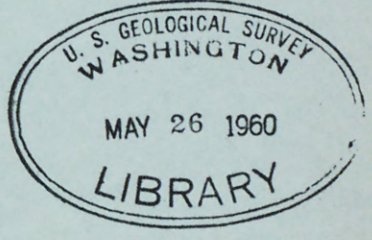


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By

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and

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November 1950

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REVIEW OF THE STRATIGRAPHY AND STRUCTURE OF THE GUBIK ANTICLINE

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INTRODUCTION

At the direction of Ralph L. Miller, a special study was made of the part of the Gubik anticline east of the Colville River. The purpose of this study was twofold; first, to examine the field evidence bearing on east plunge, second, to attempt to establish the continuity of the anticlinal axis from the Colville River to the Anaktuvuk River. The results of this study and a summary of results of the study of part of the anticline west of the Colville River by Stefansson and Thurrell¹ are presented below.

STRATIGRAPHY

Within the area outcrops adjacent to the probable position of the axial trace of the Gubik anticline are limited to the part of the anticline west of the Colville River, the bluffs along the west bank of the Colville River, and the bluffs along the west bank of the Anaktuvuk River. The entire area between the Colville and Anaktuvuk Rivers in the vicinity of the axis of the Gubik anticline is overlain by deposits of stream gravel. These gravel deposits probably average 30 to 50 feet in thickness. At the Anaktuvuk River the bedrock has been largely obscured by the slump of these gravels. This factor coupled with the nonresistance of the bedrock largely limit the information and the reliability of the information obtainable from the Anaktuvuk bluffs.

At the Colville River the rock exposed near the axis of the Gubik anticline is zone I. The color of the bluffs is banded yellow, buff, light gray, yellow red, and pink. On the whole the section is poorly consolidated. It consists largely of clay, silt, and shale; the entire section is very bentonitic. Coal (bony) and tuff are very common. Sandstone beds are not numerous. They occur as either thin (as much as 5 feet thick) beds, usually fairly well consolidated, slabby, fine- to medium-grained, silty, and gray in color; or as thicker beds, loosely consolidated, light gray, fine- to medium-grained, and friable. Most of the thicker beds are bentonitic and some are cross-bedded. Ironstone lenses and nodules are common, especially in the sandstone beds. The exact position of the zone H-zone I contact shown on plate 1 was determined by Stefansson and Thurrell² on the basis of lithology, degree of consolidation, and color

¹ Stefansson, Karl, and Thurrell, R. F., Stratigraphy and structure of the area of the Colville River north of Umiat, Alaska: U. S. Geol. Survey Navy Oil Unit Report No. 12, 1948.

² Stefansson, Karl, and Thurrell, R. F., Op. cit.

anticline on the Anaktuvuk River. These have been studied by Bergquist, who reports that the faunules do not contain diagnostic microfossils, but that they have closer affinities to the zone I fauna from the Sentinel Hill core test than to any zone H fauna.

It therefore is highly probable that no rock stratigraphically lower than zone I is exposed near the axis at the Anaktuvuk River. If this inference is correct the probability of closure is increased.

STRUCTURE

The structure contours shown on the west part of the Gubik anticline were drawn by Stefansson and Thurrell^{6/} on a persistent 15-foot conglomeratic sandstone. This conglomeratic sandstone is about 2,800 feet stratigraphically above the top of zone F and approximately 1,500 feet below the collar of the Sentinel Hill core test. The anticline plunges west. Plunge of at least 40 feet is established, but it is probably much greater. This west plunge was substantiated by recent geophysical studies.^{7/} In the area between the Colville and Anaktuvuk Rivers no structural information is available. There is no definite assurance that the anticlinal axes observed at the Colville and Anaktuvuk Rivers are in reality expressions of the same anticlinal trend; however, judging from regional trends and the similarity of lithologic units it is highly probable that only one anticline is represented.

At the Anaktuvuk River such surface data as are available indicate a plunge of the anticline to the east. The loosely consolidated character of the rock, the possibility of slump, and the presence of complex cross bedding make the strikes depicted on plate 1 questionable. If slump were a factor in these readings it would introduce an easterly component of dip. It should be noted, however, that only where the bedrock appears to be in place were the strikes and dips recorded. The generally constant readings obtained, together with the east dip components evident on the north flank make the presence of eastward plunge a strong probability.

Judging from topographic features and to some extent from the attitudes of the gravel terraces, it is the opinion of the writers that the Gubik anticline is similar in east-west configuration to the Umiat anticline. The structural high should be located between the Chandler and Anaktuvuk Rivers and is probably closer to the Anaktuvuk.

^{6/} Stefansson, Karl, and Thurrell, R. F., Op. cit.

^{7/} United Geophysical reports of Party 144, 1950.