IPSWICH GEOLOGICAL GROUP - Spring, 1970

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CONTENTS

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Stencils typed by P. Grainger.

CLACTON-ON-SEA, ESSEX, ARCHAEOLOGICAL EXCAVATIONS CONDUCTED BY THE DEPARTMENT OF ANATOMY, UNIVERSITY OF CHICAGO, BY PROF. RONALD SINGER AND MR. JOHN WYMER.

NOTES ON RESULTS OP FIRST SEASON: JULY-SEPTEMBER 1969.

Eleven cuttings (each 2 x 2 m.) were made along a line approximately North West - South East 90 m. long, across what was assumed to be the course of the buried Thames-Medway channel or channels of the Mid Pleistocene, on the basis of work conducted in 1934 by Oakley and Leakey. This line was sited in the rough ground covered by hawthorn scrub, north of the 9th fairway, at the Jaywick Sands end of the Clacton Golf Course. Permission for excavation was kindly granted by the Clacton Golf Club. Most of the cuttings were dug to a depth of about 2m., at which point the present water table was met. Five of the 2 x 2 m. cuttings joined together at the southern end to form a long trench, and this was extended by a larger cutting on its west side, 4.5 x 4.5 m.

A series of borings was made at 10 m. intervals along a line 260 m. long. This line was sited across the entire width of the channel or channels, at right angles to its assumed course, close to and parallel with the edge of the hawthorn scrub on the east side of the fifth fairway. At its southern end it was 60 m. west of the excavation line, and 20 m. west of the north end of the excavation line at the 10th borehole. These borings, plus additional ones made in the vicinity of the main cuttings, indicate that the general line extrapolated by Oakley and Leakey is correct. A major river channel, 160 m. wide, appears to have silted up with fine, shelly sand. Consequently, a narrow channel about 50 m. wide, meandered in a wide loop on the southern side, partially cutting into the aggradation of the major channel. A thin spread of clayey gravel exposed by excavation appears to represent a river beach on the lee side of the meander loop. This subsidiary channel silted up with a distinctive clayey marl which ultimately spread over the shelly sand filling the main channel. This marl is equated with the white or variegated marl of the 1934 sections, and may be broadly contemporary with the 'fine, dark grey loamy sand' at the base of the pollen sequence determined by Pike and Godwin from a borehole made in 1950, close to Nelson Road on Marine Parade West, Clacton. This would suggest a date in the latter part of the Hoxnian Interglacial for the formation, of these marls which preceded the estuarine series of deposits at Clacton.

Above the gravel beach exposed by excavation, the marl is about 0.60 m. thick, but thickens towards the centre of the subsidiary channel and overlies and interdigitates with shelly sand on the northern side. Both marl and beach gravel are banked against London Clay on the southern side, but the junction is confused by later soil movements. Brown, stony clay, overlying the marl, is similarly affected.

This disturbance is mainly restricted to the south bank and is not yet fully understood.

Archaeological material (stone artifacts and faunal remains) have been found:-

i) On and in the river beach gravel
ii) In the variegated marl
iii) In shelly sand on the north side of the subsidiary channel.
iv) In the mixed gravel, marl and clay at the south side of the subsidiary channel.

The great majority has come from the gravel (i) or the mixed material (iv). That in (iii) is restricted to a very few, small rolled flakes, rare pieces of micro fauna and large numbers of shells. Both bones and artifacts are rare in marl (ii) but are present and usually in fine condition.

Faunal remains have been mainly small and fragmentary. Numerous small amorphous mammalian fragments occurred but 19 are sufficiently complete to enable tentative identifications:

	Rhino	(Metapoidal)
	Bos	(teeth and long bone fragments)
	Clacton Fallow Deer	(antler fragment)
also	Bird	(broken long bone)
	Fish	(vertebra)
and	some micro fauna	

Stone artifacts comprise the characteristic flakes and cores of the Clactonian Industry. 237 flakes and 12 cores were recovered and of these 153 are in mint or sharp condition. These artifacts, on or slightly in the gravel of the river beach, are considered to be *in situ*; those in the marl may have been thrown in from a nearby site on the river bank, since destroyed or incorporated with the mixed gravel, clay and marl at the edge.

Samples of the marl were taken for examination by Dr. Charles Turner of the Botany School, Cambridge, and Mr. John Hollin of the Institute of Archaeology. None has yet produced sufficient pollen for analysis. Shells have been collected for study, Mr. David Peachey has collected samples for traoe minerals analysis and a specimen section has been removed, by Colchester Museum. The mint condition of many of the artifacts will allow useful studies of micro-wear to be made. Dr. Eric Robinson is examining samples for possible ostracods. Occasional traces of charcoal suggest that Clactonian Man may have been using fire.

A further area around the gravel beach 40 x 20 m. will be examined this year.

J. J. Wymer, M.A., F.S.A.

THOUGHTS ON PALAEOCARCINOLOGY

The following, rather prosaic passage, has been extracted from a collector's handbook, "British Fossils", by Dr J. E.Taylor, published in 1885 by Routledge, London:-

"In many English localities the fossil Crustacea are very beautifully preserved, and are unquestionably among the gems of the cabinet when properly worked out. In the Oolitic and Cretaceous rocks we have the well known generic type Eryon, not at all uncommon. The chalk of Hertfordshire has yielded to a friend of mine (who was geologically inclined, and wanted a 'hobby') a number of new forms of fossil crayfishes. The real fact was - they wanted hunting up. When the student has learned to recognise crustacean structure, and sees a bit of it cropping out in the chalk, he must work away with his pocket-knife and tooth-brush until the whole of the probably buried-up crustacean is developed. Chalk is a capital rock for allowing of this; the harder Oolitic limestone is not so easily persuaded to give up its dead.

"When we come to the Tertiary formations, especially to the Eocene - or rather, the London Clay representative of that interesting formation - the higher-developed fossil crustaceans are not uncommon, and, in some places, even plentiful. The London Clay of the Isle of Sheppey is a sort of crustacean cemetery. How abundant they are may best be stated by saying that Sheppey fossil lobsters may be bought in the Strand geologist's shop for six-pence each - a good deal cheaper than the price of the recent lobsters in other shops, a door or two away.

"Still, at Sheppey, and elsewhere, these fossil crustaceans have to be dug out of the clay, or else the collector takes advantage of the weather and the waves having washed them out of exposed cliffs.

"In Suffolk we are very advantageously placed in this respect. The weather and the waves washed all the harder Eocene fossil Crustacea out of the London Clay, perhaps during the Eocene period, and they were collected together in hollows and other protected places. The area these fossils occupied subsequently became a sea floor, and the old derivative fossil crustaceans were thus covered up by the dead shells of a later period, and were even subjected to the indignity of having their petrified corpses made use of as settling places for Red Crag barnacles (Retrograde representatives of the class of which they were aristocrats !)

"Anyhow, you can get any number of fossil crabs and lobsters Brachyura, Anomoura, and Macrura - in the heaps of phosphatic nodules collected together and awaiting carting in the neighbourhood of the "coprolite" pits about Ipswich and Felixstowe. The commonest of the fossil crustaceans are Xanthopsis, Thenops, Zantholites, Hoploparia, Archaeocarabus, Dromliites (possibly a fossil hermit crab), etc. Some of these derivative specimens are very perfect, others are waterworn; but all are imbedded in what was once a phosphatic paste. Singularly enough, marine phosphate deposits are frequently remarkable for their fossil crustaceans; as, for instance, the Greensand "coprolites" of Cambridgeshire, where we have an abundance of the carapaces of Notopocorystes."

The apparent ease whereby fossil crabs and lobsters could, be collected obviously reflects upon conditions prevailing at the time this extract was written. There were, however, far more exposures, particularly of the Cambridge Greensand and the Red Crag Box Stones, and far fewer geologists in 1885 than there are today. And the pits, worked almost entirely by pick and. shovel, allowed the quarry-men ample time to spot specimens and to put them aside for collectors, many of whom purchased and relied solely upon this method for forming collections of fossils.

Coastal exposures, too, presented better opportunities. For example, the building of the railway retaining wall along part of the Warren at Folkestone has since affected the natural slumping (or rather, ‘squeezing’) of the Gault, with the result that the once famous exposure has become largely sanded over. Groins and other coastal defences have of times resulted in similar coverages, and coastal erosion, as in the neighbourhood of Felixstowe, has occurred to such an extent that complete sections known to collectors of Taylor's day, no longer exist.

Reed, when discussing (1897) the formation of ‘coprolites’, or, correctly, phosphatic nodules, in the Cambridge Greensand, states that they were formed, by calcium phosphate being deposited from suspension around suitable nucleii, e.g. the remains of dead organisms on the sea floor and overrules the theory that such organisms were embedded in a phosphatic paste after deposition of the beds. Even by the early 1900fs the 'coprolite1 pits in the Cambridge Greensand were greatly reduced in numbers. The reason, it appears, was the importation of calcium phosphate from Belgium and America, and lack of demand caused by an agricultural depression. Today there is probably only one locality, Barrington, Cambs., where Cambridge Greensand may be seen and fossils of any description are very scarce.

Both Bell (1862) and Carter (1898) remarked upon the abundance of decapods in the Cambridge Greensand and listed some 16 species from that deposit. Where some of these have proved synonymous and most are known from other deposits, others - particularly Eucorystes carteri McCoy and Enoploclytia tuberculosa (Bell) - are peculiar to the Cambridge Greensand. Recent discoveries, both above and below this deposit, have led to closer scrutiny of the surviving collections producing such exciting results as types of new crab species being selected from material available for study for seventy years.

Taylor has implied that the genus Eryon extended into the Cretaceous, but at no time were Cretaceous macrurans referred to that genus. In 1885 the highest recorded species of Eryon appears to have been E. stoddarti (Woodward) from the Stonesfield Slate. No mention can be traced in Woods' Monograph (1930) of the 'new forms of fossil crayfishes' from the Chalk of Hertfordshire, indicating that the specimens did not reach the hands of specialists, or as is more probable, proved to be examples of known species, perhaps of Enoploclytia. Regretably, Woods does not mention any Hertfordshire localities at all.

A number of lobster-like forms collected from the Chalk towards the end of the last century are to be found in museums; the Brighton Museum, for example, houses a finely preserved suite (the Willett Collection) of Enoploclytia and other macruran species. All are superbly developed, showing the use of great skill and patience. In no case could they be described as common, particularly when the number of years it has taken to accumulate them is considered.

Coming to the London Clay (particularly of Sheppey) decapods are indeed commonly found, but certainly not in such numbers to warrant the mass-internment conjured by the term 'crustacean cemetery'! The impression given is that specimens were easier to obtain from the cliffs rather than by gleaning the beach. The slumped and eroded condition of the Sheppey cliffs today, permits few opportunities for collecting in situ. And even in the past 10 - 15 years the beach, cluttered with the debris from fallen pill-boxes and other bric-a-brac, to say nothing of tons of pebbles from an eroded pocket of Pleistocene drift, has severely hampered collecting conditions. Before it became flooded, the exposure of Upper London Clay (Wrigley's Bed 5), worked by the Oxshott Brick and Tile Co., Surrey, yielded far more crabs per time spent, than I have ever experienced at Sheppey. The majority came from large septarian nodules, which while ringing a curse from the quarry-men, were a delight to the collector. Five brachyuran and one macruran species were recorded from that locality, but just as the potentialities of the pit were realised, it became defunct !

Perhaps the finest collection of derived London Clay decapods is preserved in the Ipswich Museum. The curious thing about all these derived remains is the highly glossy surface and iron stained patina. As Taylor remarked, many of the specimens are very well preserved, some showing features not always present on similar species taken from the original matrix. Such finds, however, are becoming rare, although the occasional Box-stone enclosing a crab is still to be found. The Ipswich Museum also contains a remarkable example of the rare Pliocene crab Maja verrucosa M-Edwards, now a Mediterranean species. Other species from the Crags include M. squinado (Herbst), Cancer pagurus L., Carncer maenus L., Ebalia spp., Portunus spp., and Pagurus bernhardus L. In fact, a goodly number of the species inhabiting the waters around our shores today.

Taylor's remark about properly worked out specimens becoming 'gems of the cabinet' cannot pass unsupported, although now we need to know a good deal more about our specimens than satisfied the Victorian collector of curios and very often odd bits are equally cherished. Where the species is fairly common and there is a wealth of literature, identification is easy. The fun starts when a suspected 'sp. nov.' comes to light, as generally happens when something unfamiliar in the excitement of the chase. But, alas, these all to often prove to belong to a rare species described and often appallingly illustrated in obscure publications. A case in point concerns a crab I knew first from the Lower Gault of Westerham, Kent. Having exchanged a Death's Head Hawk Moth for it, I labelled it Homolopsis edwardsi Bell. Later, when I had indisputable evidence of that species and access to more literature, I excitedly re-labelled the specimen, Homolopsis depressa Carter - a much rarer species. It was at this stage that I left it together with two others from the Upper Gault (at that

time comprising the only known specimens in the country) on top of a bus and spent a frantic evening on their recovery! At a suggestion an Australian publication, describing Dioratiopus (J. Woods, 1953) was consulted. It was apparent that our specimens belonged to a new species of an Australian genus. Now we were getting somewhere, and labels were revised accordingly. Research among homolosids continued and a similarity between our 'new species' and 'H.' spinosa van Staelen became apparent. And so, after some ten years, the status of this crab was finally resolved - Dioratiopus spinosus (van Straelen). But, I was assured, the labels in one collection (where the crab had gained the nom-de-plume Fred sarsparella) would remain unaltered. It appeared that this sceptisism was well founded, for the story was to continue .... doubts arose, literature and evidence in the light of new finds were re-examined . . . . Dioratiopus was quietly forgotten and a new genus (in MS) erected.

Incidently, I've spent many enjoyable hours during the late 1940's in what was probably the same Strand Geologist's shop and no doubt many naturalists remember the sign of the Swallowtail Butterfly above the entrance to Watkins and Doncaster's establishment by Charing Cross Station (before they removed to Bexley, Kent). No fossil lobsters were offered for sale then, although several species of recent crabs were purchased - but for far more than sixpence!!

REFERENCES

Bell, T.	1862	A Monograph on the fossil malacostracous Crustacea of Great Britain. Gault and Greensand. viii +-40, 11 pls. Palaeontograph. Soc. London.
Carter, J.	1898	A contribution to the palaeontology of the decapod Crustacea of England. Q.J.G.S. 54, 15 - 44, 2 pls.
Reed, F. Cowper.	1897	A handbook to the geology of Cambridgeshire.
Woods, H.	1922-29 (1925-31)	A monograph of the fossil macrurous Crustacea of England. Mon. Palaeontograph. Soc, London.
Woods, J.T.	1953	Brachyura from the Cretaceous of central Queensland. Queensland Mus. Mem. v.13, p.50-57.

J. S. H. Collins.

NOTES ON EARLY SCIENTIFIC SOCIETIES IN IPSWICH

IPSWICH PHILOSOPHICAL SOCIETY

Believed to have existed from 1818 to 1854.

IPSWICH SCIENCE GOSSIP SOCIETY

- 9 April 1869 - a meeting held at the residence of Dr. H. P.Drummond; it was determined to form a Society to excite more interest in the study of natural History, Science, Geology, and Archaeology. The Museum Committee granted them the use of a room for meetings at the Old Museum (in Museum Street).
- May I869 - first meeting; Mr. Charlesworth gave a description of the collection of Red Crag fossils given to the Museum by Mr. Edward Packard (the Mayor).
- Two months later - Mr. H. Miller succeeded as Secretary, and held post for 21 years.
- 1869 - one field day in first year, - excursion to the Oyster Grounds of the Orwell Fishery Company at Shotley.
- 25 Nov. 1870 - first Conversazione held, at Ipswich Town Hall. 400 tickets sold at 1s-0d.
- 1872 - third Conversazione, at Public Hall; 65O tickets sold at 1s-6d.
- 1873 - Mr. (later Dr.) J. E. Taylor gave his first paper to the Society, on "Flint Implements".
- 1875 - proposal to change name to the Ipswich Scientific Society carried by 23 votes to 19.

IPSWICH SCIENTIFIC SOCIETY

- Nov. 1875 ~ Dr. W .B. Carpenter lectured on the Challenger Expedition and Deep Sea researches; This meeting was thrown open to the public.
- Easter 1877 - the Society took an active part in arranging the Geologists Association of London visit to Ipswich and district; Whittaker, Taylor and Charlesworth acted as guides.
- A visit was paid, to the deep well boring at Harwich, and the cores examined; Felixstowe was then visited, the party travelling back by the Railway then in the course of construction. After dinner at the Golden Lion, the party adjourned to the Museum to examine the Geological specimens.
- The next day's excursion was to Butley, Chillesford, Sudbourne and Orford; Sir Richard Wallace entertained the party to Luncheon, in the Keep of Orford Castle.
- 5 Dec. 1877 - the Society introduced the telephone to Ipswich.
- 1878 - subscription raised to 5s-0d.
- 1881 - the new museum (High Street) opened.
- 1 Sept. 1883 - Geological field day to Felixstowe Cliff; leader, Dr. Taylor. Followed by lobster tea at the Golf Course Martello Tower.
- 3 May 1884 - excursion to Colchester district a few days after the Earthquake of that year; £2-2s-0d voted to the Relief Fund from the Society
- 22 Aug. I885 - excursion to Brandon (flint investigation).
- 1886 - visit to Blakenham Chalk Pits.
- May 1887 - various sections formed for special work, - Botany; Entomology; Geology (under Dr. Taylor).
- 1890 - visit to Walton-Naze (with Geologists Association of London, and Essex Field Club).
- June 1890 - joint meeting with Essex Field Club, - Dredging Excursion organised on the Rivers Orwell and Stour. 1891 - second joint excursion with the Essex Field Club to the Orwell and Stour.
- Feb. 1893 - Dr. Taylor gave a paper on Coal Boring in East Anglia.

- Sept. 1895 - The British Association for the Advancement of Science met in Ipswich.
- 1896 - the Society decided to establish a Meteorological Station; the Museum registered as Headquarters.
- Feb. 1898 - the Society organised one of the most successful Lectures ever given in Ipswich when they engaged Fridjoff Nansen immediately after his return from the North Pole.
- May 1899 - Wireless Telegraphy used to transmit messages from the Curators' office in the Museum to the Art Gallery.
- Feb. 1912 - joint meeting with Prehistoric Society of East Anglia; Mr. J. Reid Moir lectured on "The Occurrence of a Human Skeleton in a Glacial Deposit at Ipswich."
- March 1917 - at this meeting, Mr. F .Woolnough exhibited a piece of bath stone which had fallen from one of the windows of the Museum, and which showed some interesting fossils.
- April 1918 - Mr. Reid Moir lectured on "Early Man"; this was one of the lantern lectures for young people, arranged by the Society.
- Jan. 1921 - decision taken to include Lady Members.
- Jan. 1924 - amalgamated with Ipswich and District Field Club to form the Ipswich and District Natural History Society.

IPSWICH AND DISTRICT FIELD CLUB

- 1903 - formed, for Natural History interests, and Rambles.
- 1908 - first Journal produced.
- Dec. 1912 - "At Home"; three brief lectures, with refreshments served by the Ladies' Committee. April 1920 - Miss N. Layard talked on the "Stoke Bone Bed", describing 'working in wet clay, fifteen feet down, with an umbrella in one and a knife to excavate with in the other'.
- Jan. 1921 - annual subscription increased from 2s-0d to 3s-6d.
- June 1921 - J. Reid Moir led a fieldtrip (in which the Ipswich Scientific Society also took part) to the Henley Road Brickfields.
- June 1922 - visit to the Foxhall Hall crag pit, led by J. Reid Moir.
- Jan. 1924 - amalgamated with Ipswich Scientific Society to form the Ipswich and District Natural History Society.

IPSWICH AND DISTRICT NATURAL HISTORY SOCIETY

- Jan. 1924 - formed by the amalgamation of the Ipswich Scientific Society and the Ipswich and District Field Club. Mr. J. Reid Moir was first President of the new Society.

FURTHER HEADING

"Ipswich Scientific Society", Lecture MS by F. Woolnough, Ipswich Museum. Ipswich Scientific Society Photograph Album, Ipswich Museum.
Journal of the Ipswich and District Field Club.
Journal of the Ipswich and District Natural History Society.
Ipswich Journal. East Anglian Daily Times.
Proceedings of the Geologists Association. Essex Naturalist.
Proceedings of the Prehistoric Society of East Anglia.

(These notes formed the basis of a talk given to a meeting of the Ipswich and District Natural History Society and the Ipswich Geological Group).

R. Markham.

INTRODUCTION TO THE MULL LEAF BEDS OP SCOTLAND.

Sediments associated with the Tertiary Igneous Activity of the Isle of Mull and certain other areas have yielded a warm-temperate fauna generally accepted are of Eocene age. The flora consists almost entirely of leaves and pollen. There is an almost complete absence of fruits, seeds, and animal remains.

The plants include:-

Ginkgoaceae	- Ginkgo.
Coniferae	- Podocarpus; Cryptomeria.
Dicotyledons	
Betulaceae	- Corylus.
Magnoliaceae	- Magnolia.
Hamamelidaceae	- Hamamelia
Platanacea	- Platanus.
Cornaceae	- Cornus.

Some Monocotyledons, and several other families of Dicotyledons, have been recorded; Also Algae (a red alga), Fungi, Filices (Onoclea), Equisetales, and Insects.

It is believed that the following list gives all the important palaeontological literature on these little known deposits.

1819 MacCulloch.	"A Description of the Western Isles of Scotland." London (Vol.i, p.568).
1851 Duke of Argyll	"On Tertiary Leaf-Beds in the Isle of Mull." Quart. Journ. Geol. Soc. vol.vii, pp.89-103.
1885 Koch, W.S.	"Notes on Mull and its Leaf-beds." Trans. Geol. Soc. Glasgow, vii, 52.
1886 Gardner, J.S.	"Monograph of the British Eocene flora" vol.2, Palaeontogr. Soc. Monograph.
1887 Gardner, J.S.	"On the Leaf-Beds and Gravels of Ardtun, Carsaig, etc. in Mull." Quart. Journ. Geol. Soc. vol.xliii, pp.270-300.
1924 Seward, A. C. & Holitum	"Tertiary Plants of Mull," in Bailey, E. B., "Tertiary and post-Tertiary geology of Mull, Loch Aline and Oban." Mem. Geol. Surv. Scotland.
1933, 1935 and 1936. Johnson, T.	Memoirs and Procs. Manchester Lit. and Phil. Soc., lxxvii, no.8; lxxix, no.7; lxxx, no.3. (specimens from Mull described, and assigned to Platanus, Quercus and Cunninghamia)
1934 Johnson, T.	Brit. Assoc. Report (Aberdeen Meeting), 388. (account of the Mull and Canna floras
1936 Simpson, J. B.	"Fossil Pollen in Scottish Tertiary Coals." Proc. Roy. Soc. Edinb. 56, 90-108.
1937 Johnson, T.	"Notes on the Tertiary flora of Scotland" Trans. Edinb. Bot. Soc., 32, 291-340.
1942 Tomkeieff, S. I. & Blackburn, K. B.	"On the Remains of Fossil Wood enclosed in a Tertiary Lava on the Island of Rum, Inner Hebrides." Geol.Mag., vol.lxxix, pp.14-17.
1961 Simpson, J.B	"The Tertiary pollen-flora of Mull and Ardnamurchan." Trans. Roy. Soc. Edinb., 64, 421-468.
1961 Richey, J. E., MacGregor, A. G. & Anderson, F. W.	"Scotland; Tertiary Volcanic Districts." Brit. Regional Geol., H.M.S.O.

R. Markham

A COLLECTION FROM THE OLD CRAG PIT AT STRATTON HALL, LEVINGTON

The following faunal list is of specimens collected from the now obliterated old crag pit at Stratton Hall, Levington (GR - TM 247383) between 1955 and 1957, when the writer was at school. The names have been updated in some cases. The section showed gravel and sand on fairly hard Red Crag.

SPONGE		ECINOIDS	
	Cliona sp.		Echinocyamus pusillus
BRYOZOA			'Cidaris' claviger
	'Cellepora' sp.		'C.' sp.
	Trigonopora sp.	WORM	
	Fascicularia sp.		?Serpula sp
BRACHIOPOD		VERTEBRATES	
	Terebratula sp.		Ray teeth
ARTHROPODS			Shark teeth;-
	Crab claws		Odontaspis spp.
	Barnacles (spp.)		Squatina sp.
CORALS			Wolf-fish teeth
	Balanophyllia calicula		Sting-ray sting
	Sphenotrochus intermedia		Bone fragments
	?Paracyathus caryophyllus	GASTROPODS	
BIVALVES			Neptunea contraria
	Arca lactea		N. despecta
	Glycimeris glycimeris		Nucella lapillus
	Ostrea edulis		N. incrassata
	Pycnodonte cochlea		N. tetragona
	Macoma obliqua		Trophon clathratum
	M. praetenuis		Ocinebra tortuosa
	Tellina benedenii		Searlsia costifera
	Gastrana laminosa		Sipho curtus
	Cardium edule		Buccinum sp.
	C. parkinsoni		Liomesus dalei
	C. angustatum		Natica multipunctata
	C. interruptum		Lunatia catena
	Ensis siliqua		Polinices hemiclausa
	Mytilus edulis		Scaphella lamberti
	Panopaoa faujasii ?		Turritella incrassata
	Pholad sp.		T. imbricataria
	Cardita senilis		Potamides tricinctus
	C. scalaris		Nassa reticosa
	C. corbis		N. propinqua
	Venus casina		N. granulata
	V. imbricata		N. labiosa
	V. fasciata		Melampus pyramidalis
	Astarte omalii		'Pleurotoma' sp.
	A. basterotii		Raphitoma sp.
	A. obliquata		Lacuna? sp.
	A. burtini		Calliostoma sp.
	A. gracilis		Gibbula sp.
	Lucina borealis		Scalaria spp.
	"Tapes" sp.		Trivia coccinelloides
	Dosinia exoleta		Capulus sp.
	Arctica islandica		Fissurella? sp.
	Pygocardia rustica		Cylichia sp.
	Pecten maximus		Tectura virginea
	Chlamys opercularis		Calyptraea chinensis
	C. harmeri		Emarginula reticulata
	C. tigerina		Spisula constricta
	C. dubia		S. ovalis
	Lutraria sp.		S. arcuata
	Corbula sp.		Mya arenaria
	Corbulamya complanata		Inoceramus sp.
SCAPHOPOD			Gastrochaenia dubia
	Dentalium sp.	CEPHAL0P0D	
			Belemnites

Notes on fauna ; —

Two shells of "zonal" interest, Macoma praetenuis and Spisula constricta were represented by one specimen each.
Capulus hungaricus and Diplodonta astartea were represented by specimens in C. Allen's collection (seen by author).

R. Markham.

LIST OF FOSSIL HOMINID SITES

Sites of fossil Homo sapiens s.s. (i.e. Homo sapiens sapiens) are not induced. Oreopithecus is excluded, also Gigantopithecus (now known to be an ape). Ramapithecus (and syns.) and Propliopithecus are included as hominids. The number of specimens per site is not listed; the nomenclature and affinities of the specimens is not here regarded as of prime importance; certain information needs checking. Extracted from various sources.

PROPLIOPITHECUS

EGYPT

Fayum, S.W. of Cairo. Oligocene

RAMAPITHSCUS

INDIA

1932 Siwalik Hills. Pliocene (= Bramapithecus)

KENYA

1962 Fort Ternan Miocene (= Kenyapithecus)

AUSTRALOPITHECINES OP SOUTH AND EAST AFRICA

BOTSWANA

1924 Taung

SOUTH AFRICA

1936-57 Sterkfontein
1938-41 Kromdraai
1947-62 Makapansgat
1948-52 Swartkrans

TANZANIA

1959 Olduvai, Bed I (= Zinjanthropus)
1964 Peninj, Lake Natron

The Taung, Sterkfontein, and Makapansgat specimens are classified as Australopithecus africanus and are of Upper Villafranchian (Lower Pleistocene) age.

The Kromdraai, Swartkrans, and Tanzanian specimens are classified as Paranthropus robustus (also other names), and are of Upper Villafranchian (Olduvai) and of Middle Pleistocene ages.

HABILINES OF EAST AFRICA

TANZANIA

1960 Olduvai, Bed I Homo habilis)

There is some controversy over the validity of separating the habilines from the australopithecines.

The Olduvai culture is associated with H. habilis.

OTHER AFRICAN AUSTRALOPITHECINES, HABILINES, & RELATED FORMS

SOUTH AFRICA

1949 wartkrans 'Telanthropus' Mid. Pleistocene
- possibly an australopithecine or pithecanthropine.

TANZANIA

1939	Garusi, Lake Eysai	'Meganthropus'	Upper Villafranchian
		- possibly an australopithccine.	
1963	Olduvai, Lower Bed II	"Homo habilis'	End of Villafranchian
		- has been suggested is an australopithecine	

KENYA

1932	Kanam	- affinities uncertain.

CHAD

196I	Koro Toro	- possibly a habiline.

ETHIOPIA

-	Omo Valley	- recent finds, still to be decribed.

It is possible that 'Telanthropus', the Olduvai Bed II habilis (the later habiline), the Djetis age pithecanthropine from Sangiran (Java) (the early pithecanthropine), and perhaps the Koro Toro specimen, all belong to the same structural grade.

PITHECANTHROPINES PROM THE FAR EAST

JAVA

1890	Kedung Brebus
1891	Trinil
1936	Modjokerto
1937	Sangiran
1939	Sangiran

These finds, now generally referred to Homo erectus, are of Middle Pleistocene age. The Modjokerts and 1939 Sangiran finds are slightly older (Djetis age) than the others, and have been called P. robustus

CHINA

1927-64	Choukoutien
1963	Lantian

The Chinese finds are of Middle Pleistocene age. There seem to be similar finds from other localities (not given above).

'MEGANTHROPUS' FROM JAVA

JAVA

1941-52	Sangiran	- This 'Meganthropus' may be an australopithocine, a habiline, or a pithecanthropine.

PITHECANTHROPINES OP AFRICA AND THE NEAR EAST

ALGERIA

1954-55	Ternifine

MOROCCO

1933	Rabat
1954	Sidi Abdurrahman, Casablanca
?1958	Teraara, Rabat

Ternifine and Casablanca have been called Allanthropus; they are of Middle Pleistocene age, and associated with Acheulian implements.

Rabat and Temara may be pithecanthropines.

TANZANIA

1960	Olduvai, Upper Bed. II. Middle Pleistocene	
		- associated with Chellean culture; ?pithecanthropine, but has been compared with Steinheim and Broken Hill skulls.

ISRAEL

1959	Tell Ubeidiya	
		- may be pithecanthropine; has been called an australopithecine.

EARLY HOMINIDS OF EUROPE

GERMANY

1907 Mauer (Heidelberg) Gunz-£findel, or Mindel.
- affinities uncertain; may be pithecanthropine
1933 Steinheim Hoxnian

BRITAIN

1935-55 Swanscombe, Kent Hoxnian. Acheulian implements

FRANCE

1947 Fontechevade, Charente Eemian
1949 Montmaurin, Haute Garonne.

The relationships of the above hominids is obscure; they maybe early neanderthaloids, and have been claimed as early sapiens.

HUNGARY

1964 Vertesszöllöz, near Budapest. Mindel.
- possibly an early sapiens; has been claimed as pithecanthropine.

NEANDERTHALERS OF WESTERN EUROPE

BELGIUM

1830 Engis, Liege.
1866 La Naulette, Namur.
1886 Spy, Namur
1895 Bay-Bonnet, Liege

FRANCE

1888-89 Malarnaud, Ariege
1895 Isturits, Basse-Pyrenees
1907- 08 Le Petit Puy-moyen, Charente
1908 La Caapelle-aux-Saints, Correze
1908 Le Moustier, Dordogne
1908- 21 La Quina, Charente
1909- 21 La Ferrassie, Dordogne
1909 Pech de l'Aze, Dordogne
1934 Marillao, Charente
1945-46 La Verrerie, Gard
1949 Arcy-sur-Cure
1949-51 La Chaise, Charente
1951 Monsempron; Lot-et-Garonne
1955 Genay, Cote d'Or
1958 Regeurdon, Dordogne
Combe grenal

GERMANY

1856 Neanderthal
1887,92 Taubach, Weimar
1908-25 Ehringsdorf, Weimar
1912-13 Neussing
1956 Melsungen

GIBRALTAR

1848 Forbes' Quarry
1926 Devil's Tower

ITALY

1929,35 Saccopastore, Rome
1939-54 Monte Circeo, Latina
1955 Bisceglie, Bari
1956 Sedia del Diavolo, Rome
1958 Capo di Leuca, Puglia
1959-61 Pofi, Cava Pompi

JERSEY

1910- 11 La Cotte de St.Brelade

SPAIN

1887 Banolos
1928 Cova Negra
1954-55 Pinar (La Cariguela), Granada

SWITZERLAND

1955 St.Brais

The above are the ‘classic' Neanderthalers (Homo neanderthalensis; Homo sapiens neanderthalensis).

The majority are of Wurm age and associated with Mousterian industry; a few (e.g. Ehringsdorf) are of Eemian age, and should possibly have been classified -under ‘Early Hominids of Europe’.

Neanderthalers (from Western Europe) and Neanderthaloids may be regarded as sub-species of Homo sapiens; their affinities are not gone into here. All seem to be of Upper Pleistocene age. Some of the Neanderthaloids from Eastern Europe and the Near East seem to be true Neanderthalers.

NEANDERTHALOIDS OF EASTERN EUROPE AND THE U.S.S.R.

CZECHOSLOVAKIA

1880 Sipka, Moravia
1905 Ochoz, Moravia
1926-56 Ganovce, Slovakia
196I Sala, Moravia

GREECE

1939 Petrolona, Thessalonika

HUNGARY

1932 Subalyuk (Mussolina), Bukk Mts.

ROUMANIA

1923 Ohaba-Ponor, Transylvanian Alps

TURKEY

- Karain Adala

U.S.S.R.

1924 Kuk Koba, Crimea
1938 Teshik-Tash, Uzbekistan
1952 Staroselje, Crimea

YUGOSLAVIA

1899-1905 Krapina, Zagreb
1961 Ivanec

NEANDERTHALOIDS OF THE NEAR EAST

ISRAEL

1925 Mugharet el-Zuttiyeh, Galilee
1928 Shukbah, Jerusalem
1929-34 Mugharet et-Tabun, Mt. Carmel
1931-32 Mugharet es-Skhul, Mt. Carmel
1933-35 Jebel Kafzeh, Galilee
196I Lake Tiberius cave, Amud

LEBANON

c.1900 Grotte d’Antelias
1947 Ksar'Akil, Beirut

IRAQ

1953-60 Shanidar

IRAN

1949 Bisitun, Kermanshah
1949 Tamtama, Rezaiyeh

NEANDERTHALOIDS OF NORTH AFRICA

CYRENAICA, LIBYA

1952-55 Haua Fteah

MOROCCO

1939 Mugharet el-'Aliya, Tangier
1952 Taforalt
1961 Jebel Irhoud, Marakech

ABYSSINIA. ETHIOPIA
1923 Dire-Dawa
Specimens from Rabat and Temara (see under ‘Pithecanthropines of N. Africa’) have sometimes been, classified as Neanderthaloids.

NEANDERTHALOIDS OF SOUTH AND EAST AFRICA

SOUTH AFRICA
1947 Makapansgat
1953 Saldanha Bay (Hopeficld)
ZAMBIA
1921-25 Broken Hill
TANZANIA
1935 Eyasi

NEANDERTHALOIDS OF THE FAR EAST

CHINA
1922 Sjara-Osso-Gol Ordos
1954 Ting-T’ sun Shansi
1958 Ma-pa, Kwangtung

JAVA
1931-33 Ngandong, Solo Valley.

R. Markham.

"MIGMA AND MAGMA"

It was Christmas Eve; Joe Geologist sat in a comfortable chair in front of a roaring fire, a tankard of ale at his side, on his lap a copy of the latest (authoritative) publication by Professor Daniel X Molasse on "The Structural Significance of the Granite Molecule in the Deposition of the Continents by Convection". Whether it was the effect of the beer, the fire or the Professor’s well known literary style, he could not remember, but his attention wandered and he stared thoughtfully into the fire. Suddenly, there was a faint pop, two bright flashes of light, and out of the fire appeared two tiny men, dressed, in very odd clothes. Speaking in unison, they said "We are Migma and Magma. You have been elected by the Geological Council of the Trolls, Niebelungs and Troglodytes as 'Geologist of the Year’. Your prize is one geological-type wish".

"Well, well" said Joe, "who'd have thought it?! Now let me see, what shall I ask for?" He sat for a moment looking at his strange visitors. Migma’s clothes were banded pink, grey and black, with a diffuse pattern of Potashions. Magma's garments on the other hand were patterned with triangular diagrams, eutectic and melting-point curves, interspersed with crucibles of boiling magma. This gave Joe an. idea; "I should like to be shown exactly how granites are formed", he said.

(cont.)

This produced a moment of dead silence, then a violent argument broke out between Migma and Magma. Joe couldn't follow it properly but it seemed as though there was a violent disagreement about how this request was to be carried out. When it seemed as though they were near to blows, Joe said "O.K., fellows, break it up: if you can't agree, you had better both show me one at a time and I'll be the judge". This calmed the two beings down and they set to work.

Magma removed his hat (which Joe now noticed was shaped like a volcano), and, after throwing some lumps of basalt ("from the Sima", he explained), he started to chant an incantation, which ended up -

Boil and Bubble, Potion Subtle
Bowen, Harker, Tilley, Tuttle.

Smoke and steam now rose from the hat and with a flourish, Magma poured out a stream of molten rock, which solidified as it hit the floor. “Granite" he proudly proclaimed. Joe looked at it carefully; it was undoubtably a granite, and he looked suitably impressed. He looked at Migma, who had been standing by with a sneer on his face during the performance; "Now it's your turn”.

Migma's preparations were equally simple. Into his hat (pluton-shaped), he put; chunks of quartzite, schist and conglomerate, and, under the hat he placed on a small bottle labelled "Granitising Fluid", together with a bottle of water and a jar of silica gel - "For the Wets and the Drys" - he explained. Then he started his incantation, which ended up-

Ichors, Juices, do your deed
Reynolds, Backlund, Brammall, Read.

A dark mass now started to spill over the edge of the hat, described by Migma as the Basic Front. When this ceased, Migma turned the hat upside down with a flourish and with a faint clunk' out fell a lump of rock onto the floor. “Real Granite", he announced with a contemptuous look at Magma.

"Nonsense", the other replied, and., in. a moment, the argument was raging fiercely again. This time, Joe failed, to make himself heard and the dispute grew hotter and hotter. Smoke and fumes began, to rise from the contestants, which explains why Joe failed to see who started to fling rocks about. As he vainly tried to see what was going on, a chunk of rock sailed through the air and caught him neatly behind the ear. Everything went blank, and when he came to, there was no sign, of anything unusual having happened, not even a burn on the carpet. The only trace of his odd experience was the two lumps of granite which lay on the floor - one was magmatic, the other metamorphic. The only snag was, that he couldn't tell one from the other. "Ah, well, it just goes to show!”

D. Whitten.

(Reproduced from the Kingston Polytechnic Geology Club Newsletter No.67 (Dec.1969), by kind permission of the author.)

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R. M.

ALDEBURGH - BEACHCOMBING

Aldeburgh beach is built of shingle, tidal drift moving the material from north to south. South of the town is one of the finest spreads of shingle in the Kingdom, forming the cape of Orford Ness, and diverting the River Aide to the south

The shingle consists mainly of flint pebbles, most of which are of East Anglian origin. Other stones may be found, some having been brought from the Pennines and even from Norway, by ice-sheets during the Ice Age.

Identification of beach pebbles can be difficult or impossible if the stone is very small, is deeply weathered, or show no structures or minerals visible to the naked eye. Waterworn man-made material (e.g., glass, brick) can be confusing!

Look out for: -

Flint - grey, black, brown; chert is a similar stone.

Quartz - colourless and. clear when pure, but many coloured varieties exist.

Chalcedony - a mixture of crystalline and amorphous silica,

with a large number of varieties, based on colour, such as –

Carnelian - reddish.

Agate - showing marked, colour banding.

Ironstone - stones with high content of iron compounds.

Conglomerite - consolidated pebble accumulations.

Quartzite - made of waterworn grains of quartz.

Igneous rocks - consolidated from molten, material; e.g., granite, lava

Metarnorphic rocks - rocks altered, by high temperature and/or strong pressure: e.g., schist, with parallel alignment of the constituent minerals.

Amber - fossil resin, i.e., gum extruded from coniferous trees; rare!

Coralline Crag - the local bedrock, a soft limestone with fossil shells and polyzoans (‘sea-mats’)

Modern (Recent) material, e.g., polyzoans ('sea-mats'), shells, bones (mainly fish), egg-cases of whelks and skate-fish.

(These notes were originally made for a meeting of a natural history society, co-led by the author.)

R. Markham

NOTES TAKEN PROM 'Current Trends in Paleobotany” by C. A. Arnold’ in 'Earth-Science Reviews’ Vol.4, No.4, Dec.1968 (published by Elsevier, Netherlands).

USE OF CUTICLES IN PALAEOBOTANICAL RESEARCH

Cutinisation is the impregnation of cell walls and covering of the surfaces of organs with cutin during development; this material is extremely resistant to decay. New techniques enable cuticular characters to be used in taxonomy, this being particularly useful in identifying detached organs of plants.

PETRIFICATION

Nobody knows exactly how wood petrifies. The old doctrine of replacement molecule by molecule of the substance of the wood, with mineral matter is quite at odds with the simple facts of elementary chemistry and the results obtained when a "peel" section of a coal ball is prepared.

EARLY PLANT LIFE

Certain Pre-Cambrian cherts have been found to contain, a variety of micro-organisms (unicellular and filamentous forms).

Chemical compounds (alkanes, pristane and phytane), believed, to be the decomposition products of chlorophyll (indicating some photosynthesis) have been identified in Early Pre-Cambrian rocks.

The oldest of the above remains are about three thousand, million, years old.

EARLY LAND PLANTS

"Land, plants" and. "vascular plants" are not necessarily the same; there are no vascular plants before the Late Silurian.

Psilophytales have lost much of their evolutionary significance. The group is artificial: also, plants believed to be primitive members of other groups existed contemporaneously with them.

Seeds, evolved from a mega sporangium, appear to have been recognised in the Upper Devonian.

THE GLOSSOPTERIS FLORA

Continental drift is an explanation of the present day positions of the fragments of Gondwanaland with its characteristic flora.

MESOZOIC FLORAS

Cycadeoidean inflorescences have been re-examined, and the classic textbook restorations shown to be misinterpretations; this group does not seem to be close to the Cycadales.

TERTIARY FLORAS

Dating may be complicated; floras of different altitudes may show differences that correspond in some respects to those from different latitudes or of different ages.

THE PROBLEM OF ORIGIN AND ANCESTRY OF ANGIOSPERMS

The problem has still to be answered. Angiospermous pollen has not been recognised below the uppermost Lower Cretaceous. A major problem is that angiosperms show so few characters that are constant throughout the class or are confined exclusively to them.

FOSSILIZED WOODS

Nomenclature and taxonomy of petrified (mineral infiltrated) woods may present difficult problems (especially with extinct pre-Cretaceous gymnosperms).

Extracts by R. M.

SWANSCOMBE

Notes taken from "Swanscombe , 1968" by J. d'A. Waechter & B. W. Conway, Proc. R. Anthrop. Inst., vol._ _pp.53-61, 1968.

GEOLOGICAL SEQUENCE

The following sequence, given bottom to top, was suggested, by previous authors, and verified by recent excavations.

Thanet Sands;- Eocene deposit of fine greenish sand, forming bench on which Pleistocene deposits rest.

Lower Gravel:- Partly a river gravel, although the lower part appears to be a solifluction deposit. This forms the lowest unit of the 100ft (= Boyn Hill) Terrace of the Thames Valley.

Lower Loam:- Fine buff loam lying conformably on the Lower Gravel, with a shelly sand at its base and a weathering horizon at the top. Pond, or marsh deposit.

Middle Gravel:- Divided into two units, both river gravels; the lower being deeply channelled by the upper. This channelling which extends down to the base of the Lower Gravel in places, represents a major change in base level within this phase of river aggradation.

Upper Loam:- Discontinuous deposit, similar to the Lower Loam.

Upper Gravel:- Distinctly solifluction material.

ARCHAEOLOGY

This is the richest site in Britain in terms of quantity of archaeological material found. Two phases are represented by the material.

i) From the Lower Gravel and Lower Loam – Clactonian

ii) From the Middle Gravel and Upper Loam - Acheulian.

MAMMALS

The most notable mammal remains to date are undoubtedly the three sections of human, skull, found at different times, in the Lower Gravel, all belonging to the same individual. They comprise two parietals and an occipital

Mammals are recorded from each layer, and the recent excavations have proved a certain concentration at the base of the Lower Loam, including elephant, rhino, and fallow deer.

PRESENT EXCAVATIONS

The present excavations extending over five seasons 1968-1972, are aimed mainly at studying the Clactonian of the Lower Loam and Lower Gravel, in situ.

Interesting features so far discovered, include implements extending down into the solifluction deposit at the base of the Lower Gravel, and implements throughout the thickness of the Lower Loam. The former suggests pre-interglacial industry (these terrace deposits "belong to the Hoxaian interglacial), and the latter a possible working floor or campsite on the margin of the marsh or pond represented by the loam.

- -

The Swanscombe site (Barnfield Pit) is owned by the Nature Conservancy and during this year, Conservation Year, will be ‘on show’ to interested parties.

P. Grainger.