

DISCUSSION

This work has shown that where a marine beach infauna is present it is distinctly divided into two faunas that have no inter-relationship and no overlap in range. These faunas are those of the supralittoral fringe and of the lower intertidal zone. Where there is fairly considerable exposure to wave action the lower limit of the former fauna is separated from the upper limit of the latter by a considerable vertical distance but this "vertical" gap between the faunas closes as conditions become sheltered. Whether or not the faunas meet, or overlap, under extremely sheltered conditions in this region merits investigation.

Mention must be made of a third fauna, that inhabiting the flotsam resting upon the beach. Casual observation suggests that the beach infauna is enriched by overlying flotsam: certainly, it is likely that the supralittoral fringe fauna is more or less inter-related with the flotsam fauna and it was hoped to throw more light on this relationship by dealing separately with the two faunas concerned. This work has specifically avoided the flotsam fauna (to be reported upon in another paper) which is regarded for the present as a separate fauna from the supralittoral fringe infauna. There is some reason to regard them separately for the supralittoral fringe fauna was well in evidence at Transect C, where flotsam was virtually absent (what fragments there were, were dry and shrivelled) while it was absent from Transect A, despite the presence of plentiful algal flotsam. Also, of course, flotsam may have a rich fauna where it lies on solid rock.

While the closeness of inter-relationship between the flotsam fauna and the supralittoral fringe infauna has yet to be determined here, there is nevertheless some relationship and both faunas have much wider lateral ranges in Ingles Bay than the infauna of the lower intertidal zone and are much less influenced by substratum texture than the last fauna. Most of the beach of Ingles Bay is free of flotsam and is entirely barren in contrast to Gooch's Beach which is particularly prone to accumulating flotsam.

The tables and figures of this paper indicate the composition of the supralittoral fringe fauna. By far the commonest species is the flotsam hopper *Talorchestia quoyana* but a variety of terrestrial arthropods (e.g., various diptera and beetles) and certain oligochaetes (K.002 A) are typically present. It should be noted that these include predators as well as detritus feeders and that larval insects are characteristic. The lower level reached by this fauna is apparently raised by increased wave action (lower limit at Transect C is 3ft higher than at Transect B).

Rocks and reef limit the beach area and complicate environmental conditions but it is obvious that the infauna of the beach is dependent on sheltered conditions. The important direct effects of wave action on the fauna are beach disturbance and scouring: apparently all the transects are subjected to this except, possibly, the lower part of Transect A. One might reasonably infer that there would be little time for a climax community of the lower intertidal fauna to become established except at Stations A8 and A9, and that younger communities exist higher up Transect A and at Transects B and C. The facts are not inconsistent with this interpretation but are inadequate to support a community-succession hypothesis.

We may now consider this low-level fauna in regard to the indirect effects of exposure to wave action, i.e., effects exerted upon it through the sediments of the beach. Apart from the changes in beach profile two trends in texture have been demonstrated, viz., from coarser to finer (i) moving southwards along Ingles Bay beach, and (ii) moving down the beach from H.W.S.T. to L.W.S.T. level. These trends match the situation as demonstrated by the hypothetical case presented in Figure 6.

If one regards the lower intertidal fauna here as more closely influenced by the beach texture (and concomitant conditions of water table, etc.), than by the duration of the existence of a certain beach texture (i.e., its stability) then its distribution at Gooch's Beach could be expected according to this hypothesis to