27. "Structural Interpretation of the Loci of Petroliferous Portions of the Devonian Reefs in the Edmonton Area," by R. L. RUTHERFORD, Department of Geology, University of Alberta. Prologue—"Ex ore equi."

A discussion of the salient features of the structural position of these fields in respect to the mountain and foothills front on the west and the pre-Cambrian terrane on the east.

28. "Northwest Territories and Norman Wells," by F. A. MCKINNON, Royalite Oil Company Ltd., Calgary, Alberta.

The sedimentary basin area of the Northwest Territories of Canada, which lies between the pre-Cambrian Shield and Cordilleran Mountain area, covers approximately 256,000 square miles. Sediments ranging in age from Cambrian to Tertiary are present and of these only the Upper Devonian has produced oil in commercial quantities. Shows of oil have also been encountered in Cretaceous sediments.

The Norman Wells pool is a lenticular coral reef, lying within the black bituminous Fort Creek shales of Upper Devonian age. The pool is an example of a stratigraphic trap on the flank of a monocline dipping about 5° to 7° southwest. Near the crest of this coral reef, and very close to the up-dip side, the shallowest hole reached the top of this limestone reservoir at a depth of 1,040 feet, and on the down-dip edge the top of the reef limestone is reached at a depth as great as 1,893 feet.

29. "The Middle Devonian in the Pine Point Area, N.W.T.," by NEIL CAMPBELL, district geologist, Consolidated Mining and Smelting Company of Canada Ltd. Paper presented by the Geological Society of Canada.

Extensive drilling on the south shore of Great Slave Lake has yielded new information on the structure and lithology of the Pine Point, Presqu'ile and Slave Point formations of Middle Devonian age. In most places along a 5 mile-wide belt, traced 30 miles in a N. 70° E. direction from a point 11 miles south of the mouth of the Buffalo River, the Slave Point formation varies from an upper phase of thin-bedded fossiliferous limestones to a lower phase which is mainly sub-lithographic limestone. These beds overlie coarsely recrystallized, vuggy dolomite of the upper part of the Presqu'ile which rests upon a considerable thickness of fine, sugary-textured and compact crystalline dolomites. The Presqu'ile dolomites overlie the shaly limestones of the Pine Point formation.

North of this belt, the coarse-grained dolomite lenses out and, in the western part of the area, the stratigraphic interval is occupied by green shales. The lower dolomites interfinger toward the north with shaly limestones lithologically similar to the Pine Point formation. South of the belt, the coarse dolomite grades into finely crystalline dolomite.

Although the regional dip is westerly, the structure is complicated by local folding and initial dips. North of the belt, northerly dips up to 125 feet per mile are found. South of the belt, the beds commonly dip more gently south.

Sphalerite, galena, and marcasite occur in greatest abundance at three horizons within the Presqu'ile formation. Sulphur, gypsum, pitch-like bitumen and small traces of oil are found in increasing abundance toward the west in the Slave Point and Presqu'ile formation.

The Presqu'ile formation shows many of the characteristics of a biostromal deposit with off-shelf facies extending into the basin of Great Slave Lake. The structure and development of the Paleozoic rocks may be related initially to the structure and topography of the underlying pre-Cambrian rocks.

30. "Regional Cross Section through the Reef Fields of Central Alberta," by A. NAUSS, consulting geologist, Calgary, Alberta.

AFTERNOON

*Presiding*, EARL B. NOBLE and F. A. MCKINNON.

31. "The Athabaska Tar Sands," by W. L. FALCONER and Staff of Pacific Petroleums, Ltd., Calgary, Alberta.

The Athabaska tar sands are one of the world's really great oil reserves. As they lie up-dip from the recently discovered Devonian oil pools of the Alberta basin perhaps more attention should be given to a study of the possible significance of this occurrence. This paper describes the occurrence, areal extent, thickness, facies, paleontology, and correlation of the McMurray formation. The nature of the oil and some of its properties are presented. This information is designed to be a companion piece with T. A. Link's paper immediately following.

In addition, a short history of the development of the processes for winning the oil and a review of the research findings of the Dominion and Provincial Governments is presented.

32. "Source of the Oil of the 'Tar Sands' of the Athabaska River, Alberta," by T. A. LINK, consulting geologist, Toronto and Calgary.

The "Tar Sands" of the Athabaska River of Northern Alberta are believed to have derived their bituminous content from the underlying coral reef reservoirs of the Upper Devonian which come in contact, or near contact, with the sands at the unconformity between the Lower Cretaceous and the Upper Devonian. The sand was supplied from the pre-Cambrian Athabaska sandstone at the east on the Canadian Shield, and it is suggested that the escape of oil via fissures from the De-