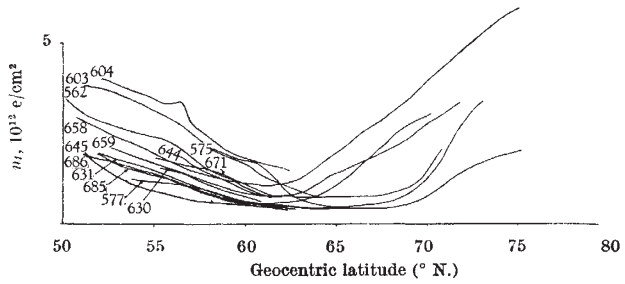

Fig. 2. Electron contents for a number of satellite transits shortly after local midnight during the second half of November 1964 plotted as a function of geocentric latitude

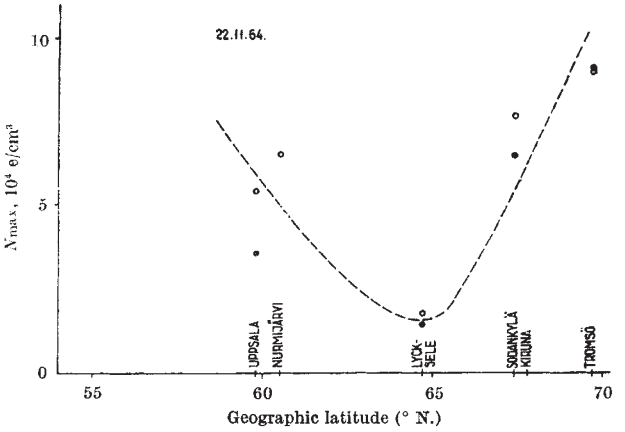

Fig. 3. Electron densities at the maximum of the F-layer, N_{max}, from 03 (○) to 04 (●) local time on November 22, 1964, plotted as a function of the geographic latitudes of the ionosonde stations

electron content up to the satellite altitude (1,000 km) can be due to this cause. It would mean that there are at least as many electrons above 1,000 km as below; electrons which can, moreover, in certain conditions move downwards. There is at present no evidence for the existence of such a reservoir of ionization in the upper F-region, though there are few relevant high-latitude observations. Thus it seems more reasonable to attribute the increase of n_t to low energy corpuscular radiation, possibly electrons, producing additional ionization in the ionosphere at auroral latitudes. Their energy must be less than 1 keV since electrons with higher energy reach altitudes below 180 km without ionizing the F-layer[4].

Further investigation of electron contents at auroral latitudes is needed before any definite conclusions can be drawn. It is already clear that the S-66 satellite is an excellent instrument in this type of investigation.

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GEOLOGY

Holothurian Sclerites from the Speeton Clay

DURING an examination of the Foraminifera from the Lower Cretaceous clays of Speeton, Yorkshire, a number of samples were found to contain holothurian sclerites. This was an unexpected occurrence, as Frizzell and Exline[1] have pointed out that virtually no work has been published on sclerites from strata of Cretaceous age. The only previous records of Cretaceous holothurian sclerites are *Calcligula* (?) *huckei* Frizzell from the Gault of Pomerania, *Theelia rotula* (Egger) from Germany and *Hemisphaeranthos frankei* (Müller) from the Turonian of Germany. '*Chirodota*' from the Hauterivian of France were noted by Deprat[2], and Wetzel[3] obtained sclerites from a Baltic flint which Deflandre-Rigaud[4] identified as *Myriotrochites elegans* (Schlumberger), *Chiridotites atavus* (Waagen) and *Chiridotites* cf. *ingens* (Joshua). More recently Kemper[5] recorded 'Holothurienreste' from the Hauterivian of Germany, though he did not describe them.

A systematic search for holothurian spicules in more than two hundred micropalaeontological residues of the Speeton clay, mainly from the type locality but also from borehole material, revealed several horizons which contained a large number of holothurian remains. All were obtained from strata of Hauterivian and Barremian age.

The sclerites from Speeton belong to four families, Achistridae, Theeliidae, Stichopitidae and Priscopedatidae; all are well preserved and free from matrix and secondary growth. Of particular interest in the Barremian clays is the occurrence of the Family Achistridae, which is represented by the species *Achistrum* (*Cancellrum*) *monochordata* Hodson, Harris and Lawson. This is a sclerite in the form of a hook, with a terminal loop which is crossed by a single cross-bar. Forty-one examples of this species have so far been found. With this record of *Achistrum* (*Cancellrum*) *monochordata* the range of the Family Achistridae, previously regarded as being from the Devonian (?) to the Jurassic, can now be extended to include the Lower Cretaceous.

It is interesting to note that *A. monochordata* is a common form species in the Oxfordian[6,7], though the specimens from the Barremian are generally smaller than those from the Jurassic. The widths of the terminal loop in the specimens from Speeton range from 0·090 mm to 0·144 mm, while those from the Oxfordian range from 0·162 mm to 0·324 mm.

So far as I am aware, holothurian sclerites have not previously been recorded from the Cretaceous of Britain.

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CHEMISTRY

Polyamide Layer Chromatography of DNP Amino-acids

METHODS for the identification of DNP amino-acids by paper or thin-layer chromatography were used to determine the N-terminal group in polypeptide structures. Recent developments in silica-gel thin-layer chromatography have made possible the rapid identification of amino-acids in biological mixtures[1].

The separation of various DNP amino-acids on a polyamide column was developed by Steuerle and Hille[2] and by Grassmann *et al.*[3], but no practical method for separating micro samples by polyamide thin-layer chromatography has been developed.

The polyamide layer (Chen-Hsin-Tang Chemicals Co., No. 75, Section I, HanKou St., Taipei, Taiwan), according to Wang[4], gave better results and durable polyamide layer. We have applied this polyamide layer to several