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Department of the Interior

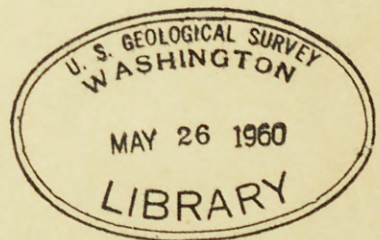
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Geological Investigations

Naval Petroleum Reserve No. 4

Alaska



Special Report No. 9

THE DRIFTWOOD ANTICLINE

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THE DRIFTWOOD ANTICLINE

By

William A. Fischer

November 1949

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### INTRODUCTION

Recent interest in the anticlines near the headwaters of the Utukok River has prompted the issuance of two special reports. This, the first of the two reports, deals with the Driftwood anticline, the second will consider the Awana anticline and the western part of the Carbon Creek anticline.

At present, only trimetrogon photography is available in this area. This limits the accuracy and completeness of the photographic studies. Vertical photos were flown this summer but they will probably not be available for study before the November meeting. At such time as they are received a more thorough photo investigation will be made.

### FIELD INFORMATION

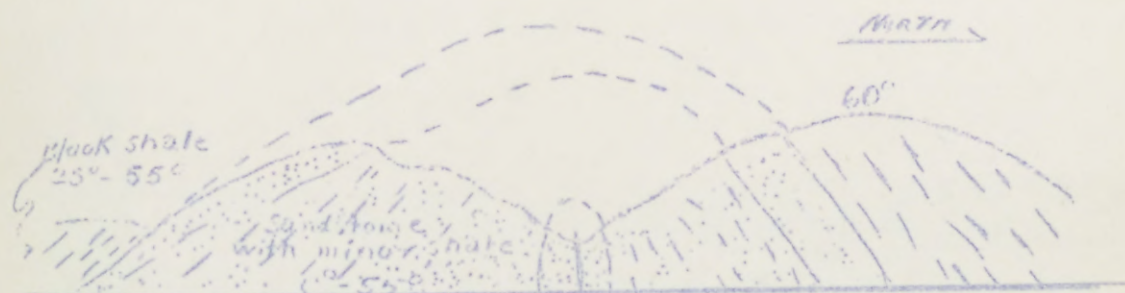
The Utukok River was traversed in the summer of 1947 by R. M. Thompson and W. L. Barksdale. The following pertinent statements on the geology of the Driftwood anticline have been extracted from their field notes. These are direct quotations except where otherwise indicated. Comments in parenthesis are added where necessary.

Thompson, R. M., Field Notebook, Pg. 14

"The tight anticline that runs east of Camp #2 disappears under a large flat terrace ten miles or so east of the (Utukok) river. This terrace is free from tundra over much of the west and south parts and the gravels drape over the edges obscuring both bedrock and the true gravel thickness but it appears to be fairly thick. The flat occupies about the 2000' contour. On the east and north a thin tundra caps the gravel. This would appear to be an excellent airbase site, since drainage is good and the heaving problem is therefore likely not present.

The Upper-Lower Cretaceous, (Killik-Manushuk), contact is obscure, but limited exposures seem to place it along the E-W drainage south of Meat Mountain, or slightly to the north of the drainage."

"The Camp #2 anticline broadens out so much on the west side of the river that there must be a tear fault along the river. This probably relieved the northward compressive forces on the west while on the east the anticline became tightly folded to recumbent.



Section west side of Utukok River

Following this section westward it is seen to plunge gently toward the Kokolik Divide. It is a fair looking anticline with a small amount of probable closure. However, the sandstone series is thin and the shale sequence is thick so that it is probably economically insignificant."

"The exposures at the mouth of Adventure Creek tie in with the tightly folded anticline to the north of the ridge on which Camp #2 is situated. These exposures have black shales and sandstone beds that are highly crumpled and locally overturned. It is impractical to measure a section in such material."

"We are apparently camped on the north (South??) limb of a tight fold in the Lower Cretaceous rocks. These rocks differ from the Lower Cretaceous to the north (south??) in that they are predominately fine-grained sandstone, light greenish gray, better sorted, although not entirely clean. The sandstone does not look marine and since it is tightly folded and since it has nearly flat-lying beds on both sides of it at what appears to be a large angular unconformity, the best interpretation is Lower Cretaceous, (Killik). It is cut off on the east by a terrace."

Thompson, R. M., Field Notebook, Pg. 4

(Speaking of the Lower Cretaceous and Triassic sediments south of the anticline, between it and the mountain front). "The sediments are all dirty, poorly sorted, indicating rapid local sedimentation. The conglomerate and sandstone are not calcareous and probably have moderate porosity. Diastrophism has probably destroyed or hopelessly complicated any potential oil fields in such material."

Barksdale, W. L., Field Notebook, Pg. 6

(Extract, not quote). The Lisburne limestone at the front of the mountains is apparently overturned with the Noatak sandstone lying conformably on top. Only about 700 feet of the Lisburne is exposed.

Thompson, R. M., Field Notebook, Pg. 30

(Speaking of a series of bluffs along the Utukok River five to seven miles north of the axis of the Driftwood anticline). "These bluffs are cut in highly deformed Lower Cretaceous shale, fine-grained sandstone and siltstone beds. One cut will have vertical beds, the next horizontal, and so on. To measure a Lower Cretaceous section in such complex outcrops would require a field season and then the figures would be unreliable."

"Below is a sketch of a typical Lower Cretaceous exposure as shown in a big river cut between stations 26 and 28." (Approximately seven miles north of the axis of Driftwood anticline)



"Bed A is a massive concretionary siltstone, it has only about 20' of displacement. Thrusts 2&3 may be large, displacement not apparent."

The notes of both Thompson and Barksdale indicate a marked angular unconformity between the shale section surrounding this anticline and the overlying sandstone. This angular difference seems to be about thirty degrees just north of the Driftwood anticline and to diminish quite rapidly toward the coast.



644 LT. 4626-M-7M 137,4675-10 July 42. NPA-3. RESTRICTED  
LOOKING WEST



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LOOKING EAST

ELEVATION OF TERRACE GRAVEL  
R.M.T. 2000' +  
W.L.B. 2500'

