

ABSTRACTS OF PAPERS DELIVERED BEFORE
THE GEOLOGY-GEOGRAPHY SECTION,
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CONTRIBUTIONS TO THE GEOLOGY OF NORTHWESTERN
STEVENS COUNTY, WASHINGTON

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Areal geologic mapping east of Columbia River in northern Stevens County indicates that the formations there may be correlated with certain of those in the Metaline quadrangle immediately to the east. Fossils were found in the Ledbetter slate and Metaline limestone, but most of the correlation had to be based upon similarity of lithologic sequences. The stratigraphic section follows:

FORMATION NAME	AGE	APPROXIMATE THICKNESS
Ledbetter slate	Ordovician (middle) Disconformity?	not determined
Metaline limestone	Cambrian (lower middle)	6100
Maitlen phyllite	Cambrian (lower?)	over 3700
Gypsy quartzite	Cambrian (lower?) Base faulted down	over 2500
Kaniksu granitic batholith	Cretaceous?	

Four swarms of andesitic dikes may be offshoots of the Kaniksu batholith.

The beds form steep-sided folds that trend northeast. Some folds are overturned to the northwest, and two reverse faults that dip southeast were seen. Of the many high-angle faults, ten appear to exceed 2000 feet in vertical displacement. Of the ten, all but one strike northeast, and at least two are vertical.

The folding and reverse faulting took place probably between the Carboniferous and Cretaceous periods, and the high-angle faulting during the Tertiary, or late Cretaceous.

GEOLOGY OF THE FOSTER CREEK DAM SITE

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The Foster Creek Dam Site, 50 miles downstream (west) from the Grand Coulee Dam, is designed to utilize 165 feet of head between Coulee and the Foster Creek Rapids in the Columbia River. The south bank and river bed at the site are excellent granite foundation for the dam, powerhouse, and all appurtenant works. The north bank is all glacial debris above the nearly level bedrock valley floor and nearly all pervious below pool level. Two methods of controlling seepage through the north bank are being considered. First, a concrete cutoff wall extending 2600 feet to intercept bedrock at pool level; and, second, an impervious blanket on the exposed surface of the previous material upstream from the dam coupled with a partial cutoff wall into the previous material.

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ENGINEERING GEOLOGY — A GROWING SCIENCE

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The growth of the science of engineering geology in the last two decades is remarkable. Contributing factors to its growth are the increase in the number of agencies using geologists, the increased scope of civil engineering, the fact that engineering projects are becoming more complex, and the development of mental and physical tools to translate geologic features from scientific language into more useful data. Civil engineering projects in the Northwest demonstrate the new applications of geologic knowledge. Academic studies of Northwest geology will be stimulated by the results of engineering geology investigations.

REACTION RIMS ON QUARTZ INCLUSIONS IN A DIABASE DIKE

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One of the numerous Tertiary diabase dikes of the Wallowa mountain region occurs along the southern extension of the Wallingford vein in the vicinity of Cornucopia, Oregon. It differs from the similar dikes in that it is filled with rock and quartz inclusions. Although the country rock in the vicinity of the outcrop consists entirely of granodiorite the dike contains inclusions of siliceous hornfels as well as granodiorite, quartz and feldspar grains derived from the granodiorite and vein quartz fragments. These fragments range in size from small grains a fraction of an inch in diameter to large angular pieces several inches to a foot in size.

The smaller quartz grains are surrounded by a brownish rim which under the microscope is seen to consist of pyroxene crystals for the most part augite. These crystals are commonly at right angles to the peripheral surface of the quartz grain, and some of them extend into the quartz and form slightly enlarged peg-like heads, and are separated by thin septa of quartz. Some of the quartz grains are also embayed by aggregates of zeolites which were formed presumably during the last stages of consolidation of the volatile-rich fraction of the magma. The reaction rims around the quartz inclusions in this dike appear to have resulted from an earlier magmatic metasomatic replacement which was followed by a later deuteric corrosion and replacement.

PRELIMINARY STUDY OF TEXTURES AND STRUCTURES IN THE GRANODIORITE AND ASSOCIATED SCHISTS AT FOSTER CREEK DAM SITE

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The rock at Foster Creek Dam Site consists of granodiorite in gradational contact with biotite-hornblende-quartz schist, and includes numerous large irregular tabular masses of schist and transitional schistose or gneissic facies.

The crystalloblastic character of the rock, the continuity of relic schistosity through granodiorite and transitional facies in gradational contact, and the similarity of small mineral crystals included in large porphyroblasts, usually in relic alignment or helicitic structure, support an hypothesis of metamorphic origin of the granodiorite by the metasomatic processes of granitization and feldspathization of biotite-hornblende schist.

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GEOLOGY AND GEOGRAPHY OF EUGENE AND ITS TERRITORY

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Eugene is the county seat of Lane county—one of the few counties in the United States which extends from the summit of a mountain range (over 10,000 feet high) to the ocean. It is in a unique position geographically as it lies near the junction of several tributary valleys of the Willamette River, giving it a very unusual strategic position with reference to the business of the Upper Willamette Valley. At the present time, Eugene is the virtual lumber capital of this country and just now is changing rapidly from an adolescent city to a mature one and is enjoying a mild boom. It is virtually near the transportation center of the state.

This paper discusses first the physical basis as a background for the activities of this city. This includes a general survey of Lane county especially, and the country even beyond the confines of this county. This is followed by a short survey of the history of the city from its founding by Eugene Skinner in 1857. The geological foundation is next discussed, and a chart presented which shows schematically the relation between the various activities of this region to the geological foundation. Next, the climate and physiography are discussed in detail and a special section is devoted to the Willamette Flood Project in which five of the seven flood control dams are to be located in the immediate vicinity of Eugene. The completion of this project will profoundly influence the economy of this region.

The second part of this study is devoted to a detailed discussion of the city itself, with the usual topics such as site, functional differentiations, street pattern, types of buildings, internal transportation, public utilities, health and sanitation, etc.

The third part will deal with economic resources of the region: the major industries, lumber, agriculture, and some reference to the mining industry, followed by education, recreation, etc.

The fourth part is devoted to a discussion of Eugene prospects for the future with suggestions for planning.

As Eugene is now embarking upon a study for a master plan, a study of this kind may be of some assistance, and may suggest how similar studies of other urban areas in Oregon may be carried out.

GEOLOGY OF THE AREA BETWEEN THE SNAKE AND SALMON RIVERS NORTH OF RIGGINS, IDAHO

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This report presents the preliminary results of the writer's field work for the Idaho Bureau of Mines and Geology during the months of June and July, 1944 and a few days during August of 1945.

The oldest rocks of the area are the green volcanics of the Seven Devils series. These are unconformably overlain by Upper Triassic limestones, phyllites and phyllitic schists. After deposition of the Triassic beds, the rocks of the area were uplifted, folded, faulted, intruded by granitic stocks, and then eroded to a mature surface. The Columbia River basalt of Miocene age then poured out on this mature erosion surface. Following the extrusion of the basaltic lavas the area was uplifted, warped and faulted. One large fault, called the Salmon River fault because it controls the direction of the Salmon River between the towns of Whitebird and Lucile, Idaho, offsets the flows of Columbia River basalt, making a tilted block of a part of the plateau surface.

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