Additional Radiocarbon Dates, Tyrrell Sea Area*

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Tyrrell Sea is the name given by Lee (1960) to the postglacial marine waters that extended beyond the borders of the present Hudson Bay and James Bay basins. Lee (1960) and Matthews (1966) are among those who have published radiocarbon dates for various materials (shells, peat, wood) collected from raised deposits of this area, but they go farther than other authors by their deductions on the rate of postglacial emergence of the land based on the age/elevation relationships of the samples. Both reached comparable conclusions on the basis of different sets of dates, i. e. that prior to about 6, 500 years B. P. the rate of uplift was of the order of 20 feet per century, and subsequently decreased to about 1 foot to 3 feet per century.

Such rates of emergence can be determined only relatively because of various uncertainties, the chief of which is the difficulty of correlating each sample with the actual corresponding stand of the sea. Molluscan samples with the shells still in living position are rare, and it is only with such samples that any reasonably reliable estimate of corresponding sea-level can be made. Most shells found are of a fragmentary nature suggesting considerable transport and/or reworking after death. Wood samples were certainly washed into the retreating sea from higher elevations than those at which they have been found, and peat deposits would not have formed until after the site on which they developed had emerged from the sea. Another possible source of unreliability is the variety of materials dated.

The writer has made use of dates presented in Lee's papers, and those from Matthews' paper for the part of his area lying closest to Hudson Bay. Dates from other sources have also been used (Craig & Fyles, 1960; Dyck & Fyles, 1963, 1964; Dyck, Fyles & Blake, 1965; Dyck, Lowdon, Fyles & Blake, 1966; Olson & Broecker, 1959; Walton, Trautmann & Friend, 1961), in addition to those determined for samples collected by the writer. Collecting sites for all of these samples are shown in Figure 1. Table 1 presents detailed information about each locality.

TABLE 1

Locality	Age (years B. P.)	Elev. (ft.)	Material	Reference
1. S. end of Kaminak Lake, N. W. T.	6975 ± 250	210	Marine shells	Lee, 1959
2. 20 mi upstream from mouth of Kazan River, N. W. T.	5900 ± 130	250	Marine shells	Dyck, Lowdon, Fyles & Blake, 1966
3. 2 mi N. of Baker Lake settlement, N. W. T.	5480 ± 150	295	Marine shells	Dyck, Lowdon, Fyles & Blake, 1966
4. Baker Lake, N. W. T., at mouth of Prince River	1800 ± 60	30	Tundra plant debris	Dyck & Fyles, 1963
5. 15 mi N. W. of mouth of Mistake Creek, N. W. T.	6830 ± 170	415	Marine shells	Dyck, Lowdon, Fyles & Blake, 1966
6. Near head of Wager Bay, N. W. T.	5470 ± 140	184	Marine shells	Dyck & Fyles, 1963
7. 20 mi N. W. of Repulse Bay settlement, N. W. T.	6850 ± 140	397	Marine shells	Dyck, Lowdon, Fyles & Blake, 1966
8. N. W. Southampton Island, N. W. T.	5600 ± 300	170	Marine shells	Craig & Fyles, 1960; Lee, 1960

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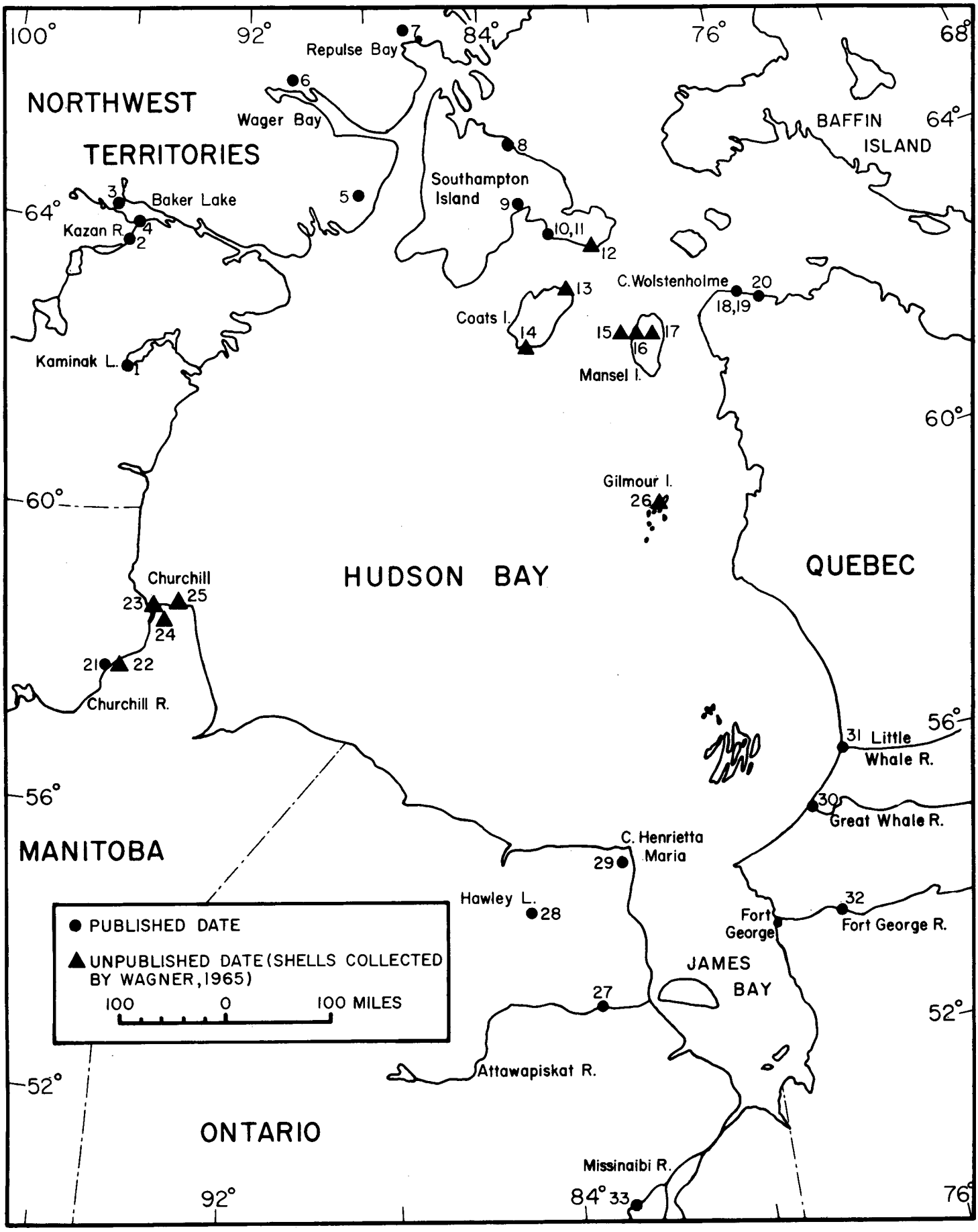

Figure 1 - Radiocarbon-date localities of samples from raised beaches and islands on the periphery of Hudson Bay.

9. Southampton Island, N. W. T.	3670 ± 270	105	Marine shells	Craig & Fyles, 1960
10. Southampton Island, N. W. T.	< 2600	70	Burned bone	Craig & Fyles, 1960; Lee, 1960
11. Southampton Island, N. W. T.	2191 ± 120	40	Burned bone	Craig & Fyles, 1960; Lee, 1960
12. Bell Peninsula, Southampton Island, N. W. T.	7170 ± 90	190	Marine shells	*Unpublished. GX1068
13. Cape Pembroke, Coats Island, N. W. T.	5440 ± 360	250	Marine shells	*Unpublished. GX1067
14. S. W. Coats Island, N. W. T.	5815 ± 90	50	Marine shells	*Unpublished. GX1066
15. Mansel Island, N. W. T.	6335 ± 85	215	Marine shells	*Unpublished. GX1071
16. Mansel Island, N. W. T.	6395 ± 90	265	Marine shells	*Unpublished. GX1069
17. Mansel Island, N. W. T.	7115 ± 100	300	Marine shells	*Unpublished. GX1070
18. Erik Cove, near Cape Wolstenholme, Quebec	7350 ± 180	360	Marine shells	Matthews, 1966
19. Erik Cove, near Cape Wolstenholme, Quebec	6900 ± 130	271	Marine shells	Matthews, 1966
20. "Baie Oblongue", E. of Cape Wolstenholme, Quebec	7160 ± 195	365	Marine shells in situ	Matthews, 1966
21. 55 mi S. W. of Churchill, Manitoba	7270 ± 120	465	Marine shells	Dyck & Fyles, 1964
22. Churchill River, 50 mi S. W. of Churchill, Manitoba	8010 ± 95	220	Marine shells	*Unpublished GX1063
23. Left bank of Churchill River, Manitoba at mouth	2800 ± 110	125	Marine shells	*Unpublished. GX1065
24. 17 mi S. E. of Churchill, Manitoba	3190 ± 80	100	Marine shells	* Unpublished. GX1072
25. 20 mi E. of Churchill, Manitoba	385 ± 80	12	Marine shells	*Unpublished. GX1073
26. S end of Gilmour Island, N. W. T.	5925 ± 95	250	Marine shells	*Unpublished. GX1061
27. Attawapiskat River, 4 mi above Muketei River, Ontario	5670 ± 110	460	Peat	Dyck & Fyles, 1963
28. 2.2 mi W. of N. end of Hawley Lake, Ontario	5580 ± 150	425	Peat	Dyck, Fyles & Blake, 1965

29. 20 mi S. of Cape Henrietta Maria, Ontario	1210 ± 130	46	Peat	Dyck, Fyles & Blake, 1965
30. Great Whale River settlement, Quebec	3020 ± 120	90	Wood	Olson & Broecker, 1959; Lee, 1960
31. Little Whale River, Quebec, 4 mi E. of Hudson Bay	4740 ± 110	155	Wood	Dyck & Fyles, 1963
32. Fort George River, Quebec, 36 mi E. of Fort George River settlement	3700 ± 130	175	Wood	Olson & Broecker, 1959; Lee, 1960
33. Missinaibi River, Ontario, 13.5 mi downstream from Bull' Bay	7875 ± 200	400	Marine shells	Walton, Trautmann & Friend, 1961

* F. J. E. Wagner collections, 1965. Numbers are Geochron Laboratories sample numbers.

The above-mentioned radiocarbon dates are plotted relative to position above present sea-level in Figure 2A. The newly presented dates fit well into the pattern of age/elevation relationship of the previously published dates. Three curves (Figure 2B) may be drawn from the points shown in Figure 2A. Curve I represents the northern Tyrrell Sea area and is based on dates 1-20 inclusive, Curve II (dates 21-26) covers the central area, and Curve III (dates 27-33) the southern Tyrrell Sea area. The distribution of points for the northern and central regions is such that satisfactory curves may be drawn. Points for the southern area show considerable scatter, so that it is not possible to draw a curve with any degree of certainty. However, a curve parallel to Curves I and II is not impossible. In each case, a curve representing the true rate of uplift would lie above the curve shown on the graph.

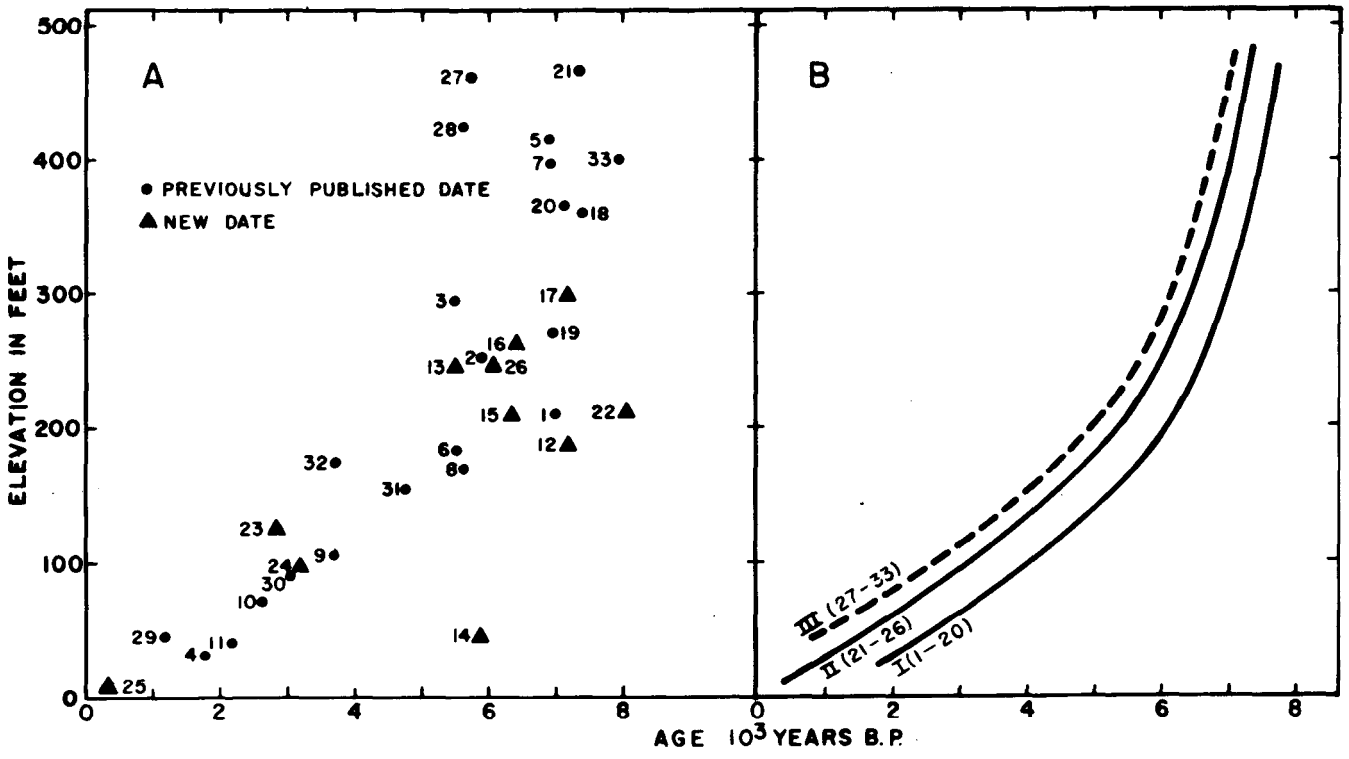

Figure 2A - Radiocarbon ages relative to elevations above present sea-level.

Figure 2B - Uplift curves. 1, northern Tyrrell Sea; 11, central Tyrrell Sea; 111, southern Tyrrell Sea.

The three curves follow the pattern of ice retreat and subsequent uplift of the land. The southern area was freed from ice at an earlier date and has been rising for a longer period of time than the northern area. Thus, samples of corresponding ages are found at higher elevations in the southern part of the area than in the northern part.

Collections by the writer were made during participation in the 1965 Hudson Bay Oceanographic Project of the Bedford Institute of Oceanography. Dating of the samples was by Geochron Laboratories, Inc.

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