A STRUCTURAL TRANSECT ACROSS THE NORTHEASTERN BROOKS RANGE, ALASKA*

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ABSTRACT

A retrodeformable cross-section has been prepared based on detailed mapping from the Sadlerochit Mountains south across the Brooks Range to the continental divide. Complex imbrication and folding in the Lisburne and Sadlerochit Groups at the southern end of the transect appear to be an eastward continuation of structures typical of the central Brooks Range. Broad anticlines exposing pre-Mississippian rocks overlain unconformably by the Mississippian Kekiktuk Conglomerate characterize structure to the north. These anticlines decrease in wavelength and amplitude north of the Franklin Mountains in the front ranges, including the Sadlerochit and Shublik Mountains. Shorter wavelength chevron folds and few faults occur in the Mississippian Lisburne and Permian-Triassic Sadlerochit Groups, separated from underlying rocks by a detachment horizon and the commonly penetratively deformed Mississippian Kayak SHale. The broad anticlines are interpreted to be fault-bend folds in a duplex with a floor thrust in the pre-Mississippian rocks, and a roof thrust in the Kayak Shale.

Younger structurally higher units are preserved mainly in the northern front ranges, where structural relief is less. Structures in the Shublik and Sadlerochit Mountains indicate that faulting stepped up to the Triassic Shublik and Jurassic Kingak Formations, then stepped up again through the Lower Cretaceous unconformity (LCU) and Kemik Sandstone into the Cretaceous Pebble Shale and Colville Group. Local duplexes formed between these two detachment levels, as seen in a klippe northeast of the Sadlerochit Mountains. The duplex in pre-Mississippian rocks grew northward over time, resulting in faulting and folding of the two detachment horizons in the Mesozoic section. Shortening across the 95 miles of the transect is 25-28 miles (27-29 percent), as determined from a restored cross section.

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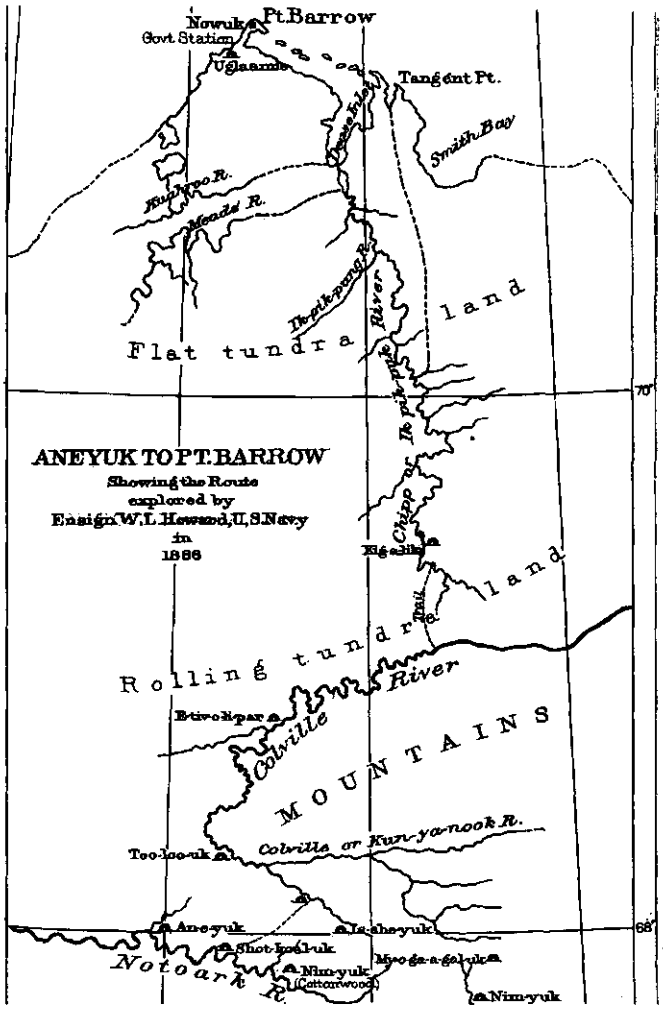
EXPEDITION TO POINT BARROW UNDER ENSIGN HOWARD.

In accordance with the arrangement made with Owpuk at Issheyuk on my visit to that place in December, I started a party out on April 12 to join the natives at Issheyuk and go with them down the Colville to Point Barrow. Ensign Howard who accompanied me on my trip, was placed in charge of the expedition and I assured him that I would not leave the country until I knew that he was all right; and that I would leave provisions at Fort Cosmos in case he should return after our departure. The trip occupied ninety-six days, from April 12 to June 16, and the account of it is here given in his own words.

April 12, 1886, I left Fort Cosmos with Price (C. M.), Riley, the interpreter, and two natives, en route to Point Barrow.

May 3, in camp waiting for four more sleds from the mountains. These new arrivals were strangers to me. I was advised by a native to distrust Owpuk; this was the only instance I ever met of one native speaking ill of another. May 4, under way, and made about fifteen miles N. by W. (p. c.) avoiding long bends in the river by crossing the tundra where the women gathered berries. These ripened in the fall just as the snow comes; they then freeze on the bushes and are thus preserved until the snow melts down in the spring. We gathered a great many and I found them especially good, their effect being that of a mild laxative. During the forenoon passed a *hill* about 500 feet elevation with out-croppings of coal. On the sides of this hill beyond the coal were also found large pieces of a substance called wood by the natives; it was hard, brittle, light brown in color, very light in weight and burned readily, giving out quantities of gas. This material was scattered about in all shapes, sizes and quantities. The snow and ice made it impossible to climb and dig; a specimen was preserved. May 5, under way, and made ten miles N. by W. (p. c.) when went into camp on account of strong gale from the westward which blew so hard the dogs could not pull against it. The driving snow covered my glasses, making it impossible to see, so took them off and in the evening suffered from an attack of snow-blindness that



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Alaskan North Slope Geology, Volumes I and II, 1987