# *Comment on the Peripheral Antarctic-water Discharge*[1]

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No doubt the peripheral discharge around Antarctica tends to establish a westward coastal flow and may slow the Antarctic Circumpolar Current significantly, as suggested by Barcilon (1966, 1967). It should be noted that this effect would have strong seasonal variations. Virtually all of the discharge is accomplished from midsummer to late summer. Therefore, it is expected that the phenomena described by Barcilon would be effective only during the Antarctic summer months. In addition, another seasonal effect exists: the variation in the meridional density structure in the Antarctic surface water due to the alternate formation and melting of the pack-ice cover (melting from October to March, freezing during other months). The yearly fluctuation in the pack ice amounts to approximately $2.3 \times 10^{19}$ cm$^3$ (Munk 1966). The associated surface-layer density ($\sigma_t$) variations are from a low of 27.0 in summer to 27.4 in winter. In winter the density increases toward the continent, while in summer it decreases. Therefore, a seasonal coastal current should be established, with a westward flow occurring during the summer, that is, in concert with the peripheral discharge influence.

From the above considerations, one would expect that the Antarctic Circumpolar Current possesses a summer minimum in its volume transport. This is not the case. Recent estimates of the volume transport through the Drake Passage (Gordon 1967) indicate that the maximum transport is found during the summer. It is probable that other factors are more significant than either the phenomena discussed by Barcilon or the seasonal fluctuation in the ice cover discussed above.

*Acknowledgement:* The author's Antarctic research is supported by National Science Foundation grant GA-894.

1. Lamont Geological Observatory Contribution No. 1127.
Accepted for publication and submitted to press 23 August 1967.

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