

MIAMI NATURAL RADIOCARBON CORRECTIONS I-III*

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A systematic error of calculation has been included in all radiocarbon age figures released from this laboratory (Miami I, II, and III). The error affects dates of all materials, organic and inorganic, terrestrial and marine, in the same way, namely making them about 410 yr too young. Instead of adding to the confusion by correcting the old age figures we preferred to recalculate the dates starting from the measured isotope ratios. Table 1 below reports the correct age figures as calculated in the following way:

The present-day value of Δ for each sample was calculated from the measured isotopic ratios using Broecker's formula (Lamont VIII).

$$\Delta = \delta C^{14} - (2 \delta C^{13} + 50) (1 + 0.001 \delta C^{14}) \quad (1)$$

When at zero age, the sample was formed, its C^{14} assay was Δ_0 . The age is then calculated from:

$$\text{Age} = -\frac{t_{1/2}}{\ln 2} \ln \frac{1000 + \Delta}{1000 + \Delta_0} \quad (2)$$

For samples deriving their carbon from the air we consider $\Delta_0 = 0$. For samples deriving their carbon from sea-water we take $\Delta_0 = -50$. The latter figure is considered a good sea surface water average yefore A.D. 1960, as calculated from values by Broecker and Olson (Lamont VIII) and Fonselius and Östlund (1959). Calculated in this way, the "age" for marine samples is expressed as the *elapsed C^{14} time* since the organism was living in the sea. This time span is 410 yr less than the *apparent C^{14} age*.

Some samples, diluted before counting, were previously assigned too low sigma figures. These errors are also corrected in this list.

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TABLE 1

Correct C^{14} dates from Miami I, II, and III

C^{13} values in parenthesis are measurements on similar material. M or T in the fourth column denotes marine or terrestrial material respectively.

Lab. No. ML-	Date List	Previous Date	M T	δC^{13} ‰	δC^{14} ‰	Correct C^{14} age	C^{14} Date
12	I, II	3700	M	(0.0)	-400	4105 ± 90	2155 B.C.
13	I, II	4005	M	(0.0)	-423	4420 ± 100	2470 B.C.
14	I, II	6615	M	(0.0)	-583	7030 ± 130	5080 B.C.
15	I	2630	M	(0.0)	-315	3040 ± 105	1090 B.C.
17	I	8275	M	(0.0)	-658	8620 ± 120	6670 B.C.
19	I	12,810	M	(0.0)	-807	13,220 ± 185	11,270 B.C.
20	I	21,040	M	(0.0)	-931	21,480 ± 335	19,530 B.C.
21	I	1515	M	(0.0)	-213	1925 ± 90	A.D. 25
22	I	8750	M	+2.6	-679	9180 ± 115	7230 B.C.
23	I	16,125	M	(0.0)	-872	16,520 ± 215	14,570 B.C.
24	I	26,275	M	(0.0)	-964	26,710 ± 570	24,760 B.C.

TABLE 1 (Continued)

Lab. No. ML-	Date List	Previous Date	M T	δC^{13}	δC^{14}	Correct C ¹⁴ age	C ¹⁴ Date
28	I	2425	M	+2.9	-293	2835 ± 70	885 B.C.
29	I	4785	M	+2.9	-473	5195 ± 75	3245 B.C.
30	I	18,190	M	+1.1	-901	18,590 ± 265	16,640 B.C.
32	I	910	M	+4.0	-144	1320 ± 65	A.D. 630
33	I	1145	M	+4.9	-167	1550 ± 70	A.D. 400
34	I	3350	M	+2.5	-370	3755 ± 75	1805 B.C.
35	I	5200	M	+3.2	-499	5640 ± 85	3690 B.C.
36	I	3685	M	+3.8	-394	4090 ± 80	2140 B.C.
37	I	790	M	+4.9	-130	1205 ± 65	A.D. 745
38	I	1770	M	+4.0	-231	2180 ± 65	230 B.C.
39	I	6770	M	(0.0)	-591	7185 ± 250	5235 B.C.
40	I	5965	M	+2.5	-545	6370 ± 90	4420 B.C.
41	I	29,120	M	+2.3	-975	29,640 ± 850	27,690 B.C.
48	I	1520	M	+2.6	-209	1930 ± 65	A.D. 20
49	I	2285	M	+3.3	-280	2700 ± 65	750 B.C.
50	I	7280	M	+5.1	-612	7695 ± 95	5745 B.C.
51	I	4715	M	+3.8	-467	5120 ± 80	3170 B.C.
52	II	<300	M	(+3.3)	-79	720 ± 100	A.D. 1230
53	II	2105	M	+3.6	-263	2515 ± 65	565 B.C.
54	II	2515	M	+3.3	-300	2920 ± 60	970 B.C.
55	II	845	M	+2.8	-139	1250 ± 60	A.D. 700
56	II	2370	M	+2.9	-288	2780 ± 65	830 B.C.
57	II	2315	M	+4.5	-284	2760 ± 65	810 B.C.
58	II	2500	M	+2.7	-300	2910 ± 65	960 B.C.
60	II	1515	M	+2.6	-208	1915 ± 60	A.D. 35
61	II	1810	M	+2.6	-237	2220 ± 65	270 B.C.
62	II	3650	M	+3.1	-393	4065 ± 70	2115 B.C.
63	II	4335	M	+2.7	-442	4735 ± 75	2785 B.C.
66	II	1210	M	(+3.3)	-177	1620 ± 250	A.D. 330
67	II	1180	M	(+3.3)	-174	1595 ± 160	A.D. 355
68	II	7700	M	(+3.3)	-633	8110 ± 115	6160 B.C.
69	II	6950	M	(+3.3)	-597	7360 ± 105	5410 B.C.
70	II	8570	M	(+1.5)	-672	8980 ± 210	7030 B.C.
71	II	8350	M	(+1.5)	-662	8740 ± 175	6790 B.C.
72	II, III	12,480	M	(+1.5)	-798	12,880 ± 200	10,930 B.C.
73	II, III	12,770	M	+0.3	-806	13,180 ± 150	11,230 B.C.
75	II	7890	M	(+3.3)	-642	8312 ± 100	6362 B.C.
77	II	>45,000	M	(0)	000	>45,000	
78	II	22,570	M	+0.7	-843	23,020 ± 340	21,070 B.C.
79	II	34,970	M	+0.3	-888	35,300 ± 1700 -1300	33,350 B.C.
80	II	4425	M	+2.7	-449	4835 ± 70	2885 B.C.
81	II	6160	M	+3.8	-555	6570 ± 80	4620 B.C.
83	II	1480	M	+6.3	-199	1890 ± 60	A.D. 60
84	II	955	M	+4.2	-149	1370 ± 50	A.D. 580
85	II	645	M	+4.4	-114	1040 ± 50	A.D. 910
86	II	2025	M	+4.8	-254	2440 ± 55	490 B.C.
87	II	3075	T	-18.4	-376	3900 ± 65	1950 B.C.
89	II	11,180	T	-23.8	-763	11,590 ± 140	9640 B.C.
90	II	9930	T	-22.8	-723	10,350 ± 130	8400 B.C.
91	II	14,870	T	-24.3	-851	15,340 ± 200	13,390 B.C.
92	II	<200	T	-23.5	-18	<200	
94	II, III	8860	M	(-0.9)	-685	9270 ± 200	7320 B.C.
95	II, III	15,220	M	-1.6	-857	15,600 ± 220	13,650 B.C.
96	II, III	21,910	M	-1.9	-938	22,300 ± 430	20,350 B.C.
97	II, III	27,440	M	-3.0	-969	27,900 ± 950	25,950 B.C.
100	II, III	18,785	M	(+1.5)	-908	19,210 ± 510	17,260 B.C.
101	II, III	19,100	M	(+1.5)	-911	19,500 ± 300	17,550 B.C.
102	II, III	24,350	M	(+1.5)	-954	24,740 ± 510	22,790 B.C.
103	II, III	22,870	M	(+1.5)	-945	23,300 ± 350	21,350 B.C.
106	II	15,910	M	(+1.7)	-868	16,300 ± 215	14,350 B.C.
107	II	14,310	M	+1.1	-840	14,750 ± 150	12,800 B.C.
108	II	17,600	M	(+1.5)	-893	18,000 ± 280	16,050 B.C.

TABLE 1 (Continued)

Lab. No. ML-	Date List	Previous Date	M T	$\delta^{13}\text{C}$ $\delta^{13}\text{C}$	$\delta^{14}\text{C}$ $\delta^{14}\text{C}$	Correct C ¹⁴ age	C ¹⁴ Date
109	II	15,880	M	+1.8	-868	16,305 ± 190	14,355 B.C.
110	II	22,260	M	+1.5	-940	22,600 ± 450	20,650 B.C.
111	II	19,340	M	(+1.5)	-914	19,725 ± 275	17,775 B.C.
112	II	4140	M	+1.5	-430	4545 ± 80	2595 B.C.
113	II	3555	M	(+1.5)	-387	3960 ± 100	2010 B.C.
114	II	480	M	(-1.5)	-108	900 ± 60	A.D. 1050
115	II	1065	M	-1.5	-170	1475 ± 65	A.D. 475
116	II	8195	M	-1.5	-658	8600 ± 110	6650 B.C.
117	II	1495	M	+2.3	-207	1905 ± 75	A.D. 45
118	II	<200	T	-22.5	-16	170 ± 60	A.D. 1780
119	II	<200	T	-23.5	-20	185 ± 60	A.D. 1765
120 A	II	<200	T	-17.6	-22	300 ± 60	A.D. 1650
120 B	II	<200	T	-16.0	-34	425 ± 60	A.D. 1525
121 A	II	760	T	-16.5	-122	1185 ± 125	A.D. 765
121 B	II	590	T	(-16.0)	-67	580 ± 130	A.D. 1370
123	III	<200	M	+0.7	-29	250 ± 60	A.D. 1700
124	III	465	M	+2.2	-98	865 ± 80	A.D. 1085
125	III	540	M	+1.6	-108	945 ± 80	A.D. 1005
132	III	<200	M	+6.9	-71	710 ± 60	A.D. 1240
135	III	210	M	+0.1	-74	620 ± 600	A.D. 1330
136	III	2760	M	-0.4	-326	3165 ± 600	1215 B.C.
137	III	7720	M	-1.1	-637	8125 ± 150	6175 B.C.
138	III	30,200	M	-0.2	-978	30,665 + 1300 - 1100	28,715 B.C.
139	III	31,650	M	-0.8	-992	>31,700	
140	III	30,720	M	-0.2	-980	31,140 + 900 - 700	29,190 B.C.
141	III	45,000	M	(+1.5)	-974	>30,000	
153 A	III	9700	T	-24.7	-716	10,120 ± 105	8170 B.C.
153 B	III	9900	T	-24.5	-723	10,320 ± 105	8370 B.C.
157	III	42,200	M	+4.5	-995	42,600 + 4400 - 2800	40,650 B.C.
158	III	42,700	M	+0.4	-995	42,600 + 5100 - 3100	40,650 B.C.
159	III	13,700	M	-24.2	-776	14,050 ± 210	12,100 B.C.
160	III	3960	M	-21.0	-414	4390 ± 210	2440 B.C.
161	III	4760	M	+0.4	-474	5170 ± 80	3220 B.C.
162	III	4965	M	+0.4	-487	5370 ± 400	3420 B.C.
163	III	13,780	M	+0.4	-829	14,190 ± 600	12,240 B.C.
164	III	14,680	M	+0.1	-847	15,090 ± 270	13,140 B.C.
165	III	21,850	M	-0.6	-938	22,280 ± 370	20,330 B.C.
166	III	21,220	M	+1.8	-932	21,650 ± 350	19,700 B.C.
167	III	<200	M	+6.4	—	<300	
168	III	915	M	+7.8	-138	1330 ± 60	A.D. 620
185	III	10,580	M	+0.8	-745	11,000 ± 125	9050 B.C.

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