicrafts and souvenirs made by Australian Aborigines."

6. WANTED. 'British Snails' by A. E. Ellis - E. Fogen, [redacted] Manchester.

7. FOR SALE. 'The Genera of Recent Mollusca' H. & A. Adams, 1858, 3 vols., £4.10.0 (incl. pkg. and postage). Apply to R. MacDonald, B.Sc., [redacted] Belfast [redacted], Northern Ireland.

9. The Compiler is indebted to Mr. W. Pettitt for pointing out an error in 'C.N.7' in relation to Brief Note No. 20 (p.40). The relevant lines should read Vol. 17, Parts 1 - 9 (only 9 issued)
Vols. 19, 20, Parts 1 - 11 (only 11 issued)
Vols. 15 - 23 (inclusive) can therefore be obtained complete.

GEOLOGY FOR CONCHOLOGISTS

1. Introduction.....M. Goodchild

For the benefit of conchologists having no special knowledge of geology, a series of articles is to be produced to explain the fundamentals of geological knowledge of greatest interest to them. Two sub-sections of the science are important - stratigraphy and palaeontology. Stratigraphy is concerned with the relative order of deposits and palaeontology with the study of fossilised remains of former living organisms.

Perhaps by now, you may be wondering what this has to do with conchology.

Any one moment in time can be regarded as a photograph. A series of them taken in chronological order would constitute a cinematographic film - a complete record of the earth's history. The study of living species of mollusca (conchology) is like the snapshot. To find how they came to be thus (evolution) and why they are found where they are today (distribution) we require knowledge of past 'photographs'. The rocks and their fossils give us these required 'snapshots'. A more correct analogy of geological study is with a cine film taken on a partially fogged negative so that definition is irregular (imperfection of fossilisation) and which has subsequently been badly'cut' (imperfection of geological record). The elucidation of the order of the strata and recognition of gaps (unconformities) both large and small is the province of the stratigrapher. A sequence of systems (groups of geological beds) has been elucidated which is based mainly on unconformities and is given in the table. The recent science of geochronology has been able to give tentative absolute dates to the ages of the rocks. These are subject to variation as methods improve or a determination is proved false. The relative ages are now well established.

Classification of Sedimentary Rocks

Era	System	Age of base in years
QUARTERNARY	Holocene (= Post-glacial) Pleistocene	8,000 B.C. 1 million
CAINOZOIC	Pliocene Miocene Oligocene Eocene	11 " 25 " 40 " 70 "
MESOZOIC	Cretaceous Jurassic Triassic	135 " 180 " 225 "
PALAEOZOIC	Permian Carboniferous Devonian Silurian Ordovician Cambrian	270 " 350 " 400 " 440 " 500 " 600 "
PRE - CAMBRIAN		-

The major unconformities between systems are not world-wide but localised (e.g. to Europe west of the Urals) and smaller unconformities

can be present even within systems in localised areas. In another large area, e.g. Australia, no unconformity may be present and rocks may gently grade from one system to another, while beds present here represent unconformities there.

The stratigrapher's task is also made more difficult by mountain building which folds and distorts the rocks. Thus the negatives of our analogy have been torn up and the remnants crumpled up!

After the stratigraphy has been elucidated the palaeontologist can begin to work out the former distributions of species and the effect of changes of climate, etc. on these distributions.

Of course in the history of geological research no branch of geology can be isolated from another as I have tried to do in the preceeding paragraphs but both have progressed together.

Conchology, not only has benefited from geology, but has, and still is, proving of great assistance to geology.

The identification of fossils and recognition that they are kindred to particular living species indicates the type of environment they lived in, e.g. on broad lines whether the rock bed is marine, freshwater or land. Land deposits, however, apart from the Quarternary Period rarely contain land shells or any fossils.

An example is the Bembridge limestone of the Isle of Wight which contains myriads of Lymnaea and Planorbis showing the deposit was formed in freshwater, not marine, a great help, as most rocks have been formed under marine conditions. This fact was recognised very early in geological investigations. The freshwater nature of these beds was found in the late 18th. century when geology as a science was first emerging.

In this series of articles each will be devoted to a part of the geological column. In geology it is often more convenient to work back in time, as the older the rocks, the more distortion that has taken place.

The first few articles will be devoted to the Quarternary era. This is one of the more perplexing groups of sediments - it was once said (about 1930) that more papers had been written on this era than on all the others together! This is due to the very fragmentary nature of its deposits and the relatively short time of geological history it represents. It is divided into two systems, the HOLOCENE and PLEISTOCENE, though some regard all the deposits as one system, the Holocene being called the 'Post-glacial'.

2. The last 15,000 years.....Dr. M. P. Kerney

This article deals with the Post-glacial (or Holocene Period) and the Late-glacial phase of the last glaciation.

Subdivision of the last million years, that is roughly the time which has elapsed since the beginning of the glaciations, is effected mainly on climatic criteria. The Post-glacial Period, in which we are living, is defined as starting when world temperatures first began their steep and maintained rise at the end of the Last Glaciation, round about 8,000 B.C. In northern Europe this climatic improvement allowed birch and pine forests to invade rapidly what had previously been a tundra landscape. But the first evidences of a climatic change already appear rather earlier than this, about 12,000 B.C.: an episode with a transitional (late-glacial) climate can be recognised, given a very distinctive character by the occurrence within it of a well-marked but temporary climatic improvement known as the Allerød Oscillation. The Late-glacial Period thus comprises two rather cold phases (Older and Younger Dryas), separated by a cool-temperate interval (Allerød), which can be regarded as a kind of false dawn to the Post-glacial Period.

The course of climatic change during the Late-glacial and Post-glacial Periods is known in considerable detail from studies of fossil vegetation preserved in the deposits. Investigations were at first confined largely to leaves, seeds and fruits; in more recent years a close study has been made

of the fossil pollen grains abundantly preserved in peaty deposits. The grains are identified, their relative frequency at different levels counted, and hence a clear picture obtained of changing forest compositions. Pollen zones numbered from I to VIII have in this way been established for most of Europe. The changes of vegetation are of course not identical over wide areas, due to differences in latitude, but in spite of this a striking parallelism has been proved in many parts of the world. That the climatic changes which determine the boundaries between most of the pollen zones are synchronous has been shown by the technique of radiocarbon dating, whereby an absolute age can be assigned to samples of suitable organic material up to a maximum age of about 50,000 years.

From about 3,000 B.C. onwards in Europe the dating and correlation of Post-glacial deposits becomes particularly difficult. Climatic changes have been relatively slight; on the other hand human interference for agriculture becomes increasingly important, so that vegetational changes tend to be of local significance rather than of regional.

The Post-glacial history of the land and freshwater Mollusca in Britain appears to be broadly similar to that established for the flowering plants; in other words, as temperatures rise, artic- and boreal-alpine species disappear, and warmth-loving species move in. By the beginning of the Atlantic Period (zone VIIa), when Britain was cut off from the continental mainland, most of our species were already present. The most important changes since that time have been those produced by man. Woodland and marsh species have become increasingly rare and local, whereas many xerophiles and open country forms have prospered and spread. Also a number of species have been accidentally or deliberately introduced from abroad, to become familiar members of our fauna; notable among these is probably the common garden snail, Helix aspersa, unknown in this country from deposits of pre-historic age.

The appended diagram includes terms in common use for the subdivision of the Late-glacial and Post-glacial Periods, and shows the broad climatic and vegetational changes.

Additional Brief Note.

10. Whilst the compiler does not insist on typewritten material, he would appreciate that proper nouns and latin names be clearly printed to avoid errors arising in the course of printing, as his interpretation of the author's handwriting may differ from that of the latter - avoidance of such errors is the responsibility of the author.

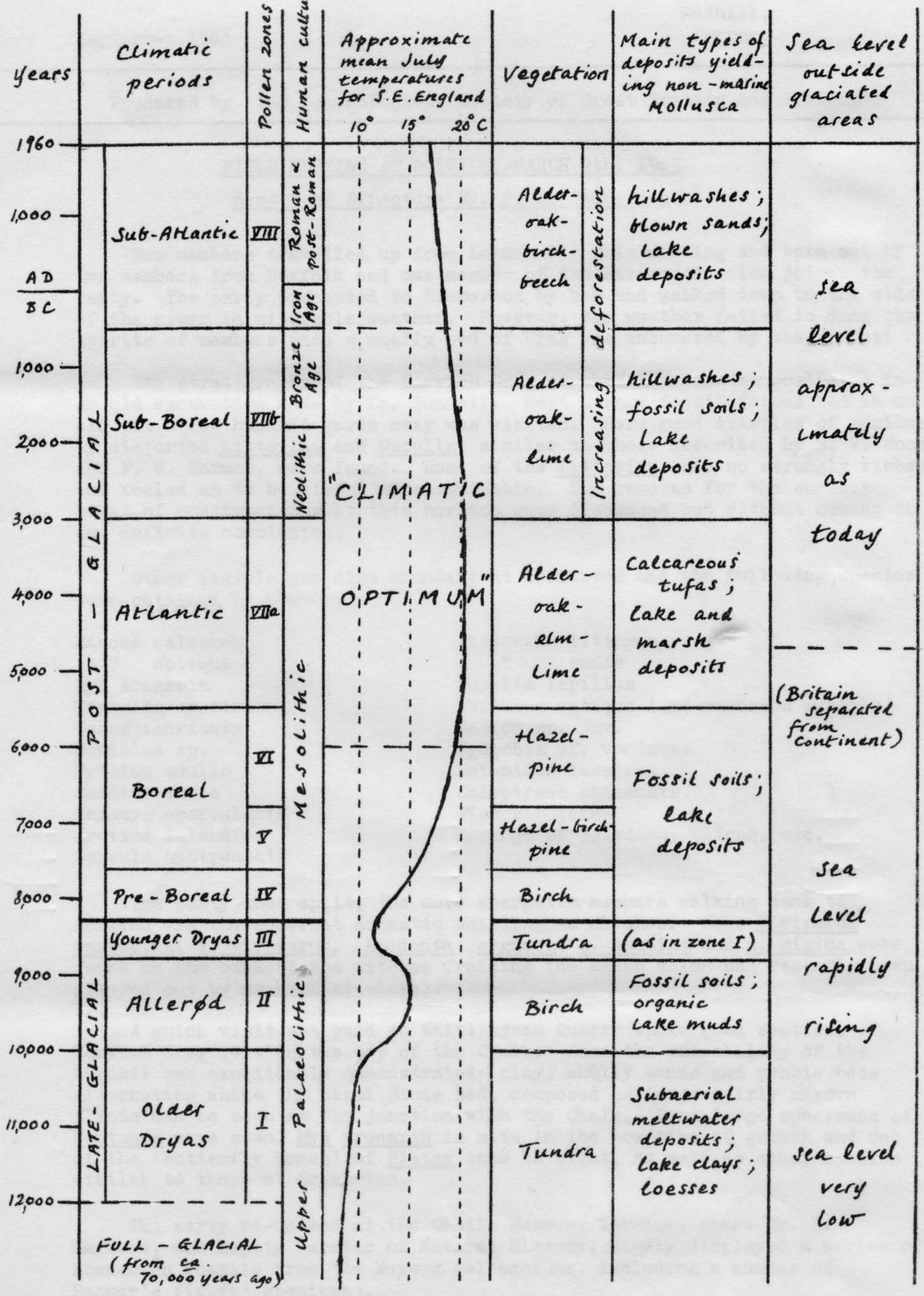

Chart for the Late-glacial and Post-glacial Periods, applicable mainly to Britain