

NEW WORLD MIGRATION ROUTES

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Like Alaska, northeastern Asia underwent glaciation only in the mountain regions even during the maximum extension of the ice sheets, while the final glaciations are thought to have been confined to higher elevations or never to have spread far from their mountain sources.¹ The terminal stage, possibly equivalent to Valders, was represented only by scattered remnant glaciers which have since completely disappeared. Unlike Alaska, however, the adjoining half of the continent was very largely ice-free, and at no time was the way blocked between Bering Strait and this unglaciated hinterland — at least via the route lying south of the ice. During the more moderate final glaciations a northern route along the arctic shore was certainly available as well, and conditions in general would have been more favorable to the presence in this area of either animals or man.

We know from the biologists that a land connection must have existed between Asia and Alaska, although they cannot tell us precisely when. However, it is easy to demonstrate that a lowering of present sea level by only 120 feet would create a dry passage, not in Bering Strait itself but via St. Lawrence Island (Byers, 1957). And if we accept Russell's recent calculation of a Wisconsin sea level of minus 450 feet (Russell, 1957), we are confronted with a vast, level, ice-free plain extending both north and south of the strait — exactly the situation postulated by Hulten on the basis of his widely-respected studies of plant distributions (Hulten, 1937). The best estimates as to when this intercontinental land connection terminated run in the neighborhood of 11,000 to 8,000 years ago, but we are safe in assuming that it existed during most of the phases of Wisconsin glaciation as well as at earlier Pleistocene stages.

Thus, even at times when Alaska may have been an isolated pocket walled off by ice barriers from the rest of North America, it was linked with ice-free Asia. In fact, from the standpoint of biology and human geography, it would perhaps be more accurate to think of Alaska as forming part of Asia at such times.

We must make passing reference to the Aleutians if only to dismiss them from the picture. The depth of water west of Attu rules out the possibility of any former land connection in this area. There is no basis for postulating the presence of pack ice as a substitute, and in any case, as Skarland (1954) has pointed out, long distance travel over sea ice is highly improbable. The distances involved, and the hazardous conditions of navigation, debar any movements by water until primitive seafarers had reached a high level of skill; and even then, we have evidence for none but the most sporadic and conjectural contacts in very recent times (cf. Chard, 1959). We must note also that the Aleutian Islands were heavily glaciated.

¹For the most recent authoritative map of Siberian glaciations, see the *Bol'shaya Sovetskaya Entsiklopediya*, 2nd edition, Volume 47 (1957), facing page 240.

Let us now examine in more detail the routes available to early man between ice-free Asia and the Bering land bridge. What I will term the southern route begins near the mouth of the Amur River, skirts the precipitous western and northern shores of the Sea of Okhotsk where the coastal ranges run out to the ocean, and then cuts overland to Bering Sea across a low-lying gap that I propose to call the Koryak Corridor. These Okhotsk coastal ranges form a formidable barrier that has tended from Neolithic times to restrict contact with the interior and to channel movements along the shore. And we may well assume that they played a similar role in earlier eras as well. Under present conditions this route would hardly appeal to early man: it is comparatively difficult for people without boats, and most of the known movements are associated with maritime cultures or, in very recent times, with reindeer-riding peoples. Except for localized and highly seasonal fish runs, the Okhotsk coast offers little sustenance to a pedestrian group. Moreover, the worst terrain conditions are located at the very start of the route, immediately north of the Amur, and would probably effectively discourage any attempt at northward movement following the coastline. However, a drop in sea level of only 100 meters, well below Russell's Wisconsin figure, would change the picture completely and expose a relatively level coastal shelf 20 to 30 or more miles in width, providing a habitat for game animals and an easy path for man (cf. Chemekov, 1957). So sharp a contrast in feasibility has convinced me that any significant movements via this southern route must have been confined to periods of glaciation with attendant low sea levels. And we know that the way was never barred by ice. A corollary to this, of course, is that the traces of man's presence along this route must be largely buried beneath the sea. The most promising area in which to find them would be what I have called the Koryak Corridor—that low-lying ice-free short-cut from the head of the Okhotsk Sea to Anadyr Gulf. There is no certainty, of course, that early man did not detour south around the coasts of Kamchatka but still it would seem that our best chance of finding sites above water is along this possible overland section.

The low sea level prerequisite for this route might of course have been affected by isostatic movements for which we have inadequate data. But owing to the relatively small extent of the final glaciations in this area, we are probably safe in assuming such movements to have been of only minor consequence at that time.

By analogy with Alaska we may assume that climatic and environmental factors were not unfavorable to the presence of animals or man in ice-free areas of northeastern Siberia during glacial periods, and especially the final ones with which we are primarily concerned. During the latter, vegetation may have been much like the present on available evidence. Even at the time of maximum glaciation, the Okhotsk coastal route at the worst probably experienced conditions not inferior to those prevailing today in inhabited portions of Greenland, both areas being tempered by the proximity of the ocean. The Bering Sea region may in fact have enjoyed a relatively mild climate whenever land

bridges blocked off the arctic waters and allowed it to receive the full benefits of warm currents.

It may be asked whether the Kurile Islands would not provide an alternate southern route from the Amur region to Kamchatka and Bering Sea. It is true that Hokkaido was linked to the continent via Sakhalin at various times during the Pleistocene, but the depths of water between the islands of the Kurile chain rule out a land connection in the latter area, nor is pack ice a likely substitute here. Moreover, there is evidence that the Kuriles were subjected to local glaciation. Human occupation or use of the islands had to await the development of maritime cultures, and on present evidence this came very late in the historic scene (cf. Chard, 1956).

The other route by which man or elements of his culture could reach the New World ran from the mouth of the Lena River eastward along the arctic shore to Bering Strait. Even with modern sea levels this is a continuous strip of lowland that has provided free movement to peoples in both prehistoric and historic times. A lowering of the shallow adjoining seas by as little as 50 meters would create a vast coastal plain to complicate matters for the archaeologist. Thus we probably cannot hope to find more than a small fraction of the remains which any early wanderers might have left. The eastern half of this route may have been blocked during the maximum glaciation, but was almost certainly open during Wisconsin times, especially the final phases. Unlike the southern route, it would have been not only feasible but inviting during interglacial periods. At such times, however, the final step to Alaska would have involved surmounting a water barrier at the strait. The climate along this barren arctic shore in times of glaciation, on the other hand, was surely inferior, though perhaps offset by the vastly greater game supply on these extensive lowlands. As it is, we have at present no evidence that would suggest that this northern route was used in preceramic times (Chard, n.d.).

Archaeological reconnaissance along these probable migration routes in Siberia has just begun and has been carried on primarily in terms of present shore lines and landscapes. It is hardly surprising therefore that no traces of the early migrants have yet been discovered. As I have indicated, the majority of such remains must be under the ocean, but there are doubtless accessible sites that await the searcher who looks in the right places. The great quantity of mammoth remains for which arctic Siberia is famous give hope that some day we shall find traces of the hunters who must have pursued them. After all, we must not forget how few traces of early man have come to light as yet in Alaska despite two decades of diligent search.

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