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A PRELIMINARY, ANNOTATED BIBLIOGRAPHY OF THE GEOLOGY OF MOUNT HOOD

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A PRELIMINARY, ANNOTATED BIBLIOGRAPHY OF THE GEOLOGY OF MOUNT HOOD

Allen, John Eliot, Oregon's Volcanic History. Part 1. Ancient Volcanism: Geol. Soc. Oregon Country News Letter, v. 11, no. 17, p. 113-115, Nov. 1945
Part 2. Quaternary Volcanism: Geol. Soc. Oregon Coun. News Letter, v. 11, no. 18, p. 121-123, Dec. 1945.

A general Pre-Tertiary geologic history of Oregon with volcanic history to date. Classification of volcanoes by the way they act. Oregon volcanoes are Hawaiian-type shield volcanoes with occasional Strombolian eruptions of andesitic lavas.

Ayres, Fred D. and Cresswell, A. E., The Mount Hood Fumaroles: Mazama, v. 33, no. 13, p. 33-40, Dec. 1951.

Fumarolic gases were sampled in 1935 and again in 1951. The analyses (described) were essentially the same from both samplings.

Bailey, Jacob W., Mount Hood described, in Descriptions of Fossil Fresh-water Infusoria from Oregon: (U.S. Exploring Expedition to Rocky Mtns. and to Oregon and California, 18___ , p. 120, by J. C. Fremont.)

Ball, John, Remarks upon the Geology and Physical Features of the Country West of the Rocky Mountains: Amer. Jour. Sci., 2nd ser., v. 28, no. 1, p. 1-15, 1835.

Sighting of Mount Hood while traveling from Blue Mountains to Fort Walla Walla, 1835.

Barnes, Farrell F., The Structure and Stratigraphy of the Columbia Gorge and Cascade Mountains in the vicinity of Mount Hood: Univ. of Oregon master's thesis, 1930, unpub.

A vicinity report, i.e., Rhododendron-Lolo Pass.

Becker, C. F., The Geometrical Form of Volcanic Cones and the Elastic Limit of Lava: Amer. Jour. Sci., 3rd ser., v. 30, no. 178, p. 283-293, Oct. 1885.

Mathematical relationships of lavas and geometrical forms. Uses profile of Mount Hood volcano to illustrate point.

Bikerman, Michael, K-Ar Ages of Laurel Hill Pluton and Dike, Oregon: Ore Bin, v. 32, no. 11, p. 211-215, Nov. 1970.

Birch, Donald D., Ladd Creek Mudflow: Geol. Soc. Oregon Country News Letter, v. 29, no. 4, p. 27, 1963.

Caused by a landslide just below the front toe of Ladd Glacier. Water accumulated behind the debris. Mudflow swept down Ladd Creek for 4 miles.

Bogue, Richard G., A Petrographic Study of the Mount Hood and Columbia River Basalt Formations: Univ. of Oregon master's thesis, 1932, unpub.

General micro and mega description of rocks of Mount Hood. Texture, minerals, order of crystalization, magmatic history and classification; area lavas are mainly one type with minor variations. Highly viscous lavas did not flow far, probably caused by hypersthene. Trachyandesites. Lavas described as augite-andesite, andesine basalts, and hawaiites(?).

Bonney, Thomas G., Volcanoes, Their Structure and Signficance: G. Putnam's Sons, 1899.

A small note on Mount Hood in the relationship of volcanoes in a world-wide survey.

Bumstead, Newman, A Map Maker Looks at the United States: National Geographic, v. 99, no. 6, p. 705-748, June 1951.

Notes on Mount Hood.

Case, James B., High Cascade Glaciers Mapped, in Glacier Mapping in the Western United States: Ohio Univ., Research Foundation, Jan. 1960. [abs.] Geol. Soc. America Abs., v. 3, no. 10, p.11, Oct. 1961.

Christiansen, Robert L., Cenozoic Volcanism and Tectonism in the Western United States and Adjacent Parts of the Spreading Ocean Floor. Part 2: Late Cenozoic: Geol. Soc. America, Abstracts with Programs, v. 2, no. 2, p. 81-82, 1970.

Late Cenozoic change from calc-alkaline andesitic stratovolcanoes with ash flows to more basaltic. Basin and Range tectonism.

Church, Stanley E., Lead and Strontium Isotopes and Their Genesis of Andesitic Magmas in the Cascades [abs.]: Amer. Geophys. Union Trans., v. 51, no. 4, p. 442, 1970.

Indicates that crustal materials play a negligible role in origin of Cascade andesitic magma. Andesites formed from differentiation and from the upper mantle.

Condon, Thomas, On Some Points Connected with the Igneous Eruptions Along the Cascade Mountains of Oregon: Amer. Jour. Sci., 3rd ser., v. 18, no. 107, p. 406-408, Nov. 1879.

A letter written to J. P. Dana on continuity of lavas of Mounts Hood, Adams, and St. Helens. Good area observations.

Courtney, W. F., Eruption of Mount Hood: Steel Points, v. 1, no. 3, p. 135, April 1907.

Eruptions took place during latter part of September 1859. Mountain erupted at irregular intervals over 2-hour period.

Crane, H. R., and Griffin, J. B., University of Michigan Radiocarbon Dates V: Amer. Jour. Sci. Radiocarbon Suppl., v. 2, p. 31-48, 1960.
Collected and submitted by D. B. Lawrence, Univ. Minn. Hemlock (Tsuga) wood could date bursting out of south crater wall of Mount Hood, which released a great deal of water, possibly from a crater lake (sample taken from mudflow). Other samples date 17th century glacial advance.

Delano, Leonard H., Aerial Photographic Geomorphologic Features of Mount Hood, in The High Cascades: Geol. Soc. Oregon Country News Letter, v. 30, no. 5, p. 31-32, May 1964.

Dodge, Nicholas A., Recent Measurements on the Eliot Glacier: Mazama, v. 46, no. 13, p. 47-49, Dec. 1964.

Dorn, T. F., et al., Radiocarbon Dating at the University of Washington I: Radiocarbon, v. 4, p. 1-12, 1962.

Sample is a log from Stadter buried forest; 1670 ± 200. Could represent mudflow or glacial advance. Site needs revisiting.

Dott, R. H., Jr., Circum-Pacific Late Cenozoic Structural Rejuvenation: Implications for Sea Floor Spreading: Science, v. 166, no. 3907, p. 874-876, Nov. 14, 1969.

Uses Cenozoic structure and stratigraphy to reveal discordance between quiesent older period and newer period marked by volcanism, orogeny, faulting, rifting. Modern volcanic arcs and associated trenches may date from only mid-Cenozoic.

Eggler, David H., Water-saturated and Undersaturated Melting Relations in Two Natural Andesites [abs.]: Geol. Soc. America, Abstracts with Programs, v. 2, no. 7, p. 544, 1970.

Phase relationships of plagioclase and orthopyroxine megaphenocrysts compared in the andesite from Mount Hood and paricutin volcanoes. Magnetite and hornblende also discussed as minor role in andesite differentiation.

Emmons, Samuel F., Volcanoes of the Pacific Coast of the United States: Amer. Geograph. Soc. Trans. for 1877, pt. 1, p. 48-53.

Federal Writers Project , Mount Hood: American Guide Series, Works Progress Administration, 132 p., illus., 1940.

Folsom, Michael M., Volcanic Eruptions; the Pioneer's Attitudes on the Pacific Coast from 1800 to 1875: Ore Bin, v. 32, no. 4, p. 61-71, April 1970.

Mount Hood poorly documented. Fumarole active. Aug. 17, 1859 small comment in Weekly Oregonian. In 1865 night guard at Fort Vancouver reported seeing Mount Hood enveloped in smoke and flame and rumbling "not unlike distant thunder."

Grant, Roland D., Mount Hood: Mazama, a Record of Mountaineering, v. 1, no. 4, p. 24-27, 1896.

An address delivered at the summit, July 19, 1894. Description of topography in a few words.

Griffin, William C., Water Resources of the Portland, Oregon Area: U.S. Geol. Survey Circ. 372, 45 p., 1956.

On Bull Run surface water.

Hague, Arnold, Glaciers of Mount Hood: Steel Points, v. 1, no. 3, p. 114-116, April 1907.

_____, Mount Hood: Amer. Jour. Sci., ser. 3, v. 1, p. 165,167, 1871.

Geologic and lithologic descriptions gathered in preparation for a topographic map. Good geomorphologic descriptions of glacial valleys, debris fans, and the remaining crater and plug.

Hammond, Paul, If Mount Hood Erupts: Ore Bin, v. 35, no. 6, p. 93-102, June 1973.

A fictional description of volcanic events on Mount Hood in a chronological sequence. Seismic activity, ash fall, melt-water runoff, and devastating mudflow are emergencies which the residents, travelers, business people, and government agencies must deal with in the described emergency.

Handewith, Howard J., Our Living Alpine Glaciers: Geol. Soc. Oregon Country News Letter, v. 23, no. 4, p. 25-31, April 1957.

A good review of glacial morphology and mechanics. Pressure wave theory for advance and retreat of glaciers. Concept of Ice Ages remaining constant and ice at its maximum while the orientation of the poles on a rotating earth change. Ice remains in essentially the same place on the globe and the continents pass beneath it.

_____, Recent Glacier Variations on Mount Hood [Oregon]: Mazama, v. 41, no. 13, p. 23-28, 8 figs. Dec. 1959.

Mazama Research Committee aerial photo report on glaciers of the Oregon and Washington peaks especially for the International Geophysical Year, 1956. Mount Hood glaciers retreating for past 35 years (1957).

Hanson, Henry P., Chronology of Postglacial Volcanic Activity in Oregon and Washington [abs.]: Geol. Soc. America Bull., v. 58, no. 12, p. 1252, Dec. 1947. [also] Geol. Soc. Oregon Country News Letter, v. 13, no. 7, p. 63, July 1947.

Chronology of volcanic glass and pumice in peat bogs. Determined from pollen profiles and stratigraphic position.

Hodge, E. T., Geology of lower Columbia River: Geol. Soc. America Bull., v. 49, no. 6, p. 831-930, June 1938.

_____, Mount Hood, Geol. Soc. Oregon Country News Letter, v. 1, no. 13, p. 3-4, Sept. 1935.

There have been two Mount Hoods, old older, one now existing. The old Mount Hood was larger, composed of andesite and eroded away by glaciers. The present Mount Hood is smaller and has been eroded primarily by stream action.

_____, Stadter buried forest: Mazama, a Record of Mountaineering, v. 13, no. 12, p. 82-86, 1 fig., Dec. 31, 1931.

Buried forest on south side of spur between Reid and Zigzag glaciers.

Holden, Edward Singleton, A Catalogue of Earthquakes on the Pacific Coast, 1769-1897: Smithsonian Inst. of Wash., Misc. Collect. no. 1087, p. 24-27, 31-253, 1898.

Chart of reported eruptions of Mount Hood. 1831, 1846, 1854, 1859, 1865, 1869, 1906, and 1907.

Hopson, C. A., et al, Association of Andesitic Volcanoes in the Cascade Mountains with Late Epizonal Plutons [abs.]: Geol. Soc. America, Spec. Paper 87, Abstracts for 1965, p. 80, 1966.

Suggests an andesitic-dacitic magma for northern Cascades. Volcanoes came from late Tertiary plutons, which remained active at depth.

Howell, Paul W., Sandy River Buried Forest Trip: Geol. Soc. Oregon Country News Letter, v. 15, no. 7, p. 58, July 1949.

Ito, H., and Fuller, M., A Paleomagnetic Study of the Reversal Process of the Geomagnetic Field, in Paleogeophysics: New York, Academic Press, p. 133-137, 1970.

Ito, H., Fuller, M., Schmidt, V., and others, Paleomagnetic Studies of Field Reversals [abs.]: Amer. Geophys. Union Trans., v. 50, no. 4, p. 129, 1969.

A sequence of local orientations taken on Laurel Hill pluton show a progression from clearly reversed to normal.

Jillson, Howard R., Volcanic Activity of Mount St. Helens and Mount Hood in Historical Times: Geograph. Review, v. 3, no. 6, p. 481-485, June 1917.

Kuno, Hisashi, Report - Symposium on the Origin of Andesite Magma, Eugene, Oregon, July 1-5, 1968: Int'l Council of Sci. Unions Upper Mantle Comm., pt. 6, p. 58, May 1969.

Laursen, J. M., and Hammond, Paul, Radiometric Ages of Oregon and Washington through June 1972: Isochron/West, no. 9, April 1974.

Dates Andesites from seven areas on or adjacent to Mount Hood (7 ± 2 through 3.0 ± 0.2 m.y.) and Laurel Hill intrusion (11.6 ± 1.2 m.y.).

Lawrence, D. B., Glaciers and Vegetation of Southeastern Alaska: Amer. Scientist, v. 46, no. 2, p. 89-122, June 1958.

_____, Mount Hood's Latest Eruption and Glacier Advances: Mazama, v. 30, no. 13, p. 22-29, Dec. 1948.

_____, The Technique of Dating Prehistoric Glacial Fluctuations from Tree Data: Mazama, v. 28, no. 13, p. 57-59, Dec. 1946. review: Geol. Soc. Oregon Country News Letter, v. 13, no. 2, p. 14, Feb. 1947.

Lawrence, D. B., and Lawrence, Elizabeth G., Radiocarbon Dating of Some Events on Mount Hood (Oregon), and Mount St. Helens (Washington): Mazama, v. 41, no. 13, p. 13-18, Dec. 1959.

Lowell, W. R., The History of Geology in Oregon as Revealed by a Statistical Analysis of the Literature: Northwest Sci., v. 17, no. 2, p. 26-34, May 1943.

Lyman, W. D., Among the Volcanoes and Glaciers of Mount Hood: West Shore, v. 12, p. 282-284, 1886.

Geologic history of Mount Hood proper, glaciation and recent eruptions. Plate tectonics concepts, travelogue style, illustrated in the prestigious West Shore style.

Marshall, Earl A., Measuring Rate of Glacial Flow on Mount Hood in Oregon: Engin. News-Record, p. 326-328, Aug. 1930.

A 5-year study of Eliot Glacier by the Mazamas. Average upper line of stakes moved 161 ft/year; middle line 74 ft/year; lower line 10 ft/year.

_____, Report of Research Committee: Mazama, a Record of Mountaineering, v. 7, no. 2, p. 67-72, Dec. 1925; v. 8, no. 12, p. 65-68, Dec. 1926.

Eliot, Coe, Ladd glaciers studied.

Mason, Ralph S., Eliot Glacier Field Trip, in Onward and Upward: Geol. Soc. Oregon Country News Letter, v. 33, no. 9, p. 69-73, 1967.

_____, It's on Ice: Geol. Soc. Oregon Country News Letter, v. 12, no. 11, p. 103, Nov. 1946.

A trip around Mount Hood marking terminus of glaciers and checking recession, using previously established markings.

_____, Mount Hood's Vanishing Glaciers: Ore Bin, v. 8, no. 9, p. 61, Sept. 1946.

Research methods discussed. Glaciers have been receding for the past 3 years (1946). Center of Eliot Glacier sank 50 feet.

_____, Recent Survey of Coe and Eliot Glaciers: Mazama, v. 36, no. 13, p. 37-39, Dec. 1954.

Matthes, Francois E., The Glaciers of Our Time: Mazama, v. 21, no. 12, p. 20-26, Dec. 1939.

_____, How Old Are Our Glaciers?: Nat'l Park Serv. Bull., June 1939. [reprint] Geol. Soc. Oregon Country News Letter, v. 5, no. 13, p. 119-120, July 1939.

4,000 years old based on salinity of Owens Lake, east of Sierra Nevadas.

_____, On Glaciers: Amer. Geophys. Union Trans., 14th Ann. Mtg., 1933, sec. on Hydrology, p. 345-350, tables, June 1933.

Annual report on glacial movement; data from Mazama Research Committee on Eliot, Coe, Ladd glaciers 1925-1932.

_____, On Glaciers: Amer. Geophys. Union Trans., 16th Ann. Mtg., 1933, sec. on Hydrology, p. 388-392, June 1935; 13th Ann. Mtg., sec. on Hydrology, p. 282-287, Apr. 28, 1932.

Data from study by Mazamas of Eliot, Coe, Ladd glaciers; show less loss than Mount Rainier glaciers; tangled mass of logs protruding from under moraine of Zigzag glacier, evidently forest overridden by glacier. Similar situation on White River Canyon in 1906.

Matthes, Francois E., and Phillips, K. N., Surface Ablation and Movement of the Ice on Eliot Glacier (Mount Hood, Oregon): Mazama, v. 25, no. 12, p. 17-23, Dec. 1943.

Mazama Research Committee, An Aerial Photographic Survey of the Glaciers of Mount Hood, Mount Jefferson, and Three Sisters, Oregon: Mazama, Portland, 48 p., 1938.

McBirney, Alexander R., Petrochemistry of the Cascade Andesite Volcanoes, in Andesite Conference Guidebook: Oregon Dept. Geol. and Mineral Indus. Bull. 62, p. 101-107, 1968.

Almost no variation in the lava flows of Mount Hood from first to last, andesite, andesite-basalt.

Nelson, L. A., A New Glacier on Mount Hood: Mazama, A Record of Mountaineering, v. 7, no. 1, p. 67-68, Dec. 1924.

A new glacier lying below Triangle Moraine between White River and Zigzag glaciers. Source of the Salmon River was discovered because of snow disappearance, then recorded on maps.

The ORE BIN, How High is Mount Hood?: Ore Bin, v. 30, no. 4, p. 80, 1968.

A 5-line item noting a 10-foot discrepancy on U.S.G.S. topographic maps. Height of 11,235 feet determined in 1958.

The Oregonian, Mount Hood in Eruption: The Oregonian, Sept. 26, 1865. [also] Steel Points, v. 1, no. 1, p. 23, Oct. 1906.

Active puffs of dense black smoke from Mount Hood were witnessed by hundreds of people in Portland. "The fumes appeared to rise from deep gorge in the southwest side and were so thick as to obscure the view of the summit at times."

Pauly, Karl A., The Cause of the Great Ice Ages: Scientific Monthly, v. 75, no. 2, p. 89-98, Aug. 1952.

Phillips, K. N., Fumaroles on Mount Hood: Mazama, a Record of Mountaineering, v. 17, no. 12, p. 19-21, Dec. 1935.

The fumaroles are found chiefly on old volcanic plug. Gaseous content: H_2O vapor in large quantities, carbon dioxide, hydrogen sulfide. Evidence points to slow cooling of pits.

_____, Recent Changes in Hood's Glaciers: Mazama, a Record of Mountaineering, v. 17, no. 12, p. 44-50, Dec. 1935.

Most glaciers are retreating.

Rader, L. F., Swadley, W. C., Huffman, Claude, Jr., and Lipp, H. H., New Chemical Determinations of Zinc in Basalts and Rock of Similar Composition: Geochim. Cosmochim. Acta, v. 27, no. 6, p. 695-714, June 1963.

New zinc determinations for basalts from Idaho, Oregon, California, New Mexico, Connecticut and Hawaii. Avg. 0.0099% zinc. Uses chemical methods described by Huffman, et al., 1963.

Reid, Harry Fielding, Studies of Glaciers of Mount Hood and Mount Adams: Zeitschrift fur Gletscherkunde, Berlin, Band I, Heft. 2, p. 113-132, 1906.

Mount Hood composed of ejecta material, formed since glacial epoch. Erosion due to stream rather than ice action.

Richards, Carl P., Glaciers Studied from an Airplane: Mazama, v. 18, no. 12, p. 47-56, Dec. 1936.

Schmidt, R. G., and Shaw, H. R., Atlas of volcanic phenomena: U.S. Geol. Survey, 20 sheets, 1971.

Photos, schematic diagrams, and graphs in color, plus text, of world volcanism. Mount Hood shown.

Sheets, M. Meredith, Contributions to the Geology of the Cascade Mountains in the Vicinity of Mount Hood: Univ. of Oregon master's thesis, 71 p., map, 1932, unpub.

Steel, William G., Mount Hood: Steel Points, v. 1, no. 3, p. 89-99, April 1907.

Eruption 1846-1865. Failures/successes of various parties to reach the summit. First successful ascent on July 11, 1857.

Sylvester, A. H., Evidence of Recent Volcanic Activity and the Glaciers of Mount Hood, Oregon [abs.]: Science, v. 27, p. 585, April 1908.

Evidence of some activity in 1907 about Crater Rock. White River increase of flow.

Waters, Aaron C., Volcanic Rocks and the Tectonic Cycle, in Crust of the Earth, Symposium: Geol. Soc. America Spec. Paper 62, p. 703-722, 1955.

The Cascade Mountains are "first cycle" volcanics composed of about 75 percent andesites. Gives geochemical comparisons between lavas of different cycles and localities. Offers the hypothesis that differentiation of a basic magma does not occur, but rather tholeiitic magma rises in a massive earth shell and differentiation occurs only after eruption to high levels.

Weekly Oregonian, Eruptions of Mount Hood [editorial]: Weekly Oregonian, Aug. 20, 1859. [also] Steel Points, v. 1, no. 3, p. 136, April 1907.

In August 1859 the atmosphere became exceedingly heavy. Dark, silvery, condensed clouds hung over top of Mount Hood (Wed.). On Thursday, fire was visible. Later examination of Mount Hood showed "that a large mass of the northwest side had disappeared and that an immense quantity of snow which two weeks since covered the south side had also disappeared."

Wise, William S., Final Eruptive Phase of the Mount Hood Volcano, Oregon [abs.]: Geol. Soc. America, Spec. Paper 101, Abstracts for 1966, p. 347, 1968.

_____, The Geologic History of Mount Hood, Oregon: Mazama, v. 46, no. 13, p. 12-22, Dec. 1964.

_____, Geology of the Mount Hood Volcano, in Andesite Conference Guidebook: Oregon Dept. Geol. and Mineral Indus. Bull. 62, p. 81-98, 1968.

Wise, William S., Geology and Petrology of the Mount Hood Area: A Study of High Cascade Volcanism: Geol. Soc. America Bull., v. 80, no. 6, p. 969-1006, June 1969.

Mount Hood volcano is composed of olivine-pyroxine and hornblende-dacite lavas and pyroclastic debris. The main cone growth phase ceased before the Fraser Glaciation, but a plug-dome of hornblende andesite was extruded through the southern slope about 2,000 years ago.

The andesite of Mount Hood is not associated with high-alumina basalts. This suggests that Mount Hood lava did not differentiate from a high alumina basalt magma but rather from a series of separate magmas which were generated through time by supracrustal anataxis.

_____, A Guide to the Volcanic Rocks of the Cascade Range: Mazama, v. 46, no. 13, p. 23-25, Dec. 1964.

Williams, Howel, The Ancient Volcanoes of Oregon: Ore. System of Higher Educ., Condon Lecture ser. 1, 1948.

A portrait in non-technical terms of the volcanic history of Oregon during the last 60 million years.

Williams, John H., Guardians of the Columbia: Tacoma, 1912 [probably privately printed]

Popular and well-illustrated accounts of Mounts Hood, St. Helens, and Adams.

Williamson, Lieut. R. S., Ascent of Mount Hood in Oregon and Determination of its Height: Amer. Jour. Sci., 2nd ser., v. 44, no. 132, p. 429-431, Nov. 1867.

Discussion of barometric observations at Astoria, Fort Vancouver, The Dalles, and the summit of Mount Hood. Elevation 11,225 feet. Other observers "boiled their thermometers" to get 17,000+ foot elevation.