APPENDIX I

Pollen Analysis of a Sediment Core from a Bog Adjacent to the Fisher Site

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The objective of the pollen study was to determine the age and vegetational history of the basin between the archaeological site and the former bar of glacial Lake Algonquin (see Figure 7.2, sedimentary unit 3B1, and Figure 7.15) and the chronological relationship of the two geological features with the archaeological site. The basin is presently a peat bog dominated by shrub willows (*Salix*), bullrush (*Scirpus*), sedge (*Carex*), cattail (*Typha*), and goldenrod (*Solidago*). The southernpart of the basin is vegetated with a white cedar (*Thuja*) forest.

Four cores were lifted from the bog with a 5.0 cm diameter piston sampler. The maximum penetration was 53 cm. The upper 29 to 37 cm was black amorphous peat. Below this was 4.0 to 8.0 cm of organic pond silt which overlies silty sand. The total stratigraphic sequence, although shallow and simple, records the development of a peat bog from a pond.

Pollen analysis was done on 13 levels from core 3 (Figure A1). Unfortunately, the pollen and spores were not well preserved. The pollen sum, excluding aquatic pollen and spores, was about 100. The microfossil concentration was estimated by spiking a measured sediment volume with a known number of *Lycopodium clavatum* spores. Pollen density was low, varying from 3,000 to 104,000 mL^{-1}.

Four pollen zones (McAndrews 1981) are present and correlate with the lithology. Zone 1, the spruce zone, is confined to the sandy silt horizon. This zone is dominated by pine (*Pinus;* 50%) and spruce (*Picea;* 30%) with small amounts of herbs such as Gramineae (grass) and Cyperaceae (sedge family). Of special interest is the presence of spores of *Selaginella selaginoides* (20%). This fern ally of subarctic calcareous fens is often associated with frost-heaved soils in the zone of continuous permafrost.

Zone 2, the pine zone, is contained in the organic silt horizon. This zone is dominated by pine (75%) with little else of significance except Cupressineae (cedar-juniper; 2.0–6.0%). Due to poor preservation, the pine pollen could not be distinguished as to species (white pine or jack pine), and thus subzonation is not possible.

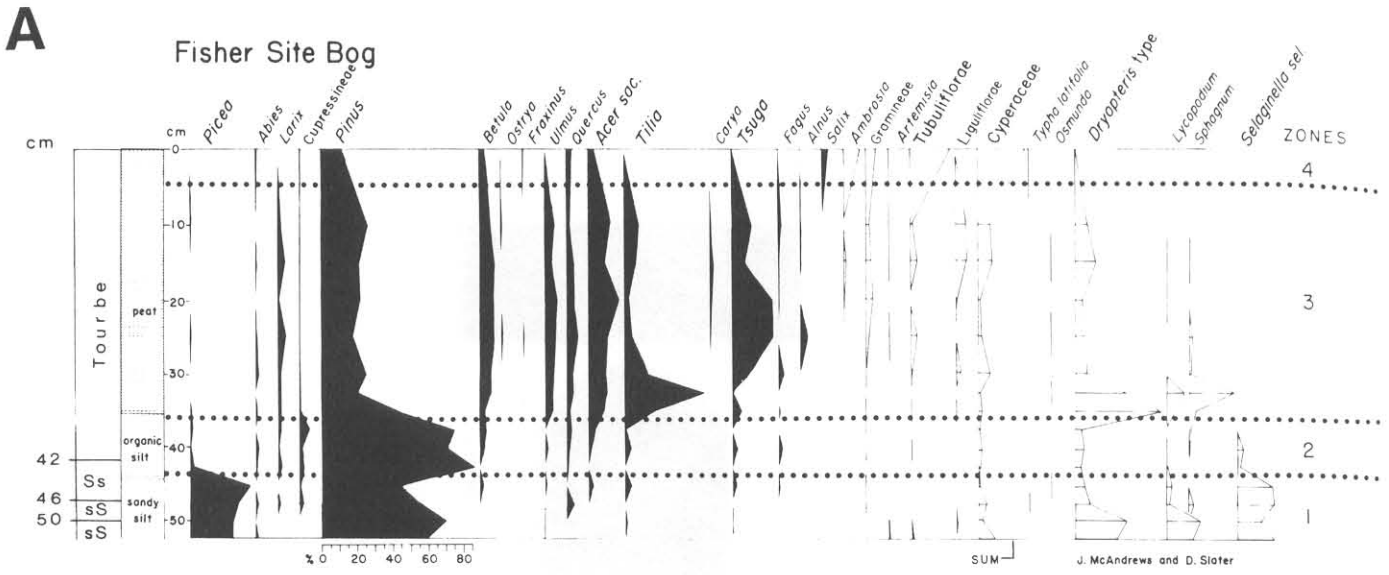
Zones 3 and 4 are confined to the peat. These zones are dominated by *Acer* (maple), *Tsuga* (hemlock), *Ulmus* (elm), *Betula* (birch), *Tilia* (basswood), and *Pinus.* Zone 4, represented only by a surface sample, is distinguished by *Ambrosia* (ragweed; 9.0%). Zone 3 has peaks of such spore-producing bog species as *Dryopteris* (shield fern), *Lycopodium* (club moss), *Sphagnum* (peat moss), and *Osmunda cinnamomea* (cinnamon fern). Pollen of the insect-pollinated compositae is abundant, as is that of Cyperaceae. Among the woody plants of wetlands only *Larix* (tamarack) is sufficiently represented by pollen to suggest that it grew on the site.

Pollen and spores from the surface sample reflect the modern local vegetation with high percentages of *Salix,* Tubuliflorae (goldenrod), and Cyperaceae.

Despite poor preservation, the pollen content of the core reflects both regional and local vegetation. Zone 1 probably represents a spruce dominated forest-tundra. The spruce was probably confined to warm, protected sites. The abundant pine pollen reflects the openness of this lakeside habitat rather than the presence of pine trees; at that time pine forests probably occurred south of Lake Ontario.

Pine trees replaced spruce at the boundary between pollen zones 1 and 2, an interval that dates 10,550 B.P. at nearby Edward Lake (Figure A1B; see also McAndrews 1981). The absence of macrobotanical material from the Fisher core precludes identification of the local vegetation but the organic silt indicates that during the spruce zone the present-day bog was a shallow pond and not part of a larger water body. The boundary between pollen zones 2 and 3 is dated at approximately 7,500 B.P. at Edward Lake and, by extrapolation, also at the Fisher bog.

Pollen zone 3 represents a modern mixed forest dominated by beech, maple, hemlock, elm, basswood, and white pine. The



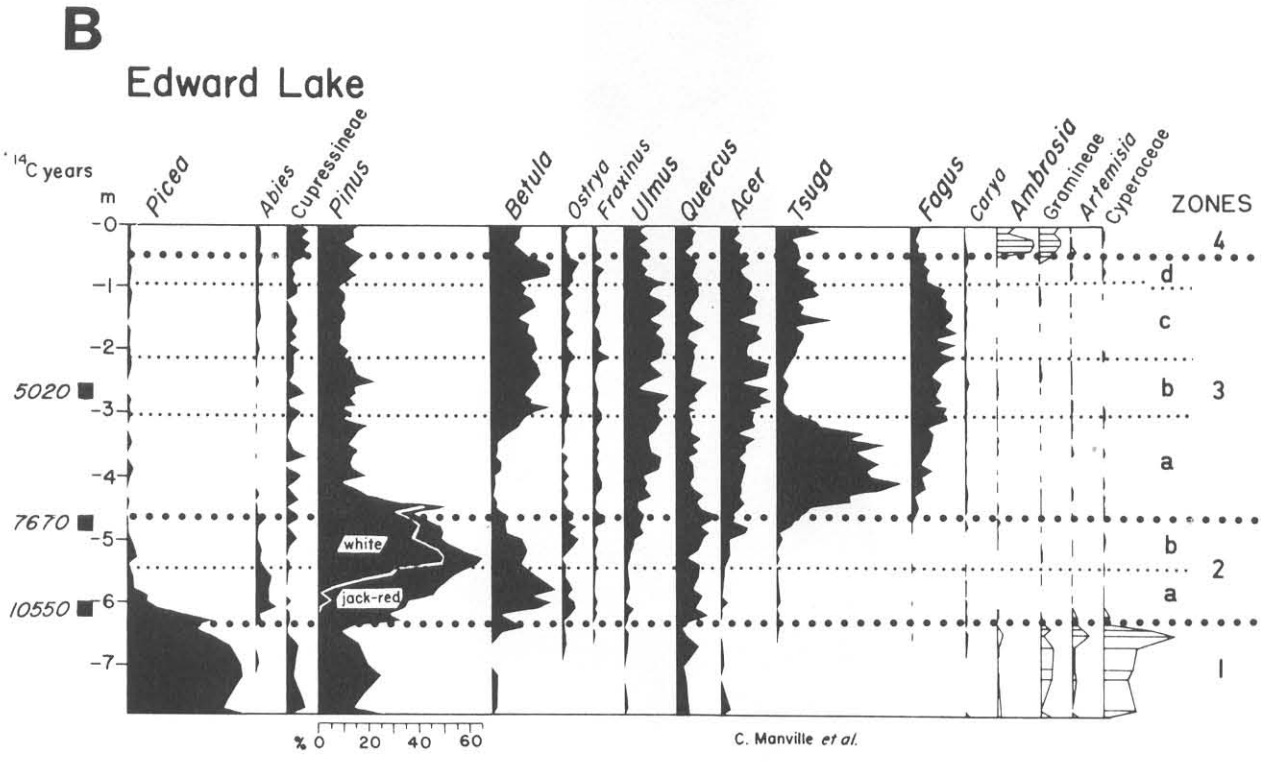


Figure A1. Pollen diagrams from the Fisher bog and Edward Lake, Ontario. "Tourbe," in the left column of diagram A, is a French term for peat, "Ss" is silty sand and "sS" is sandy silt.

abundance of basswood pollen and paucity of beech pollen may be an artifact of preservation rather than a reflection of the relative abundance of those trees. The peat in this zone represents a fen with abundant ferns. There is little or no evidence for local trees (except tamarack) or shrubs.

Pollen zone 4 represents the modern shrubby fen surrounded by cultivated fields supporting ragweed.

The basal sandy silt reflects a relatively high energy environment, perhaps with waves from Lake Algonquin occasionally breaking over the barrier bar into the lagoon. The lithology of the Fisher pollen core indicates that Lake Algonquin receded from the area during the interval between pollen zones 1 and 2, dated about 10,500 B.P. The subsequent pond persisted for 3,000 years but was replaced by a fen 7,500 B.P. due to a lowering of the water table probably caused by warming climate.

McAndrews and Jackson (1988) show that postglacial probocidian fossils in south-central Ontario all occur either above Lake Algonquin or in deposits attributed to that postglacial lake (the "Egypt" mammoth southeast of Lake Simcoe) and therefore date to pollen zone 1, the spruce zone. In south-central Ontario where the Fisher site occurs, mammoth fossils are more common than mastodont remains. Thus, if the Early Paleo-Indian occupants of the Fisher site were contemporaneous with Lake Algonquin, mammoth would probably have been a locally available prey animal.