In addition to the use of "terminal moraine" to describe these deposits, Kinahan referred to one particular feature as

> "a massive esker-like high accumulation of shingle".

While this terminology is perhaps unfortunate, the features he identified as resulting from this process are undoubtedly those we now call pro-talus ramparts.

Kinahan recognized these land forms in Counties Cork, Donegal, Galway, Mayo, Wexford, and Wicklow, and named specific locations where the process of debris accumulation could be observed during severe winters. He also brought to the attention of the scientific community the local term for such debris accumulations — *cloghsnatty* (correctly *clogha snachta*; Warren, 1979) or snow stones, which implies that their mode of formation was well understood long before the scientific study of glacial and periglacial phenomena had become established. Sadly, *clogha snachta* was not adopted by the scientific literature as were the Gaelic terms *eiscir* (esker) and *druim* (drumlin).

Finally, Kinahan's observations of *clogha snachta* were not confined to Ireland. He provided a brief description of a visit to the Canadian Rockies and, although

> "My visit ... was so short that my conclusions can scarcely be of much value ... it was long enough to explain points in the Irish drift phenomena previously inexplicable".

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SIR,

Terminus of Glaciar O'Higgins, southern Chile

Glaciologists have been delighted by the synoptic views of glacier regions that satellite-borne imaging systems have made possible during the past two decades. Landsats 1, 2, and 3, for example, provide systematic coverage of many major glacier areas, and the U.S.S.R. *Salyut* and U.S. *Space Shuttle* programs offer less systematic, but higher resolution, coverage of many of the same areas (Williams, 1987). There have been many experiments that have made use of satellite data and observations. Although some of the research has produced interesting results, as is commonly the case with new methods, some of the interpretations of satellite data may be erroneous. This brief note gives an alternative interpretation for an event in South America that was recorded during the *Salyut* program.

The southern Patagonian ice field has several dynamic outlet glaciers, but the region has been much less studied than comparable glacier regions in North America. The satellite-borne systems have acquired the only readily available data for some of the Patagonian glaciers. Glebova and others (1981) and later Denisov and others (1987) reported on *Salyut* observations on Glaciar O'Higgins and cited a recession of 12 km^2 between 22 and 30 December 1977, when a large tabular iceberg calved off. Because Glaciar O'Higgins is about 2 km wide, the linear recession would have been about 6 km.

Landsat images from 25 February 1976 (2399-13410) and 8 March 1979 (30368-13450-D) show that the glacier had a net recession of about 0.5 km during that 3 year interval. Denisov and others (1987) showed the glacier terminus, after the calving event, to be at about the 1976 and 1979 positions. The Denisov and others (1987) interpretation, that a calving event eliminated 12 km^2 of the glacier, would have required a 6 km advance over the scant 2 years from February 1976 to December 1977. Such an advance would have required an average speed of 9 m/d, assuming no calving. If there had been calving, which is very likely, the average speed required would have been even greater. I am not aware of any calving glacier that has made such a rapid advance.

I suggest that the event Denisov and others (1987) call a calving event of the glacier terminus was, in reality, the break-up of a mass of floating, freeze-welded lake ice, brash ice, and icebergs. A similar mass forms at the fjord head in front of calving glaciers in Alaska during winter and spring, and breaks up in late spring. A similar situation could likely occur in front of Glaciar O'Higgins in the southern winter and spring. The floating mass of lake ice, brash ice, and icebergs would be spectrally similar to the ice of the glacier, and could be easily confused with part of the glacier at spatial resolutions of 30–100 m. This heterogeneous mass of floating ice is dynamically different from either floating or grounded glacier ice, and it is important that a distinction be made when referring to the position of the glacier terminus.

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ERRATUM

Vol. 33, No. 115, p. 308, Fig. 12

Unfortunately, this illustration has been reproduced incorrectly. It should have appeared, reversed left to right, and inverted top to bottom.