

TABLE I.—Continued.

	L3319 L2387	L3322	L2388	L3320	L3321 L2389	L3318 L2390	L3323
Cyperaceae	x	x	x	x	x	x	x
Gramineae	x	x	x	x	x	x	x
<i>Leptocarpus simplex</i> A. Rich.	x	x	x	x	x	x	x

from the same horizon contained a grass-dominant pollen flora similar to those in the rest of the section. It is almost certain that *N. menziesii* and *L. ericoides* were dominant elements in the flora for very short periods only and the failure to find them again suggests that deposition of the peat has varied in rate laterally and perhaps even stopped in small patches for part of the time.

The occurrence of pollen of *Nothofagus fusca* group, *Dacrydium cupressinum*, and *Podocarpus* sp. in small amounts indicates that the trees were not entirely absent in the region but they were not important elements near the site of deposition. The dominance of grass with minor herb and shrub pollen in most of the profile and a general paucity of pollen of tree species suggests that the climate was unsuitable for the growth of forest in the area. The pollen evidence points to a considerably colder climate than the present climate and a depression of the upper altitudinal point of trees to at least present sea level and possibly lower. The present upper tree limit for the region is about 3,500ft, and the samples occur at about 50ft above present sea level. At the same time, c. 19,200 years ago, sea level was probably 350ft lower than present. The tree pollen probably came from trees growing some considerable distance from the deposit, perhaps up to 50 miles away on the floor of the present Cook Strait or Wanganui Bight.

The grassland probably grew in an environment equivalent to subalpine conditions above the tree line in the Tararua Range at the present day, and the change to *Nothofagus menziesii* dominance almost certainly represents only a very slight climatic amelioration. *N. menziesii* occurs in all samples and probably grew close enough to spread quickly as soon as conditions improved, even though the improvement was only a slight and very brief fluctuation. It is probable that *Leptospermum ericoides* dominance occurred at approximately the same time as the climate amelioration which permitted the spread of *N. menziesii* and it may represent a brief transitional phase. *L. ericoides* dominance was probably only local, judging by its abundance in L3320 and almost complete absence in the other samples. After the brief climatic amelioration in which conditions were probably similar to those near and just below the present tree line in the Tararua Range there was a reversion to conditions more suitable for cold-climate grassland-scrubland. Judged by the small change in the vegetation and its short duration, it is probable that the climatic fluctuation was extremely small and that conditions for most of the time represented by the deposits were not much colder than those necessary for the development of upper montane forest or scrub.