It appears that in this case orientation to gravity is due to a combination of bodily shape and posture. That it is not due to the activities of other appendages can be shown by removing the second antennæ, when they are unable to retain the normal orientation.

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¹ Lowndes, *Proc. Zool. Soc. Lond.*, 1093 (1933).

² McGinnis, *J. Exp. Zool.*, 10, 227 (1911).

³ Seifert, *Z. vergleich. Physiol.*, 11, 336 (1930).

⁴ Cannon, *Phil. Trans.*, 222, 267 (1933). *Proc. Roy. Soc.*, B, 117, 455 (1935).

⁵ Foxon, *J. Mar. Biol. Assoc.*, 19, 829 (1934).

Occurrence of Pollen of *Carpinus* (Hornbeam) in Irish Peat

ALTHOUGH peat samples from Continental bogs frequently yield hornbeam pollen, there appear to be so far only two records of it from British peat bogs; that from the Blanchland peat of Northumberland investigated by Raistrick and Blackburn¹, and that from the Orkneys².

There is no published record from Ireland. It might therefore be of interest to workers who are or have been engaged on pollen analysis in Ireland to know that pollen grains, probably of hornbeam, have been found in Irish peat. Two specimens were obtained at a depth of 1.5 m. from highly humified *Sphagnum* peat in the Burrough Bog, Timahoe, Co. Kildare, in the course of preliminary investigations. They were provided with four pores and measured 30–32 μ in diameter (Fig. 1).

FIG. 1. Photomicrograph of hornbeam pollen grain from Irish peat. Actual size, 31.2 μ . $\times$ about 850.

It is generally agreed that the hornbeam is not native in Ireland, and that in Britain it is native only in the south-east. So far as could be ascertained, the earliest record of the hornbeam in Ireland as an introduced tree is that found in Threlkeld's flora published in 1727, where he gives it the Irish name *Crann Sleauhain*.

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¹ *Proc. Univ. Durham Phil. Soc.*, 8, Pt. 4.

² Erdtman, *J. Linn. Soc. Bot.*, 46, 480 (1924).

Age of Ferro-Manganese Concretions

THE determinations of the radioactivity of a series of ferro-manganese concretions of the seas and lakes of the U.S.S.R.¹ (especially of the Kara Sea² and lakes of Karelia³) have brought out certain facts (the surface layer is more active than the central part, the want or insignificant contents of Th X–MsTh) which make possible the determination of the age of the concretions by the content of radium in its different layers.

The first specimen examined was one of the largest concretions from the Kara Sea (Station 74, expedition on the *Sedov* in 1934. Lat. 76° 2' N.; long. 86° 13' E., depth, 58 m.).

The concretion is of fairly regular, disk-like form with a pebble in the centre (size, 80–90 mm.; thickness, 11–12 mm.; weight, 117.74 gm.; size of pebble, 12–30 mm.; weight, 12.77 gm.). The concretion was divided into three shells, each of which consisted of a group of thin concentric layers.

The results of the chemical analysis (made by V. A. Yegorov) have shown the constancy of the chemical composition of the separate shells.

Determinations of radium gave the following results:

Shell	Average width	Weight	Ra content (per cent $\times 10^{-10}$)	Per cent
I	8 mm.	31.15 gm.	19.3	100.0
II	10 "	47.15 "	12.1	62.7
III	14 "	26.31 "	3.1	16.1

Such a decrease of radium content from the outer (I) to the inner (III) shell must be regarded as the results of its disintegration.

Taking the contents of radium in shell (I) as the earliest we obtain the following time-values:

From shell I to II . . . 1,100 years
" " I to III . . . 4,200 "

The age of the concretion examined would appear to be 5,300–5,500 years.

The results obtained show that in the development of the concretion there were periods (as for example between shells II and III) during which the growth of the concretion stopped or was greatly slowed down. Possibly, too, there are periods in which there was a partial destruction of surface layers.

The second specimen examined was a concretion from Lake Uksche, Karelia (size, 30–40 mm.; thickness, 18–20 mm.; weight, 10.10 gm.). The concretion was divided into two parts. Determinations of radium gave the following results:

	Average width	Weight	Ra content (per cent $\times 10^{-10}$)	Per cent
I (outer shell)	5 mm.	5.21 gm.	13.5	100.0
II (central part)	24 "	4.64 gm.	8.6	63.7

From the data obtained we obtain the following time-values from the outer shell to the central part, 1,030 years, and the age of the concretion about 2,000 years.

Investigations show that in several cases it is possible also to determine the rate of formation of