

TABLE I.—Size analysis results of eight Glory Cove bottom samples.

	Innermost				Outermost			
Station Depth	Mu 67-36 22 feet	Mu 67-37 22 feet	Mu 67-19 42 feet	Mu 67-18 32-36 feet	Mu 67-38 36 feet	Mu 67-39 36 feet	Mu 67-17 30-55 feet	Mu 67-20 30-55 feet
Md*	4.80	4.65	6.95	5.80	4.30	6.26	4.50	4.90
M ϕ	5.45	4.78	7.40	6.15	5.08	6.66	5.18	5.82
s ϕ	2.33	2.48	2.55	3.12	3.03	2.34	3.23	3.32
α ϕ	0.28	0.05 ²	0.18	0.11	0.26	0.17	0.12 ⁴	0.28
Sand/	33	34.2	8.5	21.5	45	9.5	43.5	35
Silt/	34	36.8	27	31.5	24.5	36	21.5	26.5
Clay	33	19.0	64.5	47	30.5	54.5	35.0	38.5
Description	sandy mud	sandy mud	mud	sandy mud	sandy mud	mud	sandy mud	sandy mud

* The parameters in first column are defined as follows:

ϕ or phi: minus the log of the diameter in mm to the base 2; Md: median diameter in phi units; M ϕ : mean diameter in ϕ units, being effectively a measure of current strength; δ ϕ : Inman's approximation to standard deviation in phi units, giving measure of sorting (— the better the sorting, the lower being the value); α ϕ : measure of skewness (— a low value indicating a relatively symmetrical distribution); sand/silt/clay (or S/S/C) ratio, regarding 4 ϕ as boundary of sand and silt, 6 ϕ as boundary of silt and clay.

a reading of 34.46‰, as compared with a nearly open ocean surface reading of 34.81‰ off the SE of Stewart Island a few days earlier. In other words, Glory Cove is close to full offshore salinity; the limited run-off from the surrounding low country presumably not normally reducing its salinity significantly. Glory Cove surface sea temperatures at 9 a.m. were 14.2°C (air 12.7°C) on 15.2.67, and 13.8°C (air 12.7°C) on 16.2.67. These may be compared with 9 a.m. surface sea temperatures taken from the end of the Portobello Marine Station wharf, five miles from the opening to Otago Harbour, on the same dates. These latter were rather warmer, namely 16.0°C (air 15.0°C) on February 15, and 15.4°C (air 16.1°C) on February 16, 1967.

Glory Cove is surrounded by slightly hilly land, forest-clad to the water's edge around its western half, and by coastal scrub on a low neck of land along its south-east margin. Its shores have no habitations, but a small jetty attracts visitors by summer tourist launch. Thus, except immediately below the jetty, it is presumably practically unmodified. The shore consists of rocky outcrops, stones and small beaches.

The bottom of Glory Cove is mostly sandy mud, with an abundance of organic matter, chiefly in the form of faeces. Some samples had a considerable amount of shell gravel, predominantly of the shells of *Maoricolpus roseus*. Lamellibranch shells of several species were found in much smaller numbers, and a few shells of the brachiopod *Magasella sanguinea* were present.

Size analyses of bottom samples associated with the eight biological stations are summarised in Table I and some of them are shown graphically in Fig. 3. The sand/silt/clay ratios show most samples to consist of sandy mud, two of mud. Apart from station Mu 67-38, samples show a trend from coarsest in shallowest water to finest in deepest, which is reasonable for an enclosed bay. The high δ_s ϕ values