

cusing attention on this important problem of the West. The outlook for future stabilization of the range industry is, therefore, encouraging.

A Prehistoric Hitch-Hiker

By W. A. ROCKIE

Soil Conservation Service, Spokane, Washington

The title of this paper may have caused wonder regarding its character but after repeated study of the set of known facts, and then the evolution of a theory to fit these facts, the entire incident reported here still impresses the writer as a fairy tale.

On February 28, 1938, I, accompanied by four other men, was making a study of the type of material in a road cut $2\frac{1}{2}$ miles north of Touchet, Washington, on the highway toward Eureka. This road cut (25 feet deep) through the Quaternary sediment is characterized by fine-textured sandy and silty deposits, but shows occasional rocks of different sizes, types and materials.

One small rock was dug from the vertical wall about $6\frac{1}{2}$ feet above the base of the cut. It proved to be a dark-colored flat slab of marble about 4 x 5 inches and about $1\frac{1}{2}$ inches thick. Mr. H. M. Wanser, one of the party, began digging at another rock which he saw embedded a few inches from the one found by the writer. The second slab proved to be about 4 x 4 inches and of the same thickness. The two rocks appeared so strikingly similar that the writer, instead of throwing them away after a hasty examination, kept them. Later and closer inspection showed not only that they were of identical material, but that they were two separated portions of what had once been a single slab of rock.

These two portions of this rock were found several inches apart, at the same level, with both flat slabs lying in a horizontal position in the Quaternary sediments.

When found, the two rocks did not

have the matching faces toward each other, and except for an outcropping corner, they were entirely encased in the massive sandy deposit.

The rock (two pieces) is sufficiently soft that it would quickly show the slightest erosion or weathering, but there is no evidence of protracted wind, water or glacial scouring either on its sides or edges. Its surfaces and edges are so nearly unaltered from their condition when first broken from the parent ledge or cliff, as to indicate that while encased and carried in the ice, it was not rubbed or ground against any rock.

Since the two faces which exactly match are absolutely unworn, while the other faces appear slightly less raw (weathered but positively not rounded) it appears that this one rock became two after it was solidly encased in the ice. Had the break occurred before, all of the faces would show similar age of weathering. It further appears that the two pieces remained contiguous until a few seconds before they dropped to the point where found.

The rock (two pieces) appears as though it must have broken from some cliff in northern Washington, or northern Idaho, in British Columbia or elsewhere to the glacierward, fallen onto the snow, been buried in that snow until it was compressed into ice, then transported southward in the Continental Ice-Sheet, the particular ice that contained this rock sooner or later breaking off from the parent body, floating either in lake or stream or in combination of both lake and stream, far beyond the front line of glaciation,

to that portion of the prehistoric lake site at which the two pieces were recently found.

The Quaternary sediments at this point are of lacustrine origin, and the lake in which these two rocks were deposited as judged by the usually fine-textured nature of the deposit, must have been rather large and the deposit at this point certainly occurred in quiet waters. In order for these two parts of one slab of rock to arrive (considering their condition when found in this still-water deposit), they must have been held in the grip of a floating berg from the glaciers to the northward, must have been released (vertically above their location when found) by the melting of that ice and then they must have dropped from the ice raft which had served as their vehicle of transportation.

In an attempt to fit the evidence found into a logical series of happenings, the following outlined sequence of events has been imagined:

1. A slab broke from its parent cliff somewhere in the glaciated country northerly from Spokane.
2. This slab appears to have fallen into a snow bank at the foot of that cliff.
3. The snow bank was gradually compressed into ice.
4. This ice was a part of the Continental Ice-Sheet that covered much of the United States and Canada, or it was one of the out-flowing ice spigots of that ice-sheet which may have appeared as a typical valley glacier.
5. The ice moved forward over a period of thousands of years until that portion of the ice-mass that contained this rock was part of the floating front of a glacier emptying into a lake or stream.
6. Probably during the period when this ice raft was an embedded part of a moving glacier, some strain or stress cracked the rock into two pieces, but both pieces still remained imprisoned in one cell.
7. The surrounding cracked ice refroze into a solid brick.
8. An iceberg or ice raft (probably rather large because it traveled at least several hundred miles) containing this rock broke from the parent mass and floated away.
9. Traveling either by lake or possibly also partly by stream, the berg or raft drifted southward.
10. It was constantly decreasing in size due to melting.
11. At a point directly above that where the rock was found, the raft was floating on the quiet deep water of a lake when the particular ice which held the rock in captivity melted, releasing the rock.
12. The two pieces of the rock settled to the bottom of the lake, fluttering downward and coming to rest a few inches apart on the lake floor where the glacial flour (which the waters of this lake undoubtedly carried) soon encased and buried the two pieces until the highway was cut through this deposit in recent years.

THE FAIRY TALE IS ENDED.