katchewan about 50 miles east of the Saskatchewan-Alberta boundary and 200 miles north of the International Boundary.

The presence of a productive and possibly persistent oil column along the southern part of the Dodsland field was not known until August, 1958, when three pools, known as Gleneath, Eagle Lake, and Braeburn, six miles apart were discovered. Previously the field was known only for its potential of gas reserves. Development of the oil pools is still in the early stages, and it is not yet known whether or not they will join. To date, thirty-five wells have been drilled with an unusually high ratio of successes to failures.

The field has the structure of an irregular dome on which there are several local highs. Gas has accumulated in the higher parts of the structure. Principal oil occurrences are on the southern flanks which are the center of present activity.

The productive zone of the field is a fine-grained, argillaceous, marine sandstone belonging to the Viking formation of Lower Cretaceous age. The sandstone becomes more and more argillaceous towards the northern and eastern parts of the Dodsland structure, and within the map-area grades into shale on the northern flank. The porosity of the sand averages about 23 per cent and the permeability about 15 millidarcys. Gross oil sand thicknesses encountered in wells drilled to date range from 24 to 39 feet.

Well completion procedure usually includes sand fracturing the Viking before placing the well on production. Completion costs are low due to the relatively shallow drilling depth of 2,250 feet.

Wells are drilled in all three pools on an approved 80-acre spacing pattern.

KENNETH F. CUMMINGS, Hondo Oil & Gas Company, Denver, Colorado

Buck Peak Oil Field—Moffat County, Colorado

The Buck Peak oil field in northwestern Colorado is located on the southeast end of the Sand Wash Basin. The field currently produces oil from the fractured Niobrara shale of Cretaceous age.

Fractured shale production has been known in northwestern Colorado since 1902 when Rangely was discovered. Since rotary tools were first introduced into northwestern Colorado in 1924, no new fractured shale fields were discovered until Buck Peak. Since that time many new fields such as Sage Creek, North Sage Creek, and South Tow Creek have been discovered and Rangely has experienced a new boom.

With such recent wildcat success in the Niobrara it can be assumed that the Niobrara has been overlooked for some time. Considering cumulative production in excess of 9 million barrels from the Niobrara in northwestern Colorado coupled with the recent discoveries, more individuals and companies will become interested in the Niobrara possibilities.

The method of finding fractured shale production at Buck Peak might be of some help to other individuals and companies who wish to explore for this highly elusive production.

DONALD E. DINKINS, Honolulu Oil Corporation, Billings, Montana

Geology of Stensvad Field, Montana, and Its Regional Geologic Setting, with Notes on Tyler Reservoir

The Stensvad field is a fault-stratigraphic trap situated in an east plunging syncline. An east-west fault limits the field to the south while stratigraphy controls the west and north limits.

Pre-Alaska Bench post-Heath nomenclature has been, and is, very complicated due to complex stratigraphy. Today, owing to the contributions of the many workers concerned with this interval, important formational units and unconformities are being recognized with subsequent resolution of the stratigraphic and nomenclatural problems.

The pre-Alaska Bench post-Heath stratigraphy in the Stensvad field area is most interesting, but can only be appreciated when considered in its regional setting. This sequence originated with uplift and erosion with ensuing alluvial fill of "channeled," or down-warped, areas, followed by marine transgression and regression.

Stensvad field is productive from three sandstone bodies occurring within the Tyler formation.

A. L. EVANS, Sun Oil Company, Calgary, Alberta

Red River Formation: Structural and Stratigraphic Interpretation

Ordovician strata in Manitoba comprise two vertically distinct parts, a lower clastic sequence, and an upper sequence of dolomites and dolomitic limestones. The latter have been divided into three formations having the character of para-time rock-units. These are recognizable in the outcrops of southern Manitoba and east-central Saskatchewan and can be traced into the subsurface. The lowermost, and by far the thickest, of the carbonate formations is the Red River.

The outline and shape of the depositional Williston Basin is reflected in the present structural attitude of the Red River, which also manifests the presence of a number of positive tectonic elements within the basin.

The formation thickens from the basin periphery toward the International Border, its center of maximum deposition being beyond the area of study, in central North Dakota. Both the rate of thickening and the degree of structural dip increase towards the basin center. Thinning of the formation is apparent over local positive areas.

The Red River is herein divided into Lower, Middle, and Upper units based on mass lithologic characters. The Lower and part of the Middle unit are restricted westward, indicating generally transgressive marine conditions during deposition. Minor cyclical fluctuations involving interbedded evaporites and bioclastic material are evident in the Upper Red River.

Three broad lithofacies may be discerned within the formation each of which is believed to reflect deposition within a relatively distinct environment, dependent primarily on the influence of water depth for its salient characteristics. These environmental zones blend into each other both laterally and vertically but within a single para-time unit tend to be related to structural features and to geographic position relative to the basin center. Their distribution implies the existence of a shelf-edge circumscribing the basin.

The development of porosity appears directly influenced by variations in lithology and by the degree of secondary dolomitization to which the rock has been subject.

The salinity of waters contained in the total Ordovician carbonate section is greatest nearest the basin center, fresh water predominating in closer proximity to the peripheral outcrops. Known occurrences of petroleum appear to bear a positive relationship to the distribution of highly saline formation waters.

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New Interpretation for Wolf Springs Field, Montana

The Wolf Springs field, 7 N.-32 E., Yellowstone