Geese fouled Crawford Lake 700 years ago
Iroquoian cornfields led to guano-trophy

John H. McAndrews

Today Crawford Lake hosts only one breeding pair of Canada Geese, but in the 1300s the lake was alive with roosting geese. While roosting, the pellets they defecated fertilized the water with nitrates and phosphates and this stimulated algal blooms, most especially of diatoms. With the changing of the seasons, these masses of algae died and their decay produced stinky sulfur compounds; the people of the nearby Iroquoian village must have been annoyed. The evidence for this reconstruction comes from the lake mud.

The lake is in a Conservation Area (Halton Region Conservation) located along the Guelph Line 3 km south of Campbellville. Its small size (2.4 ha) and great depth (22.5 m) make it unusual. Firstly, it is meromictic (partly circulating) whereby only the water above 15 m circulates, producing a change in temperature and renewing dissolved oxygen; in contrast the water below 15 m does not circulate, remaining oxygen-free at a constant 6°C and accumulating toxic chemical compounds. In this biologically hostile bottom water, there are no sediment-disturbing detritivores such as insect larvae. Secondly, every year the lake deposits a millimetre of unusual sediment: a white layer of lime in June and a black organic layer in October. Unlike most lakes that circulate to the bottom and support detritivores, the two layers persist and in a sediment core can be counted and dated like tree rings.

In 1968, we began studying fossil pollen, and in sediment of the early 1400s found among abundant tree pollen grains a few pollen of corn and purslane. We assumed that the corn and purslane pollen blew into the lake from nearby cornfields. Following this lead, we commissioned an archaeological survey, which identified a dozen Iroquoian village sites within a few kilometres of the lake; the closest village was 150 m from the lake on deep soil where corn is grown today. Excavation showed the Crawford Village not only was the approximate age of the fossil corn pollen but the village soil also contained charred seeds of cultivated corn, beans, squash, sunflower and tobacco. The village was reconstructed, staffed by a half dozen interpreters and draws busloads of schoolchildren and German tourists.

In the 1990s, there was renewed interest in the fossil tree pollen, which showed rapid forest succession linked in time with Iroquoian farming. Computer modeling showed that the succession could have been caused by a cold period called the Little Ice Age. On the other hand, fossil charcoal peaks contemporaneous with Iroquoian farming suggested succession following forest fires pre-