Will Work If Properly Designed—

Scientist Points Out Possible Pipeline Failings as Planned

What dangers are presented by placing a heated pipeline in permafrost as has been proposed by the Trans Atlantic Pipeline System?

Such was the question tackled by Arthur H. Lachenbruch in a recent issue of U.S. Geological Survey published by the Department of the Interior.

If the pipeline is properly designed, and if it is constructed and maintained in compliance with the design, problems will not occur, he contended.

But, he wrote, "it is important that any potential problem be identified prior to its occurrence so that it can be accommodated by a proper pipeline design."

Such an identification and a solution will require the perspectives of specialists from many disciplines, he added.

Stating that his report did not consider all the potential problems, Lachenbruch expressed hopes that it would provide "one reference point for objective discussion between the people of many backgrounds who must communicate effectively on this issue."

TAPS' plans call for a pipe four feet in diameter to be buried most of the way along an 800-mile route stretching from Prudhoe Bay in the north to Valdez in the south.

According to most estimates, the author stated, the initial heat in the oil plus frictional heating in the pipe are expected to maintain temperatures of from 158 to 176 degrees.

For this reason, many Alaskans are concerned about the potential danger to the environment as the high temperatures melt surrounding permafrost.

A four-foot pipeline buried six feet in permafrost heated to 176 degrees will thaw a cylindri-

(Continued on page 6)

Pipeline Plans . . .

(Continued from page 1)

cal region 20 to 30 feet in diameter in a few years in typical permafrost materials, Lachenbruch wrote.

In 20 years, thawing depths could increase to 40 or 50 feet in southern Alaska and to 35 or 40 feet in northern Alaska where the permafrost is colder.

Insulating the pipe, he said, would decrease the thawing by only 30 or 40 per cent and primarily would only increase oil temperatures rather than decrease thawing.

In extreme conditions, he explained, the thawed permafrost around the pipe might flow "like a viscous river" dumping millions of cubic feet of mud at the downhill end of the pipeline. Such conditions could jeopardize the landscape substantially.

In areas where flowing of the thawed permafrost would not tend to occur, such flowing could be set off by a seismic vibration. As noted by the author, the southern part of the pipeline route lies in an active seismic zone.

Where the sediments are saturated around the pipeline, a trench one or more feet deep and tens of feet wide will probably develop over the pipeline in a few years, he wrote.

Where the trench is discontinuous, it could become a stream channel, altering drainage patterns and creating erosion problems along the pipeline.

Furthermore, heat and moisture transferred above the pipe could have a significant effect on the formation of local ground fog.

And, heat conducted from the pipe to the surface will affect surface and plantroot temperatures possibly over a band 60 feet wide.

Directly over the pipe, snow will probably remain on the ground only after the heavier storms.

Such were some of the potential effects outlined in Lachenbruch's report. To ascertain their real danger and to develop a solution he called for additional study and an intensive program of field and laboratory measurements of conditions along the route.