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Date: December, 1957

SERPENTINE OCCURRENCES IN EASTERN OREGON

Serpentine, peridotite and dunite are represented in eastern Oregon by a series of widely scattered exposures all of which occur in the area occupied by the Blue Mountain ranges. Figure ___ illustrates distribution excepting for two or three outlying exposures of very restricted extent. Occurrences shown in black represent exposures which have been defined by geologic mapping. Those indicated by the dotted boundary represent occurrences which are known to exist but which have not as yet been mapped in sufficient detail to permit depiction at this time in any more positive manner. The configuration of all mapped outcrops has been reproduced as accurately as practicable on a map of this scale but many of the smaller bodies are necessarily exaggerated in size.

The most intensive study yet made of the eastern Oregon serpentines, and their related ultrabasics, was made by Dr. T. P. Thayer of the United States Geological Survey during the course of several investigations of the chromite occurrences in the John Day area and the mapping of the John Day, Mount Vernon and Aldrich Mountain quadrangles. Thayer's findings are that the peridotites are intimately associated with gabbro with which they are essentially contemporaneous. Olivene-rich peridotite predominates although pyroxene-rich (50 percent or more) peridotite is also present together with pyroxenite along the border zones of the gabbro. Dunite is wide-spread in its occurrence, but individual bodies are usually small. The serpentine is derived from the peridotite and is usually highly sheared. Abundant water-worked serpentine debris

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in the lower strata of a sedimentary series of well-established upper-Triassic age shows that the serpentine and its related rocks are of pre-Upper Triassic age and probably Lower (?) and Middle (?) Triassic.

The serpentine-peridotite exposures occurring outside of the area mapped by Thayer are in all instances associated with Mesozoic gabbros and other Paleozoic-Mesozoic formations geologically similar to those in the John Day area. Accordingly, the probabilities are that Thayer's observations for the John Day-Aldrich Mt. serpentines can be applied to all the eastern Oregon serpentines in those areas where the other workers were unable to observe the criteria required for more than broad age determination.

Geologic references covering the area represented in figure ___ are listed below. Those marked with an asterisk show mapped serpentine bodies. The others show an absence of serpentine in their mapped areas. Data for the unmapped occurrences indicated by the dotted boundaries originate from this department's files of mineral resource investigation reports and general geologic reconnaissance studies.

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