PRELIMINARY REPORT ON THE STRATIGRAPHY AND STRUCTURE OF THE AREA OF THE IPNAVIK RIVER, ALASKA

By

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INTRODUCTION

Geological Survey Party 1 returned to Umiat from Wolf Creek on August 5. Plans for the field season of 1947 called for geologic reconnaissance along part of the Ipnavik River and along the Colville River between the Ipnavik and Kurupa Rivers, to be completed before the end of the season. Since not much time remained and the traverse was long--about 70 airline miles--it was decided that the work would progress more rapidly if two parts of the traverse were worked at the same time. Accordingly, Robert F. Thurrell, Jr., and James H. Zumberge, geologists, were transported by plane from Umiat to the confluence of the Ipnavik and the Colville Rivers on August 8. From there they traversed down the Colville to the Kurupa River 1/.

The other two members of Party 1, Karl Stefansson, geologist, and Elder W. Lebert, cook, remained in Umiat until August 14 when a small plane was finally available to transport them to a camp on the Ipnavik River, about 30 airline miles southwest of the junction of the Ipnavik and the Colville Rivers. The party reached the Colville River on September 2, and arrived at Umiat on September 6.

STRATIGRAPHY

Rocks of probable Triassic, Lower Cretaceous, and Upper Cretaceous ages were found in the area of the Ipnavik River. The rocks believed to be Triassic in age are largely of igneous origin. They include basalts, diabase, and tuffs. Beds of chert and limestone are common, and some shale was also seen. The limestone and tuff are highly silicified. The Triassic fossil Monotis is common in the limestone beds. The whole series is complexly folded. The Lower Cretaceous rocks are highly argillaceous, siliceous, fine-grained, greenish sandstones, dark clay-shales, and siltstones. No fossils were found in this series.

The Upper Cretaceous rocks are a thick series (about 1,000 feet) of conglomerate beds, with interbeds of greenish, argillaceous sandstone. The top 60 feet of this section is entirely of this sandstone. The base of the section is not well exposed, and may contain some shale and sandstone. The conglomerate, which makes up the greater part of the section is largely a cobble conglomerate,

1/ Thurrell, Robert F., Jr., Preliminary report on the area of the Colville River from the Ipnavik to the Kurupa Rivers, Alaska, 1947.

with some pebble and boulder conglomerates present. The matrix appears to be the same type of sand as that found in the sandstone interbeds. The pebbles, cobbles, and boulders are mostly basic igneous rocks and are well-rounded to sub-rounded. Chert of various colors is common, and sandstone and clay pebbles are found. Their source appears to be proximal. That is, they were derived largely from the nearby Triassic rocks, and probably in part from the Lower Cretaceous rocks. No fossils were found in this series.

STRUCTURE

The sketch accompanying this report (Fig. 1) shows the approximate position of two anticlinal axes and two synclinal axes. For this report the contacts between the Triassic, the Lower Cretaceous, and the Upper Cretaceous have not been outlined. It is believed that integration of field data with data obtained from interpretation of aerial photographs will result in a fairly accurate delineation of the complicated structures in this area. Microfossil and heavy mineral studies, as well as studies of thin-sections of the igneous and sedimentary rocks will yield additional data. The results of these proposed studies will be presented in the final report on the area.

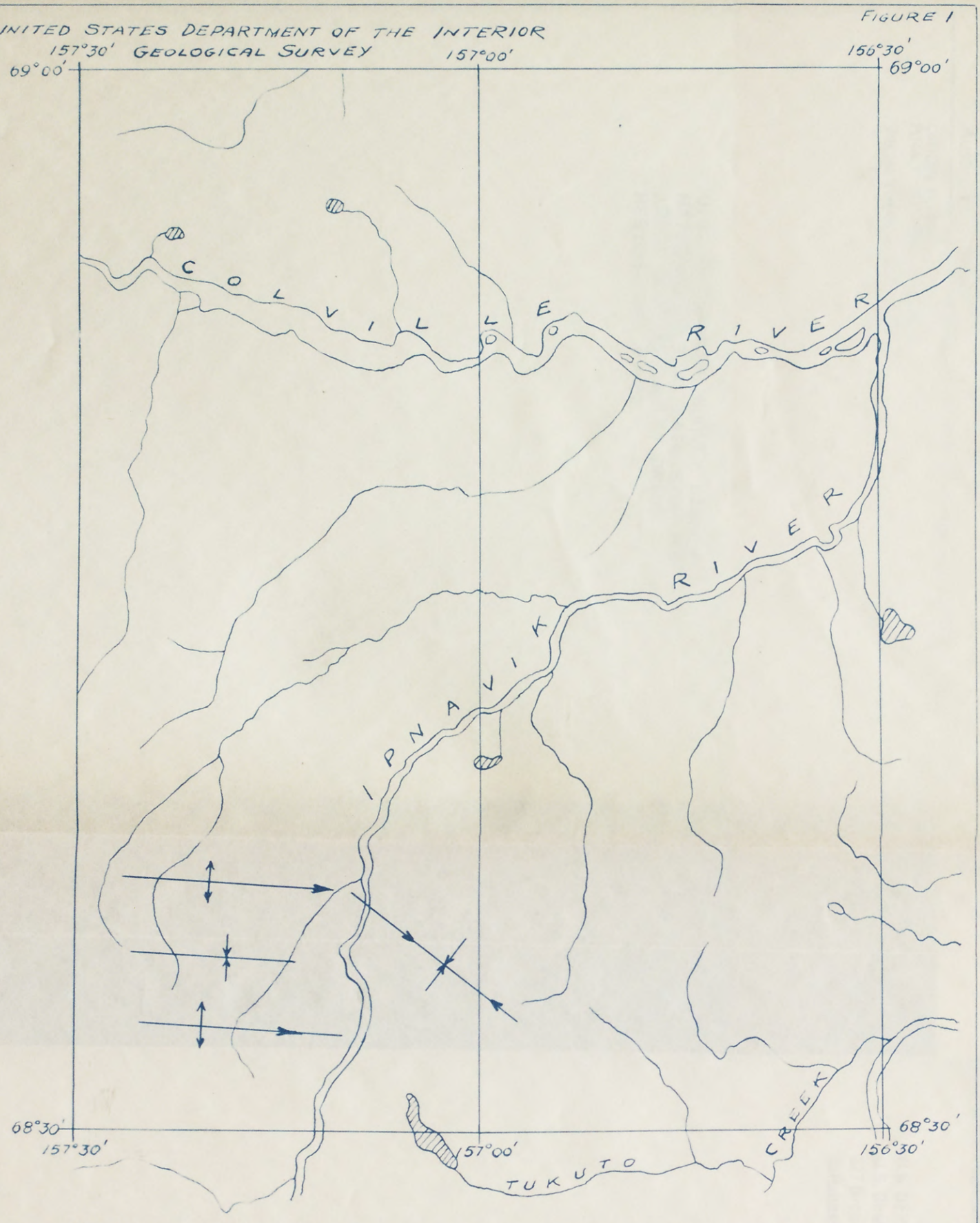
The two anticlinal axes shown on the map (Fig. 1) are axes of east-plunging anticlines. These anticlines are exposed in hills that rise to an elevation of over 1,000 feet above river level to the west of the Ipnavik River. The northern anticline is composed of Triassic basalts, diabases, and silicified limestone, interbedded with thin layers of black chert. Beds of chert and silicified tuff are common. Overlying this is a section of argillaceous, silicified sandstone which is believed to be Lower Cretaceous in age. Apparently the Lower Cretaceous rocks structurally conformable lie on the Triassic rocks. This section is not well exposed, and probably contains many interbeds of shale. The syncline between the two anticlines appears to be composed of these Lower Cretaceous rocks. The anticline south of the syncline is largely of Lower Cretaceous rocks. Triassic rocks are exposed in the core of this anticline. The trends of these three large structures is approximately N. 80°-85° W.

East of the river lies a synclinal mountain whose axis strikes about N. 50°W. The mountain is composed entirely of the conglomeratic series thought to be Upper Cretaceous in age. There is an angular unconformity between these Upper Cretaceous rocks and the underlying rocks. The structural trends of the Upper Cretaceous diverge sharply from those of the stratigraphically lower rocks. On the south side of the syncline Lower Cretaceous sandstone beds, striking approximately E-W and dipping about 30°South, can be traced to within a few hundred feet of the Upper Cretaceous conglomerates that here strike about N. 40° - 45°W. and dip 12°N.E. On the north side of the syncline several of the Triassic ridges were traced almost to the conglomerate beds. The trend of the Triassic ridges was, in all cases, at an angle to the trend of the conglomeratic beds of the syncline.

North of the structures discussed above, there lies a belt about 3-4 miles wide, in which numerous ridges of Triassic rock outcrop. These ridges trend approximately east-west, and appear to be strike ridges. The dips of the beds

are vertical or nearly vertical. These ridges may represent a series of isoclinal folds. North of this belt of Triassic rocks outcrops are limited to exposures along cutbanks of the river. These cutbanks expose a tightly folded series of black clay shale with interbeds of siltstone. Only rarely were sandstone beds seen. This section is exposed as far north as the Colville River. Numerous compass readings on these shale beds indicate a rather constant strike of N. 50°-60°W.

FIGURE 1



SKETCH MAP OF THE AREA OF THE IPNAVIK RIVER, ALASKA

Scale 1:250,000

Karl Stefansson, 1947