TABLE C.

Mean Values of the Harmonic Constants for Use in preparing the Tide-tables.

Tide Symbol.	Auckland. A_0 = 5·74 ft.		Bluff. A_0 = 5·38 ft.		Dunedin. A_0 = 3·23 ft.		Lyttelton. A_0 = 3·20 ft.		Wellington. A_0 = 2·93 ft.		Westport. A_0 = 5·00 ft.	
	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.	H.	K.
Short Period.	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°	Ft.	°
S1	0·010	17·35	0·009	94·60	0·015	14·41	0·035	31·91	0·003	331·06	0·011	69·61
S2	0·595	265·12	0·503	49·35	0·245	129·50	0·179	143·04	0·100	334·84	0·970	332·02
S4	0·020	334·01	0·010	225·12	0·007	318·52	0·009	202·78	0·004	207·87	0·008	49·18
S6	0·003	55·73	0·006	167·65	0·003	115·92	0·015	344·95	0·005	310·03	0·006	329·28
M1	0·011	144·69	0·013	119·06	0·010	108·52	0·010	99·40	0·007	0·39	0·016	86·66
M2	3·805	204·90	2·859	35·81	2·485	122·39	2·879	125·63	1·600	137·23	3·754	304·17
M3	0·038	199·10	0·010	272·60	0·016	262·98	0·016	112·80	0·024	175·36	0·021	210·07
M4	0·108	128·64	0·092	226·85	0·261	177·75	0·016	80·19	0·037	258·61	0·060	43·83
M6	0·024	309·52	0·087	79·41	0·072	357·87	0·022	68·96	0·014	90·98	0·026	36·73
O1	0·055	140·10	0·114	73·47	0·088	72·39	0·088	61·46	0·105	35·34	0·093	47·64
K1	0·235	168·27	0·059	116·06	0·074	90·24	0·148	82·58	0·084	81·79	0·074	184·13
K2	0·142	252·93	0·132	47·40	0·091	122·50	0·054	102·88	0·045	351·44	0·264	329·53
P1	0·075	165·26	0·023	105·71	0·023	94·68	0·051	112·04	0·032	74·67	0·024	130·32
J1	0·015	203·86	0·006	218·54	0·004	78·86	0·007	146·39	0·007	141·00	0·014	232·09
Q1	0·012	65·42	0·028	42·72	0·028	76·62	0·021	43·38	0·037	24·64	0·037	31·52
L2	0·171	202·92	0·106	32·24	0·155	102·59	0·088	148·45	0·048	124·43	0·089	280·34
N2	0·793	172·38	0·647	16·85	0·537	104·34	0·663	95·31	0·405	101·66	0·753	288·29
ν2	0·190	197·96	0·135	59·31	0·099	114·97	0·148	122·05	0·122	130·26	0·179	322·85
μ2	0·103	172·63	0·062	5·86	0·029	46·38	0·091	59·29	0·072	90·40	0·126	283·59
T2	0·067	293·47	0·021	94·47	0·017	231·08	0·030	219·85	0·036	283·24	0·048	11·68
(MS)4	0·180	195·00	0·080	1·53	0·108	140·91	0·102	123·98	0·035	134·53	0·103	297·37
(2SM)2	0·064	303·96	0·043	121·14	0·046	8·44	0·066	25·99	0·033	352·71	0·079	202·28
R2	0·023	214·72	0·014	121·64	0·014	198·62	0·013	150·12	0·015	132·60	0·041	236·31
Long Period.												
Mm	0·083	184·66	0·048	262·34	0·056	69·33	0·048	137·29	0·065	303·88	0·028	150·48
Mf	0·044	252·09	0·066	180·11	0·068	184·30	0·063	183·39	0·043	175·37	0·046	330·87
MSf	0·054	181·63	0·064	324·28	0·089	137·64	0·129	156·38	0·083	71·66	0·066	132·63
Sa	0·223	46·05	0·097	41·93	0·135	267·26	0·097	246·56	0·088	301·59	0·101	100·39
Ssa	0·065	113·05	0·110	90·56	0·073	104·27	0·085	139·91	0·086	153·27	0·124	109·27

An analysis of one year's observations of the observed times of the swinging of the light-ship at the Bluff to the flood and ebb tide was performed, with the results that the light-ship swings to the flood 27m. after low water, and to the ebb 21m. after high water, respectively, at Bluff Harbour Wharf. These values are in agreement with the hitherto published results in the "New Zealand Nautical Almanac."

A comparison of the predicted times of high water and low water as published in the tide-tables for the year 1921 with the actual values obtained from the automatic tide-gauge is given in Tables 1 to 3 in the report of Mr. E. J. Williams, Tide-computer (appended) for the ports of Auckland, Wellington, Bluff, and Westport.

The error in the times and heights of high and low water are of the same order as those shown in all tide-tables computed by the method of harmonic analysis, and the tide-tables are considered satisfactory for the purposes of navigation.

Two new tide-gauges, on the same pattern as that operating at Wellington, were manufactured locally by Messrs. Littlejohn and Son. One is installed at Lyttelton and the other at Dunedin, replacing the very old and unreliable gauges hitherto in use at these ports. The new gauges are performing satisfactorily.

The mean high-water mark has been determined from the record of the year 1921 for the following places. The readings on the tide-gauges of the mean high-water marks are: Auckland, 9·73 ft.; Wellington, 4·64 ft.; Bluff, 8·27 ft.; Westport, 8·60 ft. These readings are for practical use in defining high-water marks along the foreshore.

The tide-tables for the year 1924 were received in Wellington from the Director, National Physical Laboratory, Teddington, on the 20th September, 1922.

Advice was received from the Hydrographer to the Admiralty at the end of May, 1922, that the Tidal Department at the Laboratory was closed and the tide-predicting machine transferred to India. The Director of the Laboratory had, however, run off the curves to enable him to supply predictions for 1924 and 1925. The Government then authorized the Hydrographer to make arrangements for the prediction of the tide-tables for six New Zealand ports for 1926 and onward. The exchange of the New Zealand tide-tables with other responsible national authority requiring them for inclusion in published tide-tables, in accordance with the recommendations of the International Hydrographic Conference, 1919, is contemplated by the Hydrographer. The New Zealand predictions have therefore been placed at his disposal for exchange purposes, which will be of great advantage to the Dominion in having the New Zealand tide-tables published abroad, and will lead to the inclusion of predictions from more foreign parts in the Admiralty Tide-tables.