

desired. After the very wet weather that hit the Calgary Exhibition and Stampede this year, the Stoney Indians were blamed, and we are assured that the committee furnished them with lemon extract to bribe them into seeing that the meeting had fair weather.

## PROGRAM WITH ABSTRACTS

TUESDAY, SEPTEMBER 5

## MORNING

*Presiding*, J. O. GALLOWAY and N. W. NICHOLS.

1. Welcome, by Honorable N. E. TANNER, Minister of Lands and Mines, Alberta.
2. Greetings from Alberta Geologists, by J. S. IRWIN, consulting geologist, Calgary, Alberta.
3. Response, by C. L. MOODY, president, American Association of Petroleum Geologists.
4. Response, by PETER PRICE, president, Geological Association of Canada.
5. "Historical Notes on Oil and Gas Developments in Western Canada," by GEORGE S. HUME, Director General of Scientific Services, Department of Mines and Technical Surveys, Ottawa.

In oil exploration there have always been periods of intensive activity or booms followed by periods of moderate and steady progress. In western Canada the first "boom" took place at Pincher Creek in 1891 in the area where now there is a great gas-distillate field at a depth of 12,000 feet, but where in the early days excitement arose from the discovery of oil seepages on Cameron Brook in Waterloo Park, in beds now known to be pre-Cambrian and lying above the great Lewis overthrust. Gas was discovered in Medicine Hat in 1901 and this was described by Kipling as that "town having all hell for a basement." From these beginnings progress was steady but slow, the main boom events being recorded by Turner Valley in 1913-14, 1924, and 1936 and the Leduc discovery in 1947 leading to present developments.

6. "Geology of the Banff Area," by P. S. WARREN, Department of Geology, University of Alberta.

This paper is for the purpose of introducing the Banff section to the members attending the meeting rather than introducing new data. The formations are listed and described and their age is deduced from fossil evidence. A section of a typical mountain range is shown.

7. Announcement about Field Excursion by D. B. LAYER, Imperial Oil Company, Ltd., Calgary, Alberta.

## AFTERNOON

8. Field Excursion of the Banff Area. Leader, D. B. LAYER. Description of Glaciation by J. A. ALLAN, formerly head of the Department of Geology, University of Alberta.

WEDNESDAY, SEPTEMBER 6

## MORNING

*Presiding*, J. B. WEBB and J. S. IRWIN.

9. "A Tectonic Map of Canada," by D. R. DERRY, chairman, Projects Committee, Geological Association of Canada.

The paper accompanies a preliminary print of the Tectonic Map of Canada, produced by the Projects Committee of the Geological Association of Canada with the financial support of the Geological Society of America. The aims, sources of material, method of compilation and interpretation are described and discussed. Some of the larger structural features on a continental scale are described and the evidence for their existence and significance is presented. The largest structural features that stand out on the map are:

- (1) The Foothills "front" extending from the U. S. boundary to west of the mouth of the Mackenzie.
  - (2) The Rocky Mountain Trench fault zone.
  - (3) The Grenville front or fault zone extending from Lake Huron to beyond Lake Mistassini and, after a break, on to the Labrador coast.
  - (4) A zone of thrust faults on the eastern margin of the Labrador "trough."
  - (5) The Champlain-St. Lawrence or Logan fault.
- The evidence for the existence and character of these structures is briefly discussed.
10. "Regional Structure of the Eastern Side of the Canadian Cordillera," by A. J. GOODMAN, Socony-Vacuum Exploration Company, Calgary, Alberta.

The eastern side of the Cordillera in western Canada is an integral part of the western Canadian oil province.

This paper is an interpretation of regional Cordilleran structure and its relation to the foreland or plains area, according to concepts already formulated by R. T. Chamberlin and others.

11. "Evolution of the Foothills Belt of the Rocky Mountains in Canada," by H. H. BEACH, chief geologist, Texaco Exploration Company, Calgary, Alberta.

This paper is concerned with the origin of the complex structures forming the narrow disturbed

belt extending some 1,100 miles along the eastern edge of the Rocky Mountain system in Canada. Consideration is given to the general structural pattern of the belt with emphasis on the major arcuate trends and on the variations in structural character from one region to another. Possible causes of the structural pattern are sought in the relationship of the margin of the pre-Cambrian shield to the Rocky Mountain geosyncline; in facies changes in the Paleozoic and Mesozoic sedimentary section and in the intrusions of Cretaceous and Tertiary batholithic bodies in eastern British Columbia.

12. "Folded Faults in the Rocky Mountain Foothills," by J. C. SCOTT, Husky Oil and Refining, Ltd., Calgary, Alberta.

The occurrence and habit of multiple-folded faults are shown and the relationship of folding to faulting is discussed for a part of the central Alberta foothills northwest of Nordegg. The relationship of these faults to the Brazeau structure and implications regarding other foothill folding are also discussed.

13. "Geology of the Turner Valley Oil and Gas Field," by W. B. GALLUP, geologist, Royalite Oil Company, Ltd., Calgary, Alberta.

The Turner Valley field is shown to be comprised of two Laramide structures, the Turner Valley and Millarville thrust sheets, the latter overriding the down-plunging north extension of the former. The ancestral fold and age of accumulation are pre-Jurassic and pre-Blairmore. The reservoir rock is a dolomitic biostrome so identified by the abundance of detrital crinoids etc. which form the porous zones and provide source. This relationship between the early accumulation and the age of folding together with the organic origin of the reservoir, is significant in prospecting for oil in the Paleozoics of the Foothills and Western Plains areas.

14. "The Devonian of the Rockies," by F. G. FOX, geologist, Hudson's Bay Oil and Gas Company, Ltd., Calgary, Alberta.

Out of twenty-four Devonian sections studied between the Bow and Athabaska rivers, and one section in the Crowsnest Pass, eleven have been selected to provide outcrop evidence of the nature of the western extension of the rocks which yield "reef" oil and gas in the Plains area.

15. "Charles Darwin and the Coral Reefs of Western Canada," by W. W. WARING, research geologist, Imperial Oil Ltd., Calgary, Alberta.

Statements and conclusions regarding coral reefs, by Charles Darwin, presented first in 1837, are incorporated in a definition and classification of "coral" reefs. Many of his observations are pertinent to the Devonian reefs of Western Canada. Cross sections illustrating bank and shoal reefs in the Edmonton area are presented. Lithologic specimens from Recent and Devonian reefs are compared.

#### AFTERNOON

*Presiding*, J. O. G. SANDERSON and H. H. BEACH.

16. "The Geological History of the Plains Area in Western Canada," by J. B. WEBB, chief geologist, Anglo-Canadian Oil Company, Ltd., Calgary, Alberta.

The geological history of the plains of western Canada is discussed in the broad terms of cycles of sedimentation and erosion and their relationship to periods of uplift and orogeny. Illustrations include several maps for the important periods of sedimentation showing present distribution of sediments and generalized isopachs, also structural cross sections and correlated stratigraphic sections.

17. "Upper Devonian Stratigraphy of the Alberta Plains Area," by I. M. COOK, consulting geologist, Calgary, Alberta.

Recent major oil discoveries found in Upper Devonian reefs in central Alberta have greatly increased Devonian stratigraphic information. Knowledge of Devonian rocks is derived solely from subsurface information with the exception of two areas—the easternmost ranges of the Rocky Mountains in southwestern Alberta where Devonian and Mississippian rocks form the backbone of the mountains, and a part of northeastern Alberta adjacent to the Canadian Shield where Devonian rocks are exposed in low, discontinuous outcrops along the principal rivers.

Discussion is limited to Upper Devonian rocks occurring between the Elk Point formation (Middle Devonian?) below and Mississippian beds above. Regional aspects of Upper Devonian formations recognized are discussed individually by thickness and lithofacies maps and by stratigraphic sections. Regional structural maps drawn on the base of the Devonian D<sub>3</sub> reef section, the top of the Devonian D<sub>2</sub> formation and on the top of the Devonian, together with a pre-Cretaceous paleogeologic map are discussed.

Stratigraphy is the controlling factor of oil accumulation in Upper Devonian rocks of the Alberta plains area, with structural accumulation virtually absent. Interpretation of subsurface data is becoming increasingly more important.

18. "Some Thoughts on 'Reef' Trends and Configuration," by T. A. LINK, consulting geologist, Calgary and Toronto. Paper presented by the Geological Association of Canada.

An attempt to visualize what some modern coral-reef alignments and configuration might