

## Bering Sea Land Bridge

No one ever walked across the Bering Sea land bridge from Asia to North America. The minor controversy over when suggests some 11,000 years ago. Much data suggests 7000 years ago. All the dates measured by the anthropologists are correct. The concept that they walked is wrong; the answer lies in the data scientists have collected from 5 different fields.

The data comes from anthropology, geography, geology, oceanography, and two branches of physics: astronomy and radioactivity. I start with the latter.

Radiocarbon dating is great for anthropology but carbon 14 (C14) is too radioactive for paleontology and archeology. Most carbon is C12, but C14 is generated in the atmosphere by radiation from space. The level of C14 in the air is constant, N13 gets altered to C14 at a fixed rate. Decay balances it at the same rate. Chemically, C12 and C14 are identical. So, when plants grow they contain the same ratio of the two. They contained the same ratio thousands of years ago as they do today. But the C14 decays and the ratio declines. Measuring the ratio, tells us when the plant grew.

The limit on usefulness of radiocarbon dating is about two half-lives, 2 times 5730 years or about 12000 years. One reason is that C14 is rare, and the ratio is small. The other reason is the measuring equipment is always exposed to the radiation from space and from earth, too. Older C14 dates are not necessarily wrong but suspect.

## Anthropological Dates

Perhaps I should start by saying, I did not collect any of the data. Three statements follow:

1. Much data suggests the land bridge was used 7000 years and some data suggests 11000. There is a smattering of intermediate data.
2. Human population increased a lot in the 4000-year interim.
3. If the land bridge was in continuous use from 11000 to 7000 years ago, there would be a continuous curve in the amount of data for those years. There isn't. So, while the population was growing, the migration wasn't.

I'm going to give you the answer, but the explanation will take the rest of this report.

The Pacific Ocean at the land bridge was frozen. This tells us, no one

walked across the land bridge. It was over a 1000 miles with no food, no fuel, and no shelter. Humans migrated along shore; no shore, no migration. Boats would have been required to haul possessions. Probably, skin boats.

Others have speculated that the Pacific was frozen. This is my version.

#### Oceanographic and Geographic data

Ocean currents flow north past Japan curve east past the Aleutians, and south past Washington, Oregon, etc. Currently, the water depth north of the Aleutians is about 200 feet (roughly); we know this because Opelia crabs (snow crab) are fished there. The ocean level sank 100 feet (roughly) and the ocean currents slowed considerably. The main current was south of the Aleutians. The Pacific froze along the shore of the land bridge. Only thing left to explain is the time table. Enter astronomy.

#### Astronomy

In the last 100,000 years, 4 ice ages occurred. The current rate of precession is 23,500 years. How long this will remain is unknown. But, we will use 24,000 which nicely compares with our 12-month year at 2000 years per month. We will call the 24,000 a glacial year. Also, we change the week to about 7.6 days so there are 4 weeks to each month. A glacial week is 500 years.

Before going further there are a few things about the background of earth history worth mentioning. The current precession has the north pole pointing at a star we call the North Star, but that isn't always true. The North Star is a Cepheid Variable, which is why it is sometimes easy to see, but usually not that bright. The precession of earth will sweep an imaginary circle in the sky and in about 24000 years will again point to the North Star.

As the earth precesses, the tip of earth axis changes. Right now it is about 23 degrees and is the reason the Arctic and Antarctic circles are at 23 degrees on our maps. This number will have to be revised as the precession will reduce it and accordingly, the reduction will lead us into the next ice age. As a matter of fact, we are already 500 years into the next ice age. So, why isn't it getting colder. First, more background.

The orbit of the earth around the sun changes, too. Other factors also combine to alter the precession. The more elliptic the orbit the longer the ice age and affect on life has been devastating. The continental shelves were built by an ice event that lowered the ocean level by 1000 feet. Heat during Jurassic and Cretaceous periods raised ocean levels

600 feet higher than today. Assuming, an ocean level drop of 100 feet is not an exaggeration; it might be too small.

Ok, now we are ready to draw some conclusions.

For Comparison, we align our year at maximum tip toward the sun in the northern hemisphere (first day of summer), with the maximum tip of precession of the glacial year (500 years ago). Second and most important is to recognize that this is more than a comparison, it's the same thing in slow motion. Glacially, it is July first.

Let's make some more observations. The first day of summer is not the hottest day. It's about the end of July; 5 weeks after the beginning of summer. Glacially, that's 2500 years or 2000 years from July 1st. Even though the next ice age has started it will continue to get warmer for another 2000 years.

Let's do the winter now. The coldest day of winter is not the first day of winter. It's about the end of January; 12000 years ago. But, when does the ice get thickest? Mid February, ask any ice fisherman, I'm one. That's 10000 years ago. And when does the ice melt. At my house, mid-March to mid-April. Glacially, about 6000 to 8000 years ago. It is a good guess the migration got rolling again at 7000 years ago, when Pacific reopened. In this case, the 7000-C14 data indicates both when the ice melted and when the migration restarted.