to Allan (1961); it therefore seems reasonable to class L3320 as part of the same warming as L2388.

After a seemingly brief period when silver beech, as scrub or forest, clothed the surrounding hills, this woody vegetation gave way to open grassland interspersed with scrub and herbs; the fact that the latter included *Urtica* (growing near the site of deposition) would seem to preclude a fully subalpine environment, since *Urtica* is not recorded in subalpine localities (Allan, 1961).

The seeds identified by Mr C. R. Lennie (Appendix II) doubtless came from plants growing close to the site of deposition. The species identified in most samples are plants of wet open areas and do not include any distinctively subalpine types (such as *Astelia linearis* Hook., which is known from other low-altitude cold floras in Wellington). One sample (B840, from Bed 4) lacks some of the species common in most of the series, and includes seeds of a "bush-lawyer" (*Rubus*), a genus more characteristic of lowland to montane forest than of subalpine scrubland.

DISCUSSION

Interpretation of past vegetation from pollen data in New Zealand is subject as yet to many uncertainties, which may be reduced by future studies of contemporary pollen rain in areas of known vegetation. Few cold-climate preparations are completely without rare pollen grains from anemophilous forest trees, but the significance of such tree pollen in relation to a flood of grass pollen is uncertain—they may have been transported hundreds of miles or only a few miles. The presence of lowland to montane plant fossils (*Rubus* seeds, *Urtica* and *Leptospermum ericoides* pollen) in preparations otherwise suggesting subalpine communities is also of uncertain significance. Finally, it is difficult to judge the significance for correlation of a fluctuation of the tree line so short in duration that its pollen record could not be found a second time despite two attempts to relocate it. These uncertainties of interpretation make it more important to record the data than to offer dogmatic interpretations.

RADIOCARBON DATE

A specimen of the 2in peaty silt at 97in to 99in in the section was submitted for ^{14}C dating (N.Z. 573). The date obtained, 19,200 years B.P. $\pm$ 560 years, is the mean date for a period of deposition that begins with an interval of relative mildness (*N. menziesii* horizon) and includes the subsequent cooling. It is assumed that the date applies to a period very shortly after the resumption of cold conditions, corresponding to the middle of the 2in bed dated.

PROVISIONAL CORRELATION

In Wellington Peninsula, 30 miles south of Paraparaumu, Brodie (1957) has presented evidence for a cold period, which he named the Takapu Stadial, from 20,000 to 23,000 years B.P. During the Takapu Stadial periglacial solifluxion filled pre-existing gullies with ill-sorted debris including remains of vegetation indicating climate considerably colder than the present. Judged by the presence of *Astelia* aff. *linearis* at low altitudes, the coldest Takapu Stadial climates were more extreme than those of the Lindale section. The main phase in fan building, when the greater part of the Matenga Fanglomerate was deposited, is correlated with the Takapu Stadial. The Lindale Section records the climate at the end of the stadial, a slight warming that allowed beech forest to return, followed by renewed cooling and periglacial fan-building. Whether the final stage of fan-building represents a later stadial (perhaps in the interval 18,000 to 15,000 B.P.) is uncertain on the evidence available locally; that such a later periglacial phase occurred is suggested by solifluxion deposits at Porirua (Brodie, 1957: 633).