CHAPTER 5

UNDERGROUND REEFS IN CANADA

The existence of reefs deeply buried far inland from the oceans may come as a surprise to some. However, these are very common on the North American continent and in parts of Europe. They are one of the exciting time indicators which have come to light as a result of man's search for oil and minerals deep in the earth.

A Discovery in Alberta

Before the 1940's the Canadian oil industry was very small, due to lack of known oil reserves. Most of the vast central part of Canada has very few sedimentary deposits for producing oil, because the sediments were long ago eroded off, leaving exposed igneous and metamorphic rock. But the western part, expecially the province of Alberta, is underlain by several thousands of feet of various kinds of sedimentary rock. The knowledge of these deposits led Canadian oil prospectors to drill test wells in various parts of Alberta in hopes of finding oil-bearing sediments.

During the cold month of January in 1947, well drillers of the Imperial Oil Company of Canada were drilling a few miles southwest of Edmonton, the capital of Alberta, and had reached a depth of almost 5,000 feet. At this level the drill passed from the siltstone in which it had recently been, to a layer of dolostone. Soon the drill cuttings from this porous dolostone began to show small amounts of crude oil stain. The drilling crew immediately changed to a core-type drill with which they could remove the remaining footage of the well for careful study. (This would be of aid in understanding the underground strata of the area, so that more wells could be drilled, in case this one proved to be successful.) Within the next few feet a better concentration of oil was encountered in the dolostone, and by the time a depth of 5,049 feet had been reached, the coveted crude oil was flowing to the surface. Thus, what is known as the Leduc oil field came into the history of Canadian oil. More producing wells were soon drilled in that vicinity, and large amounts of oil were (and still are being) obtained from that field.

By studying the drilling records and cores from these wells, the petroleum geologists who were assigned to this oil field soon learned that the oil reservoir beneath them was a large mass of ancient, marine, carbonate rock layers (limestone and dolostone). This is one of the most common types of oil-retaining rock, and is the "hope and joy" of every petroleum geologist.[1] Approximately 50% of the obtainable oil reserves of Canada are in porous carbonate reservoirs. Because of the large number of fossils present in these carbonate layers, and because of the dissolving out of tiny pockets in the rock layers as they were long exposed to sea water--and sometimes to fresh water--a great many pores and small cavities were produced. These pores could then become the storage place for