

well encountered a dense layer of anhydrite, the most common evaporite associated with oil in that area, at a depth of about 5,600 feet.⁴

After passing through this evaporite deposit, the drill contacted oil in the thick body of porous dolostone which lay immediately beneath the evaporite layers. Since this well was being drilled for information as well as for oil, its depth was increased to see how many feet of oil-bearing rock lay beneath. At a depth of 5,866 feet the drill entered the top of an ancient reef.⁵ This reef, like most ancient reefs, was found to be a very good oil reservoir, because of its high degree of porosity. This was the first of many such reefs to be penetrated by wells drilled in the Rainbow area within the years which have followed. See Figure 12 for a map showing where some of these reefs are located, and Figure 13 for a vertical section of the Middle Devonian strata in which they are embedded.

During the first two and one-half years following the discovery of the first reef "oil pool" in the Rainbow area, 55 more reefs were found in the same area--most of them within a 15 mile radius of the original "discovery well."⁶ Most of these lie at a depth of between 5,000 and 6,000 feet below the surface. Many other similar reefs are now known in adjacent Middle Devonian oil fields in northwestern Alberta. Also, there is a whole series of these underground reefs, arranged along SW-NE lines, forming barrier reefs in the oil-bearing strata of that region, as shown in Figure 12.⁷

Reef Foundations

For understanding the significance of the oil-bearing reefs, note should be taken also of the fossil-bearing sedimentary layers which lie beneath them. We will here briefly describe some of these layers, then the make-up of the reefs themselves, and finally the strata which surround and cover them.

The lower layers of sedimentary rocks, which form the foundations on which the reefs of this region rest, consist of several kinds of marine sedimentary deposits. The thickness of this body of foundation sediments ranges from about 600 feet in some places to less than 100 feet in others.⁸ Some parts of this deposit contain an abundance of marine fossils.⁹ The arrangement and nature of these foundation sediments give unmistakable evidence that they represent a long period when a shallow sea covered the area. The entire 600 foot thick series consists of many alternating layers of shale, siltstone, anhydrite (calcium sulfate), limestone, and dolomite.¹⁰ All of these, except perhaps the siltstone, represent kinds of sediments which require a considerable period of time for the laying down of even a thin layer. In the lower two-thirds of the series, fossils are not abundant, giving further evidence that these layers were formed slowly in a sea that was so quiet that most of the fossil shells were either dissolved or broken into fine grains before being covered over. Thus we find this to be a significant part of the ever-present time record which God has left in the earth.