Table 1. Graft Transmission Experiments

Date of experiment	Scions from infected plants: No. of grafts	Scions from infected plants: No. of stocks showing symptoms	Control (healthy) scions: No. of grafts	Control (healthy) scions: No. of stocks showing symptoms
August 1957	2	2	2	0
July 1958	6	1	8	0
September 1958	10	5	10	0
January 1961	9	2	9	0
March 1961	19	5	20	0
May 1961	18	3	13	0
Totals	64	18	62	0

cucumber mosaic viruses. The evidence therefore indicates that the causal agent of the leaf symptoms of big vein could be transmitted directly from a diseased stem to a healthy one without entry through the roots. The identity of this causal agent, however, remains uncertain. A toxin or a virus may have been present in the scions from the infected plants or, alternatively, the scions may have been infected with *Olpidium* in such a fashion that the fungus was not removed by surface sterilization. These possibilities are being investigated.

Since this communication was submitted another account of graft transmission of the disease has been published by Campbell *et al.*[6].

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Early Tertiary Pollen Deposits in Ireland

Very little work has been published on pollen-analysis of Tertiary fresh-water deposits in the British Isles, although there is a considerable literature dealing with Continental work. Recently I attempted to date three Tertiary sites in Ireland by their fossil pollen content. They are: (1) a small deposit of lignitic clay at Ballymacadam, County Tipperary[1]; (2) the Lough Neagh Clays, an extensive deposit of clays, sands and lignites, about 400 metres thick in the borehole described by Wright[2]; (3) interbasaltic lignites of the Antrim basalt series[3]. The Lough Neagh Clays and underlying Antrim basalts occupy a very large area in north-east Ireland. None of the three deposits has been dated satisfactorily. Wright[2] tentatively suggested an early Tertiary date for the Lough Neagh Clays; Simpson[4] proposed a late Miocene or early Pliocene date for the interbasaltic lignites and an early Tertiary, perhaps late Eocene, age has been tentatively put forward for Ballymacadam[1]. I examined samples from Ballymacadam, from the interbasaltic beds at several sites, but especially from Craigahulliar quarry near Portrush, and from the Lough Neagh Clays from exposures at Thistleborough near Glenavy, County Antrim, and from boreholes at Washing Bay and Mire House, County Tyrone, which penetrated to the base of the clays. The Lough Neagh Clay samples, especially from Thistleborough, and the Ballymacadam samples contained abundant well-preserved pollen. The interbasaltic pollen was in poor condition.

The pollen floras from the Irish sites contain three elements: (1) species which range through most of the Tertiary, some disappearing at the beginning of the Pliocene, for example, *Engelhartia*, Sapotaceae, *Ilex*, *Symplocos*, Palmae, *Sciadopitys*, *Tricolporites megaexactus bruhlensis* (cf. *Clethra*), *Tricolpites liblarensis* and *T. microhenrici*; (2) species which do not seem to have been described before. These are rather numerous as the floras are very rich in species; (3) some species the presence of which points to an early Tertiary date. These include, *sensu* Krutzsch[5], 'plicatoid', 'rhizophoroid' and 'pseudocingulum' (Krutzsch's group 118) types, *Anacolosa* type, *Oligopollis* and spores of the 'cingulate', 'paradorogensis' and 'pseudodorogensis' groups. This assemblage suggests the end of the Eocene or earlier Oligocene. Ballymacadam has the richest representation of early Tertiary types and should be referred to the late Eocene. The Lough Neagh Clays resemble Ballymacadam in species composition, especially at their base, but the early Tertiary types are more feebly represented and pollen of Taxodiaceae and *Nyssa*, both very rare at Ballymacadam, appear in abundance. This gives the flora a younger appearance. However, many of the species present do not occur in deposits of Miocene and later Oligocene age from Germany, so that the Lough Neagh Clays are most probably of early or middle Oligocene age. A more precise statement is scarcely possible at present. The interbasaltic beds resemble the Lough Neagh Clays in containing much pollen of *Sequoia* type; but the remaining pollen is sparse and poorly preserved. One can only say that the interbasaltic flora appears to have more in common with the Lough Neagh Clays than with Ballymacadam and should be of intermediate age.

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VIROLOGY

Concentration and Partial Purification of Poliovirus by means of Zinc Hydroxide and Ion-exchanging Resin

Newton and Bevis[1] concentrated some animal viruses by adding zinc hydroxide to the virus suspension and afterwards dissolving the gel in saturated ethylenediamine tetraacetic acid solution in order to recover the virus. Attempts made in our laboratory to concentrate poliovirus by this method yielded unsatisfactory results.

Grossowicz *et al.*[2] concentrated the three types of poliovirus by directly preparing a cobalt, cæsium or manganese hydroxide gel *in statu nascendi* in the