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PREHISTORIC COLONIZATION OF NORTHEASTERN SIBERIA AND MIGRATION TO AMERICA: RADIOCARBON EVIDENCE[1]

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ABSTRACT. This review of radiocarbon dates from northeastern Siberian Paleolithic sites provides data that can be applied to establishing a chronology of human settlement, and that can provide a rough estimate of the timing of the initial peopling of the New World.

INTRODUCTION

Radiocarbon dating of ancient sites is one of the most useful and important aspects of chronometric age determination (Aitken 1990). This method is used extensively to establish the chronologies of both northeast Siberian and northwest North American Paleolithic cultures and migrations to the New World (see, *e.g.*, Morlan 1987; Hoffecker, Powers and Goebel 1993; Whitley and Dorn 1993). Waters (1985) made one of the most appropriate critical overviews of ^{14}C dating for the earliest (pre-Clovis) sites in the Americas. The aim of this review is to present the ^{14}C dates of northeast Siberia, together with a brief discussion of their relevance to an important scientific problem—the peopling of the New World. Because the majority of sources of Siberian ^{14}C dates are in Russian, it is useful to compile an English-language review for the international scientific community.

METHODS

Table 1 lists the ^{14}C dates from Paleolithic sites of northeast Siberia, from Lake Baikal to Chukotka (Figs. 1–3). The list includes dates from published sources through Autumn 1993, but includes no references. Besides the dates, Table 1 includes such information as sample material, context and depth below surface. Dates are grouped into geographical regions of northeastern Siberia.

DISCUSSION

Early Upper Paleolithic (39,000–24,000 BP)

Ancient sites that are associated with the Early Upper Paleolithic have not been ^{14}C dated, except for the Filimoshki site (Table 1). Up to the present, Early Paleolithic and Mousterian sites of northeastern Siberia are unknown in well-defined geological contexts (Yi and Clark 1983; Kuzmin 1992a; Kuzmin and Krivonogov 1994). The earliest Upper Paleolithic sites of the area are Makarovo 4, Arta 2 (Layer 4), Tolbaga (Layer 4), Varvarina Gora (Layer 2), Ust-Kova (Layer 7) and Geographical Society Cave (Fig. 1). Dates of these sites range from 39,000 to 27,200 BP.

Kirillov and Kasparov (1990) assumed that Layer 4 of the Arta 2 site is associated with the cultural stage preceding the Upper Paleolithic. Mochanov (1977) used ^{14}C dates from the Ust-Mil 2 (Layers B, C) and Ikhine 2 (Layers 2 b, c, d) sites to suggest that the beginning of the Dyutkai complex lies between 30,000 and 35,000 BP. Some archaeologists, for example, Abramova (1979) do not accept this viewpoint, and propose that the ages of these sites are between 15,000 and 20,000 BP. One of

[1] *Editors' note:* This paper was scheduled for presentation at the Archaeology Workshop of the 15th International Radiocarbon Conference, 14 August 1994, Glasgow, Scotland, but was not delivered because of the author's absence.

the earliest of Mochanov's key sites – Ezhantsy – was dated, at the end of the 1970s, to 17,150 ± 345 BP: IM-459. In my opinion, the most probable age of the earliest Yakutian sites is *ca.* 24,000–26,000 BP. Thus, the general boundary between the early and late stages of the Upper Paleolithic in northeastern Siberia and may be fixed to *ca.* 29,000–24,000 BP.

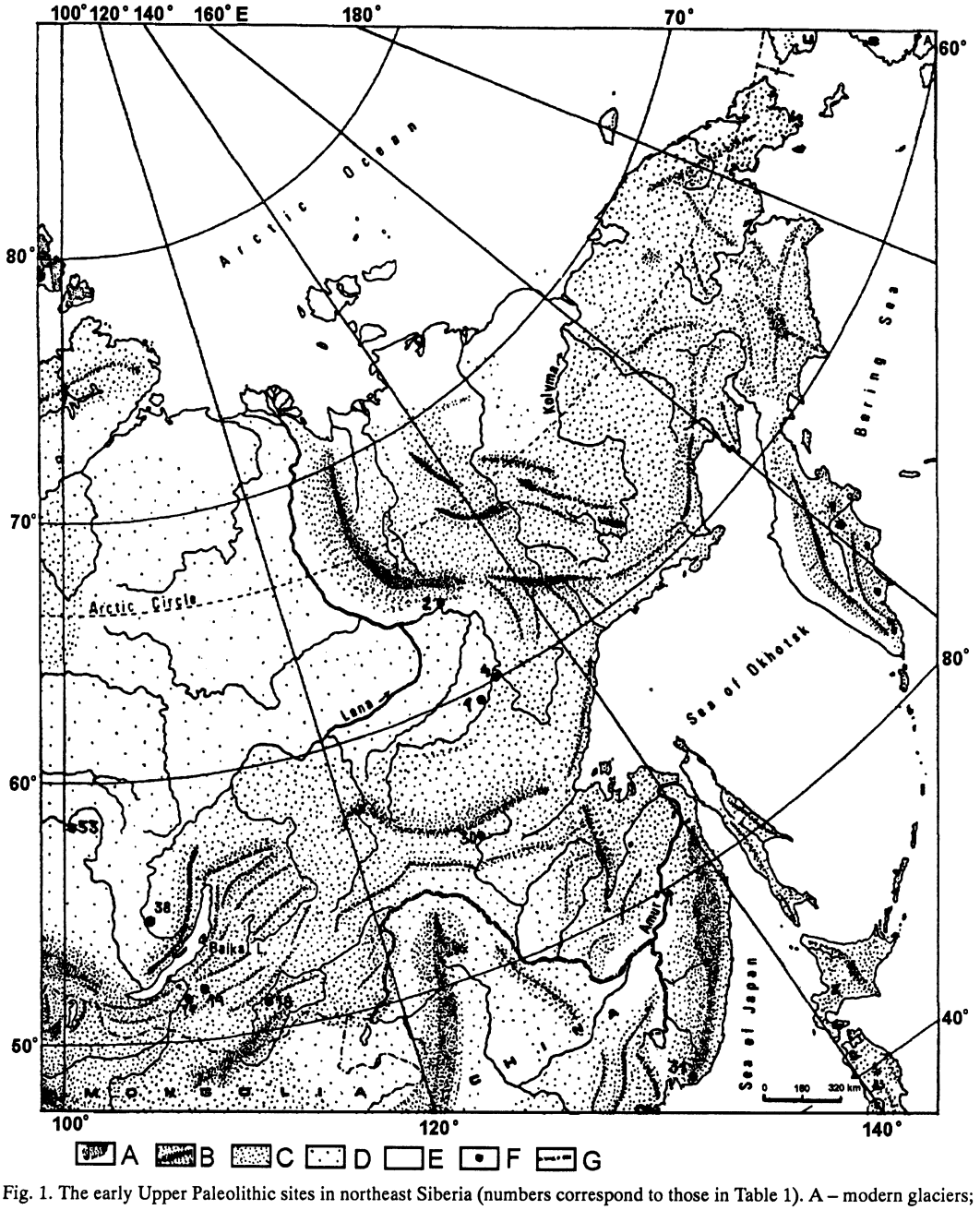

Fig. 1. The early Upper Paleolithic sites in northeast Siberia (numbers correspond to those in Table 1). A – modern glaciers; B – mountain ridges; C – high plains; D – low plains; E – lowlands; F – Paleolithic sites; G – state boundaries.

Late Upper Paleolithic (24,000–10,000 BP)

Many ancient sites in northeastern Siberia relate to the Late Upper Paleolithic, occurring practically all over the study region, except for the Kolyma River basin and Chukotka (Fig. 2). The earliest sites of this cultural stage are Military Hospital 2 and Makarovo 3, containing redeposited material and dating from 31,200–29,700 BP. Most of the dates fall within the period, 24,000–10,000 BP, whereas, in Yakutia, the Ust-Timpton site, Layer 5a is as late as 9400 BP.

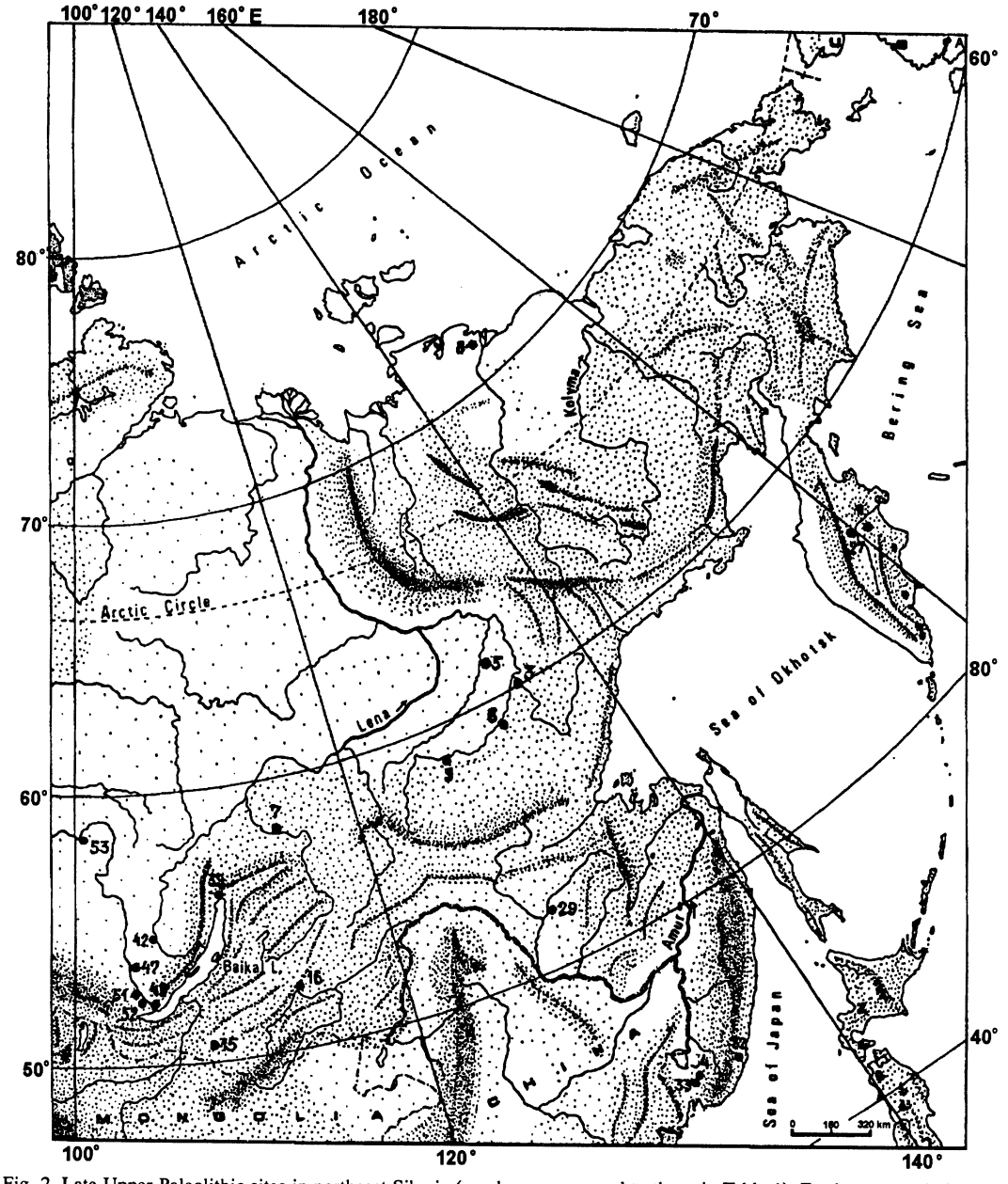

Fig. 2. Late Upper Paleolithic sites in northeast Siberia (numbers correspond to those in Table 1). For key to symbols, see Fig. 1.

Late to Final Paleolithic Transition (15,200–12,400 BP)

The earliest sites associated with the transition from Late to Final Paleolithic are Makarovo 2, Ust-Belaya (Layer 14), Kurla 3 (Layer 1) and Bolshoi Yakor (Layer 7), which range from 15,200 to 12,400 BP.

Final Upper Paleolithic (Mesolithic) (10,000–6000 BP)

Sites of this cultural stage occupy all of northeastern Siberia (Fig. 3).

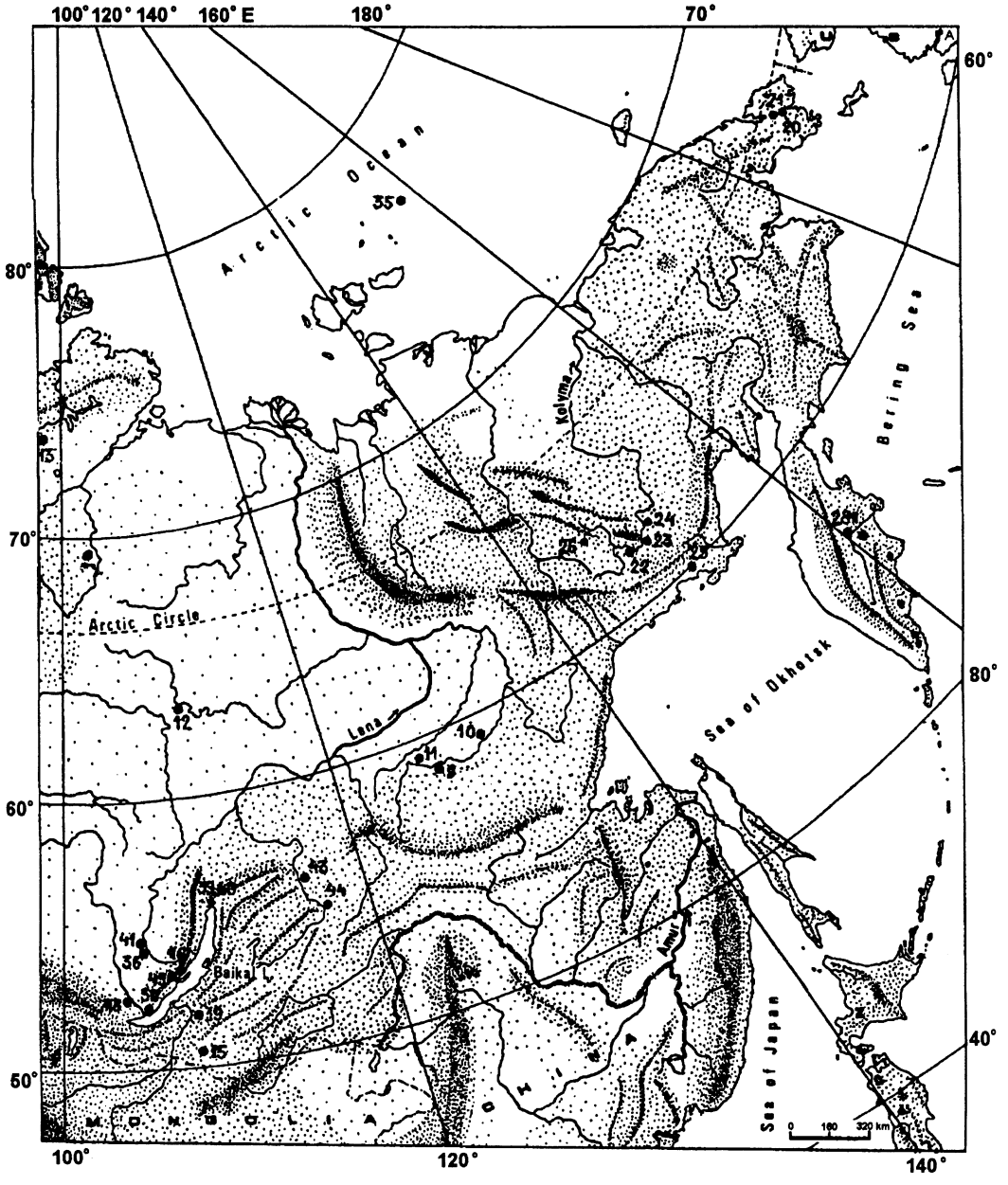

Fig. 3. Final Upper Paleolithic sites in northeast Siberia. For key to symbols, see Fig. 1.

Paleolithic to Neolithic Transition (12,960–5900 BP)

Dating not later than 5900 BP, the younger sites are located in Yakutia, Taimyir Peninsula, and in the High Arctic, are Belkachi, Sumnagin, Tagenar 6 and Zhokhov. The Paleolithic/Neolithic transition in northeastern Siberia is non-synchronous. Taking into account that pottery-making is the most distinctive innovation of the Neolithic, the earliest pottery of the area comes from the Lower Amur River basin – the Gasya site, dating to 12,960 ± 120 BP: LE-1781, and from Trans-baikal, dating to *ca.* 10,000 BP. At *ca.* 8000 BP, pottery appeared for the first time over most of the Russian Far East (Kuzmin 1992a, b). In Yakutia, the Kolyma River basin and Chukotka, the earliest pottery dated to younger than 6000 BP.

TABLE 1. Radiocarbon Dates from the Paleolithic and Mesolithic Sites in Northeastern Siberia

Site no., name*	^{14}C date (yr BP)	Lab no.	Sample material	Context, depth
Yakutia				
1 Ust-Mil 2	12,200 ± 170	LE-953	Wood	Layer A, 1.50 m
	23,500 ± 500	LE-999	Wood	Layer B, 1.80 m
	33,000 ± 500	LE-1000	Wood	Layer C, 2.25 m
	30,000 ± 500	LE-1001	Wood	Layer C, 2.40 m
	35,400 ± 600	LE-954	Wood	Layer C, 2.50 m
	35,600 ± 900	LE-955	Wood	Below artifacts, 4.0 m
2 Ikhine 2	24,330 ± 200	LE-1131	Wood	Layer IIb, 0.95 m
	24,500 ± 480	IM-203	Wood	Layer IIb, 0.90 m
	24,600 ± 380	IM-155	Wood	Layer IIc, 1.40 m
	27,400 ± 800	IM-205	Wood	Layer IIb, 0.90 m
	30,200 ± 300	GIN-1019	Wood	Layer IIb, 0.95 m
	26,600 ± 900	IM-201	Wood	Layer IIc, 1.20 m
	31,200 ± 500	GIN-1020	Wood	Layer IIc, 1.20 m
	26,030 ± 200	IM-239	Bone	Rhinoceros, 1.30 m
	26,500 ± 540	IM-202	Wood	Layer IIc, 1.30 m
	27,800 ± 500	IM-206	Wood	Layer IId, 1.60 m
3 Verkhne-Troitskaya	18,300 ± 180	LE-905	Wood	5.30 m
4 Ezhantsy	17,150 ± 345	IM-459	Bone	Alluvium, 0.60–1.0 m
5 Khaergas	16,000 ± 300	IM-887	Bone	Layer 6
6 Duyktai Cave	12,100 ± 120	LE-907	Wood	Layer VIIa, 1.80 m
	12,520 ± 260	IM-462	Wood	Layer VIIb mammoth, 2.7 m
	12,690 ± 120	LE-860	Charcoal	Layer VIIb, 2.60 m
	13,070 ± 90	LE-784	Charcoal	Layer VIIb, 2.30 m
	13,110 ± 90	LE-908	Wood	Layer VIIc, 3.50 m
	13,200 ± 250	GIN-405	Charcoal	Layer VIIa, 1.60 m
	14,000 ± 100	GIN-404	Charcoal	Layer VIIb, 2.30 m
7 Avdeikha	9200 ± 390	IM-471	?	0.90 m
	12,900 ± 300	GIN-1022	Charcoal	Layer C, 0.90 m
	15,200 ± 300	IM-236	Charcoal	Layer C, 0.80–1.20 m
8 Berelekh	10,600 ± 90	LE-998	Wood	2.53 m
	11,830 ± 110	LU-147	Wood	Above artifacts, 1.6 m
	12,240 ± 160	LU-149	Ivory	2.55 m
	12,930 ± 80	GIN-1021	Wood	2.30 m
	13,420 ± 200	IM-152	Wood	2.53 m
9 Ust-Timpton	6380 ± 80	LE-894	Charcoal	Layer IIIb, 1.20 m
	6570 ± 100	LE-910	Charcoal	Layer IIIb, 1.25 m
	7000 ± 90	LE-895	Charcoal	Layer IVa, 1.50 m
	8900 ± 200	IM-456	Charcoal	Layer Va, 2.00 m

TABLE 1. (Continued)

Site no., name*	^{14}C date (yr BP)	Lab no.	Sample material	Context, depth
	9000 ± 110	LE-832	Charcoal	Layer IVb, 1.75 m
	9400 ± 90	LE-896	Charcoal	Layer Va, 2.00 m
	9450 ± 300	IM-455	Charcoal	Layer Vb, 2.05 m
	10,130 ± 100	LE-897	Wood	Layer VIb, 2.25 m
	10,300 ± 50	LE-920	Charcoal	Between L. V–VI, 2.15 m
	10,340 ± 140	LE-862	Wood	Layer VIa, 2.20 m
	10,650 ± 80	LE-898	Wood	Layer VIb, 2.30 m
	10,740 ± 100	LE-861	Charcoal	Layer VIb, 2.05 m
	11,150 ± 150	IM-454	Charcoal	Layer V (?)
	11,800 ± 200	IM-453	Charcoal	Layer VIII, 2.50 m
10 Belkachi	5900 ± 70	LE-678	Charcoal	Layer 8, 1.80 m
	6250 ± 60	LE-697	Charcoal	Layer 9, 2.00 m
	6720 ± 50	LE-650	Charcoal	Layer 10, 3.00 m
	6750 ± 70	LE-698	Charcoal	Layer 10, 3.10 m
	7430 ± 60	LE-741	Wood	Layer 12, 2.90 m
	7830 ± 150	LE-742	Wood	Layer 13, 3.30 m
	7920 ± 60	LE-743	Wood	Layer 14, 3.70 m
	8060 ± 70	LE-746	Charcoal	Layer 17, 5.10 m
	8110 ± 80	LE-744	Wood	Layer 15, 4.60 m
	8260 ± 80	LE-745	Wood	Layer 17, 4.90 m
	8290 ± 80	LE-760	Wood	Layer 19, 5.50 m
	8360 ± 80	LE-747	Wood	Layer 18, 5.30 m
	8370 ± 80	LE-761	Charcoal	Layer 20, 5.80 m
	8440 ± 80	LE-801	Wood	Layer 21, 5.90 m
	8500 ± 160	LE-740	Charcoal	Close to L. 20, 5.80 m
	8520 ± 80	LE-762	Charcoal	Layer 22, 6.10 m
	9045 ± 210	IM-243	Wood	Layer 23, 6.30 m
	9180 ± 80	LE-763	Wood	Layer 23, 6.30 m
11 Sumnagin	5960 ± 60	LE-795	?	Layer 20, 2.70 m
	6100 ± 50	GIN-296	Wood	Layer 36, 4.45 m
	6200 ± 60	LE-798	?	Layer 36, 4.45 m
	6280 ± 60	LE-797	?	Layer 33, 4.20 m
	6360 ± 60	LE-796	?	Layer 24, 3.10 m
	6900 ± 50	GIN-295	Wood	Layer 20, 2.70 m
12 Ust-Chirkuo	7200 ± 180	IM-475	Wood	Layer 5, 1.20 m
	7600 ± 80	LE-996	?	Layer 6, 0.80 m
	7650 ± 170	IM-481	Charcoal	Layer 8, 1.40 m
	8350 ± 150	IM-476	Wood	Layer 12, 1.80 m
	8740 ± 100	IM-373	?	Layer 10, 1.60 m
	8750 ± 200	IM-479	Charcoal	Layer 10, 1.60 m
13 Tagenar 6	6030 ± 100	LE-884	?	
Transbaikalian				
14 Tolbaga	15,100 ± 520	SOAN-810	Bone	Layer 3
	27,210 ± 300	SOAN-1523	Bone	Layer 4
	34,860 ± 2100	SOAN-1522	Bone	Rhinoceros, Layer 4
15 Studenoye	10,755 ± 140	SOAN-1653	Coal	Layer 13/1
	10,975 ± 135	SOAN-1654	Charcoal	Layer 14
	11,395 ± 100	SOAN-1655	Charcoal	Layer 14
	11,340 ± 180	GIN-2931a	Charcoal	Layer 15
	11,660 ± 400	GIN-2930	Charcoal	Layer 15
	11,340 ± 200	GIN-2932	Charcoal	Layer 16
	11,630 ± 50	SOAN-1656	Charcoal	Layer 16
	12,130 ± 150	GIN-2934a	Charcoal	Layer 17

TABLE 1. (Continued)

Site no., name*	^{14}C date (yr BP)	Lab no.	Sample material	Context, depth
	12,140 ± 150	GIN-2934	Charcoal	Layer 17
	12,110 ± 150	GIN-2935	Charcoal	Layer 18
	12,800 ± 400	GIN-2937	Charcoal	Layer 18
16 Sokhatino 4	11,900 ± 130	SOAN-841	Bone	
	26,110 ± 200	SOAN-1138	Charcoal	
17 Varvarina Gora	17,035 ± 400	SOAN-3053	?	Layer 1
	29,895 ± 1790	SOAN-3054	?	Layer 2
	30,600 ± 500	SOAN-850	Bone	Layer 2
	34,900 ± 780	SOAN-1524	Bone	Layer 2
18 Arta 2	23,200 ± 2000	LE-2966	Charcoal	Layer 3
	37,360 ± 2000	LE-2967	Charcoal	Mousterian(?), Layer 4
19 Oshurkovo	10,900 ± 500	GIN-302	Charcoal	Layer 3
Chukotka				
20 Chelkun 4	8150 ± 450	MAG-719	Charcoal	
21 Ananaiveem	8410 ± 80	LE-2791	Charcoal	
Kolyma River Basin				
22 Siberdik	7865 ± 310	MAG-184	Charcoal	Layer 3, 0.90 m
	8020 ± 80	KRIL-250	Charcoal	Layer 3, 0.80–0.90 m
	8130 ± 100	MAG-606	?	Layer 3, 0.80 m
	8480 ± 200	KRIL-249	Charcoal	Layer 3, 0.80–0.90 m
	9700 ± 500	MAG-1019	?	Layer 3, 1.00 m
	13,225 ± 230	MAG-916	?	Layer 3
23 Kongo	8080 ± 500	MAG-406	?	Layer 1
	8600 ± 220	MAG-196	Charcoal	Layer 1, 1.60 m
	8700 ± 400	MAG-595	?	Layer 3, (?)
	8850 ± 500	KRIL-315	Charcoal	Layer 2, 1.00 m
	9020 ± 510	KRIL-313	Charcoal	Layer 2, 1.00 m
	9470 ± 530	KRIL-314	Charcoal	Layer 2, 1.20 m
24 Maltan	7490 ± 70	MAG-183	Charcoal	Layer 2, 0.40 m
25 Uptar	8260 ± 330	MAG-1262	Charcoal	0.10-0.35 m
26 Zima	7070 ± 60	MAG-1260	Charcoal	
Kamchatka				
27 Ushki 1	9750 ± 100	MAG-637	Charcoal	Layer 7
	10,360 ± 220	MAG-401	Charcoal	Layer 6
	10,360 ± 350	MO-345	Charcoal	Layer 6, 1.70 m
	10,760 ± 110	MAG-219	Charcoal	Layer 6, 1.80 m
	13,600 ± 250	GIN-167	Charcoal	Layer 7, 2.20 m
	14,300 ± 200	GIN-168	Charcoal	Layer 7
	21,000 ± 100	GIN-186	Charcoal	Layer 6 (?)
28 Ushki 5	8790 ± 150	MAG-215	Charcoal	Layer 6
Russian Far East				
29 Ust-Ulma	19,350 ± 65	SOAN-2619	Charcoal hearth	
30 Filimoshki	20,350 ± 850	SOAN-825	Peat	Redeposited
31 Geographical Society Cave	32,570 ± 1510	IGAN-341†	Bone	Horse, mammoth, 0.60–0.80 m
32 Suvorovo 4	15,105 ± 140	AA-9463†	Charcoal	0.25–0.30 m
	15,300 ± 140	Ki-3502†	Charcoal	0.25–0.30 m
33 Gorbatka 3	13,500 ± 200	SOAN-1922†	Humic acids	Below artifacts
34 Ilistaya 1	7840 ± 60	Ki-3163†	Charcoal	
High Arctic				
35 Zhokhov Island	7450 ± 200	LE-4534	Wood	

TABLE 1. (Continued)

Site no., name*	^{14}C date (yr BP)	Lab no.	Sample material	Context, depth
	7850 ± 40	LU-2433	Wood	
	7870 ± 60	LU-2432	Wood	
	7930 ± 40	GIN-6400	Bone	
	7940 ± 170	LE-4533b	Charcoal	
	8020 ± 50	LU-2499	Wood	
	8200 ± 40	GIN-6399	Wood	
	8560 ± 180	LE-3527	Charcoal	
	8790 ± 90	LU-2502	Wood	Below artifacts
Upper Lena River and Lake Baikal				
36 Makarovo 2	11,400 ± 500	GIN-480b	Charcoal	Layer 3
	11,860 ± 200	GIN-480a	Charcoal	Layer 3
	11,950 ± 50	GIN-481	Charcoal	Layer 4
37 Makarovo 3	30,000	GIN-7067a	Bone	Average date
	31,200 ± 500	GIN-7067b	Bone	
38 Makarovo 4	27,005 ± 370	AA-8879a	Bone	Layer 6a
	39,340 ± 1300	AA-8879b	Bone	Layer 6
39 Kurla 3	13,160 ± 350	SOAN-1396k	Bone	Layer 1
	15,200 ± 1250	SOAN-1396	Charcoal	Layer 1
	24,060 ± 5700	SOAN-1397	Charcoal	Layer 2
40 Kurla 6	14,150 ± 960	SOAN-1398	Charcoal	Layer 1
41 Shishkino	7430 ± 230	GIN-303a	Charcoal	
	8000 ± 700	GIN-303b	Charcoal	
	8270 ± 160	GIN-303c	Charcoal	
42 Shishkino 8	21,190 ± 175	AA-8882	Bone	
43 Bolshoi Yakor	10,100 ± 100	IM-920	Charcoal	Layer 3A
	10,070 ± 540	LE-4173A	Charcoal	Layer 4A
	10,320 ± 150	IM-968	Charcoal	Layer 4A
	10,400 ± 650	LE-4172	Charcoal	Layer 6
	12,400 ± 150	LE-4172A	Charcoal	Layer 6
	12,330 ± 250	GIN-6466	Charcoal	Layer 7
44 Nizhnyaya Dzhilinda	6720 ± 80	LE-1957	Charcoal	Layer 4
	7230 ± 40	GIN-4051	Bone	Layer 5A, burial
	7880 ± 80	LE-1955	Charcoal	Layer 5A
	7580 ± 80	LE-1956	Charcoal	Layer 5
	8980 ± 80	LE-1951	Charcoal	Layer 6
	11,280 ± 80	LE-1953	Charcoal	Layer 6
	11,280 ± 120	LE-1952	Charcoal	Layer 6
45 Ityirkhei	7300 ± 290	IM-402	Charcoal	Layer 7
	8010 ± 100	GIN-4882	Bone	Layer 8
46 Sagan-Zaba	7630 ± 45	SOAN-1573	Bone	Layer 4
	8775 ± 40	SOAN-1574	Bone	Layer 5
Upper Angara River Basin				
47 Igeteisky Log	21,260 ± 240	LE-1590	Charcoal	Layer 4
	23,500 ± 250	LE-1592	Charcoal	Layer 4
	23,700 ± 1100	IM-405	Charcoal	Layer 4
	24,400 ± 400	GIN-5327	Bone	Layer 6
48 Ust-Belaya	8960 ± 60	GIN-96	Bone	Layers 3–4
	9850 ± 500	GIN-483	Charcoal	Layer 8
	11,930 ± 230	GIN-5329	Bone	Layer 14
49 Military Hospital 2	29,700 ± 500	GIN-4440	Bone	Redeposited (?)

TABLE 1. (Continued)

Site no., name*	^{14}C date (yr BP)	Lab no.	Sample material	Context, depth
50 Verkholenskaya Gora 1	12,570 ± 180	MO-441	Charcoal	Layer 3
51 Buret	21,190 ± 100	?	Bone	
52 Malta	14,750 ± 120	GIN-97	Bone	Badai horizon
	20,700 ± 150	GIN-7709	Bone	
	21,000 ± 140	GIN-7706	Bone	
53 Ust-Kova	14,220 ± 100	LE-1372	Charcoal	Layer 4
	23,920 ± 310	KRIL-381	Charcoal	Layer 5
	28,050 ± 670	SOAN-1875	Charcoal	Layer 7
	30,100 ± 150	GIN-1741	Charcoal	Layer 7
	> 32,865	SOAN-1874	Charcoal	Layer 7

*Numbers correspond to numbers in Figs. 1–3.
†Also reported in Kuzmin *et al.* (1994), which precedes this article.

CONCLUSION

From the available data, it is possible to draw a preliminary conclusion that ancient people occupied western Beringia (the Indigirka River basin and Kamchatka) *ca.* 12,000–14,000 BP, at which time they could have migrated across the Bering Land Bridge. The data presented here form the foundation for a proposed Radiocarbon Database of Paleolithic sites in Siberia and the Russian Far East. Because of the rapid accumulation of new dates, it is necessary to plan for a sustained supplement to the database. For a detailed discussion of the general database, see Kra (1988).

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