

STATE OF OREGON  
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
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Portland, Oregon 97201

**BULLETIN 102**

**BIBLIOGRAPHY**

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**OF OREGON**

**Seventh Supplement**

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## BIBLIOGRAPHY OF THE GEOLOGY AND MINERAL RESOURCES OF OREGON

### SEVENTH SUPPLEMENT, 1976-1979

#### INTRODUCTION

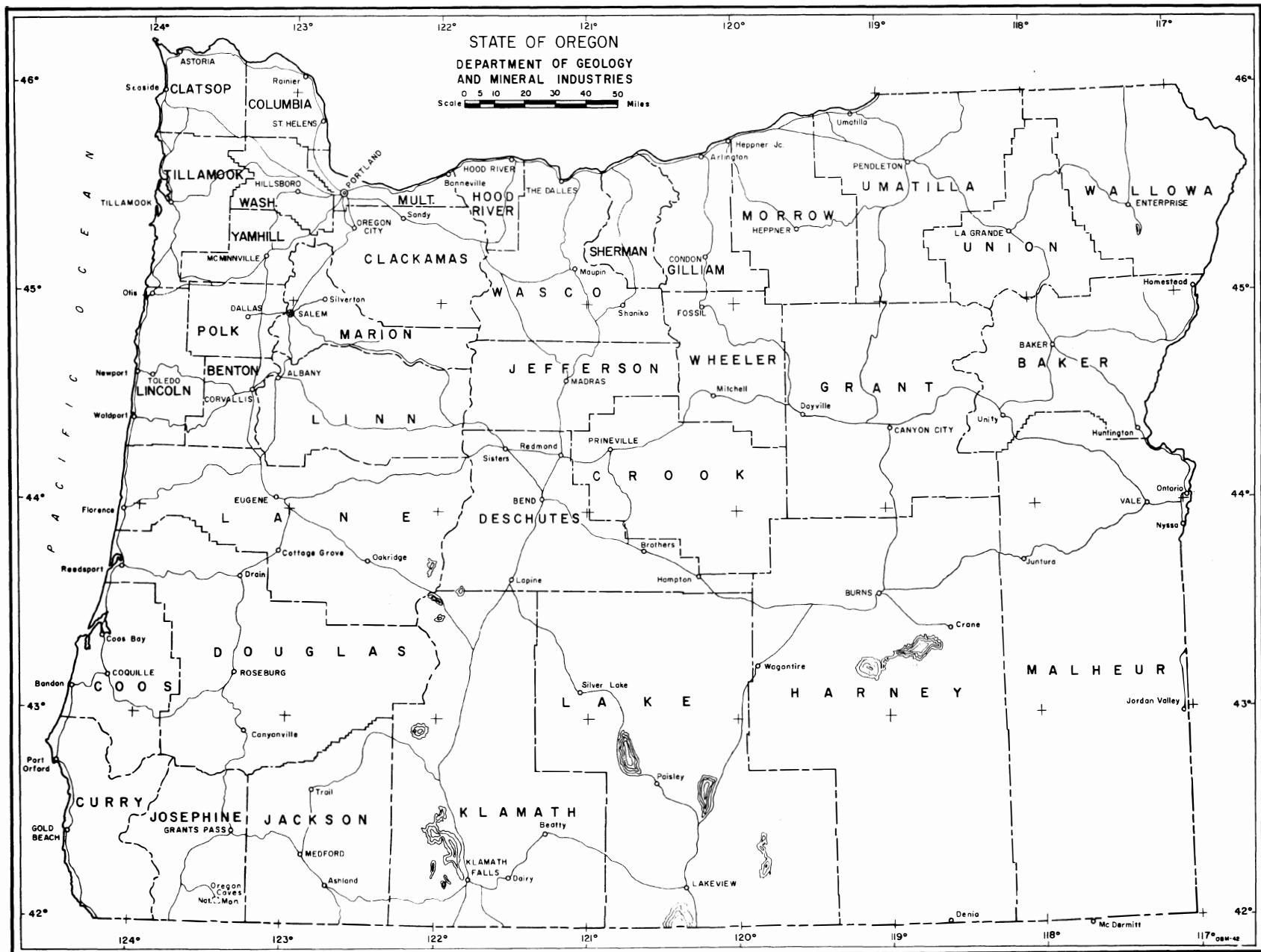
The original *Bibliography of the Geology and Mineral Resources of Oregon* was compiled by R. C. Treasher and E. T. Hodge and published in 1936 by the Oregon State Planning Board. Since then, the Oregon Department of Geology and Mineral Industries has been updating this compilation periodically in its *Bulletin* series. The present Bulletin 102 is the seventh of such supplements. The previous supplements, their compilers, and the periods covered are listed below:

- Supplement 1 (J. E. Allen, 1947), 1936-1945: Bulletin 33.
- Supplement 2 (M. L. Steere, 1953), 1946-1950: Bulletin 44.
- Supplement 3 (M. L. Steere and L. F. Owen, 1962), 1951-1955: Bulletin 53.
- Supplement 4 (M. Roberts, 1970), 1956-1960: Bulletin 67.
- Supplement 5 (M. Roberts, M. L. Steere, and C. S. Brookhyser, 1973), 1961-1970: Bulletin 78.
- Supplement 6 (GeoRef and Oregon Department of Geology and Mineral Industries, 1978), 1971-1975: Bulletin 97.

As in the case of the 6th supplement (Bulletin 97), GeoRef Information System of the American Geological Institute, John G. Mulvihill, Director, has compiled the bibliography and edited and supplemented it in cooperation with the Oregon Department of Geology and Mineral Industries.

In format, then, Bulletin 102 is quite similar to Bulletin 97: The bibliography proper is accessible through subject, county, and rock-unit indexes. In addition, a serials list explains abbreviations for serials mentioned in the bibliography. The map showing Oregon's counties is included for assistance in using the county index or such subject terms as "Areal geology."

Although every possible effort has been made to present a complete bibliography, the compilers are painfully aware of shortcomings and uncertainties in the listing. Users of the bibliography are urged to notify the Oregon Department of Geology and Mineral Industries of any omissions or errors that come to their attention.



## OREGON COUNTIES

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— Triassic blueschist from northern California and north-central Oregon (Hotz, P. E. 1977)

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**Applications:** Dating methods of Pleistocene deposits and their problems; V, Teprochronology and fission-track dating (Westgate, J. A. 1980)

**Geochronology—Hydration of glass**  
**Pumice:** Hydration dating of volcanism at Newberry Crater, Oregon (Friedman, I. 1977)

#### Geochronology—Paleomagnetism

**Basalt:** Paleomagnetism of basalt flows, North central Deschutes-Umatilla Plateau, Oregon (Farooqui, S. M. 1976)

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**Archaeology:** Role of thermal history uncertainties in amino-acid racemization age estimation of geological and archeological samples (Wehmiller, J. F. 1979)

**Correlation:** Late Pleistocene and Holocene zoogeography, Pacific Northwest coast (Kennedy, G. L. 1979)

**Shells:** Amino-acid racemization dating of Quaternary mollusks, Pacific Coast United States (Wehmiller, J. F. 1978)

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**Tephrochronology**  
**Applications:** Dating methods of Pleistocene deposits and their problems; V, Teprochronology and fission-track dating (Westgate, J. A. 1980)

#### Geodesy—Surveys

**Western U.S.:** Strain accumulation rates in the western United States between 1970 and 1978 (Prentiss, W. H. 1979)

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**Geomorphology** see also Glacial geology

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**Mass movements:** Mass erosion processes in forested western Oregon watersheds (Swanson, F. J. 1976)

**Processes:** Seasonal variation in beach erosion and sedimentation on the Oregon coast (Fox, W. T. 1978)

#### Geomorphology—Applications

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#### Geomorphology—Eolian features

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#### Geomorphology—Fluvial features

**Channels:** A channel stability inventory for two streams on the eastern slopes of the Coast Range, Oregon (Sachet, J. A. 1978)

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**Craters:** Diamond Craters; Oregon's geologic gem (Smurthwaite, D. 1979)

#### Geomorphology—Lacustrine features

**Lakes:** Beyond the seventh dune (Baugh, T. 1978)

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#### Geomorphology—Landform description

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**Sedimentation:** Weather patterns and coastal processes (Fox, W. T. 1976)

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**Beaches:** Beach erosion on Siletz Spit, Oregon (Komar, P. D. 1976)

— Beach profile changes and on-shore-offshore sand transport on the Oregon coast (Aguilar-Tunon, N. A. 1977)

— Beach profiles on the Oregon and Washington coasts obtained with an amphibious DUKW (Komar, P. D. 1978)

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**Caves:** Button Springs Cave (Carson, C. V. 1979)

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**Pacific Coast:** The fortieth annual meeting of the association of Pacific Coast Geographers (Anonymous. 1978)

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### Geophysical methods—Electromagnetic methods

**Instruments:** Design and application of a mega-moment electromagnetic dipole source (Riveros, C. A. 1979)

### Geophysical methods—Infrared methods

**Interpretation:** Visible and near-infrared spectra of rocks from chromium-rich areas (Hunt, G. R. 1979)

### Geophysical methods—Seismic methods

**Applications:** Crustal thickness in northern Nevada from seismic refraction profiles (Stauber, D. A. 1978)

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— Alvord Valley, Oregon geothermal investigation (Cleary, J. G. 1976)

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- Well-logging:** Geophysical logs, Old Maid Flat 1, Clackamas County, Oregon (Anonymous. 1978)

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**Geosynclines** see also Orogeny

**Geosynclines—Evolution**

**Cordilleran Geosyncline:** Mesozoic construction of the Cordilleran "collage", central British Columbia to central California (Davis, G. A. 1978)

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**Geothermal energy** see also under Economic geology; see also under Economic geology under Basin and Range Province; Pacific Coast; Western U.S.

**Geothermal energy—Exploration**

**Electromagnetic methods:** Design and application of a mega-moment electromagnetic dipole source (Riveros, C. A. 1979)

**Geothermal energy—Properties**

**Reservoir rocks:** Research on the physical properties of geothermal reservoir rock; quarterly report, March 1978 (Keller, G. V. 1978)

**Glacial geology** see also Geomorphology

**Glacial geology—Glacial features**

**Cirques:** Comparison of relative age dating (RAD) data from eastern Sierra Nevada cirque deposits with those from the tephrochronologically age controlled deposits of the Wallowa Mountains, Oregon (Burke, R. M. 1978)

**Glacial geology—Glaciation**

**Deposition:** Steens Mountain, Oregon (Lund, E. H. 1976)

**Extent:** Quaternary geology of the Pacific Northwest (Easterbrook, D. J. 1976)

— Quaternary glaciation and volcanism, Metolius River area, Oregon (Scott, W. E. 1977)

**Glacial geology—Glaciers**

**Meltwater:** Geology and hydrology of the Lost Creek glacial trough (Lund, E. H. 1977)

**Glacial geology—Periglacial features**

**Floodplains:** Late Pleistocene sediments and floods in the Willamette Valley (Allison, I. S. 1978)

**Glaciation** see under Glacial geology

**Glaciers** see under Glacial geology

**Gold** see also under Economic geology

**Grabens** see under Systems under Faults

**Graded bedding** see under Environmental analysis under Sedimentary structures; see under Interpretation under Sedimentary structures

**Granite** see also under Granite-granodiorite family under Igneous rocks

**Granodiorite** see under Granite-granodiorite family under Igneous rocks

**Graptolithina—Biostratigraphy**

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**Great Basin—Hydrogeology**

**Hydrology:** A trace of desert waters; the Great Basin story (Houghton, S. G. 1976)

**Springs:** Geothermal investigation of the Alvord Valley, Southeast Oregon (Cleary, J. G. 1976)

**Great Basin—Stratigraphy**

**Cambrian:** Middle Cambrian trilobite biostratigraphy of the Great Basin (Robison, R. A. 1976)

**Holocene:** Holocene environmental change in the Great Basin (Elston, R. 1976)

**Great Basin—Structural geology**

**Neotectonics:** Late Cenozoic tectonic evolution of the western United States (Livaccari, R. F. 1979)

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**Ground water—Contamination**

**Water resources:** Protection of ground water from nonpoint sources of pollution (Schmidt, K. D. 1977)

**Ground water—Geochemistry**

**Metamorphic rocks:** A model for fluids in metamorphosed ultramafic rocks (Pfeifer, H. R. 1977)

**Ground water—Surveys**

**Pacific Coast:** Ground-water levels in the United States, 1971-74; Northwestern States (U. S. Geological Survey. 1977)

**Regional:** Electrical resistivity survey and evaluation of the Glass Buttes geothermal anomaly, Lake County, Oregon (Hull, Donald A. 1976)

— Ground water conditions on the Harbor Bench, southwestern Curry County, Oregon (Lissner, F. G. 1977)

— Ground-water data in the Baker County-northern Malheur County area, Oregon (Collins, C. A. 1979)

— Ground water in southern Douglas County (Frank, F. J. 1978)

— Ground water in the Harrisburg-Halsey area, southern Willamette Valley, Oregon (Frank, F. J. 1976)

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— High arsenic concentrations in ground-water samples from northern Malheur County (Gonthier, J. B. 1979)

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**Heavy minerals** see also under Economic geology; Placers

**Helium—Isotopes**

**He-3:** Excess  $^3\text{He}$  and  $^{21}\text{Ne}$  in joesphinite (Bochsler, P. 1978)

**Ratios:** Noble gases in the upper mantle (Basu, A. R. 1977)

**Holocene** see also under Geochronology; Stratigraphy; see also under Geochronology under Pacific Coast; see also under Stratigraphy under Great Basin

**Holocene—Stratigraphy**

**Biostratigraphy:** Radiolarian ratios and Pleistocene-Holocene boundary (McMillen, K. J. 1979)

**Hydration of glass** see under Geochronology

**Hydrocarbons** see under Organic materials

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**Hydrogen—Abundance**

**Josephinite:** Rare gases and hydrogen in joesphinite (Craig, H. 1979)

**Hydrogen—Isotopes**

**D/H:** Geochemical studies of rocks, water, and gases at Mt. Hood, Oregon (Wollenberg, Harold A. 1979)

**Hydrogeology** see also Ground water; Hydrology

**Hydrogeology**

**Ground water:** Ground water conditions on the Harbor Bench, southwestern Curry County, Oregon (Lissner, F. G. 1977)

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- Irrigation-return flow from pastures and orchards in Bear Creek basin, Jackson County (McKenzie, S. W. 1979)
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- Physicochemical and biological characteristics of Hills Creek reservoir (Scheidt, R. C. 1976)
- Rainfall-runoff data for selected basins, Portland, Oregon, and Vancouver, Washington, 1973-77 (Laenen, A. 1978)
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- Stream sediment geochemistry, northeastern Oregon (Anonymous. 1976)
- Streets contribute much lead to urban runoff (Miller, T. L. 1978)
- Water-quality data from five Oregon stream basins (Miller, T. L. 1979)
- Water quality of active and inactive log ponds (Rinella, J. F. 1978)
- Maps:** Geology and hydrology of the Lost Creek glacial trough (Lund, E. H. 1977)
- Ground water in the Harrisburg-Halsey area, southern Willamette Valley, Oregon (Frank, F. J. 1976)
- Low- to intermediate-temperature thermal springs and wells in Oregon (Bowen, Richard G. 1978)
- Springs:** Alvord Valley, Oregon geothermal investigation (Cleary, J. G. 1976)
- Geochemical studies of rocks, water, and gases at Mt. Hood, Oregon (Wollenberg, Harold A. 1979)
- Hydrogeologic appraisal of the Klamath Falls geothermal area, Oregon (Sammel, E. A. 1980)
- Thermal waters:** Alvord Valley, Oregon geothermal investigation (Cleary, J. G. 1976)
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### Hydrogeology—Methods

- Remote sensing:** Use of earth satellites for automation of hydrologic data collection (Paulson, R. W. 1978)

### Hydrology *see also* Ground water; Hydrogeology

#### Hydrology—Limnology

- Geochemistry:** Behavior of major solutes during closed-basin brine evolution (Eugster, H. P. 1979)

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- Alesa River:** A biogeochemical study of manganese in the estuarine zone (Flegal, A. R., Jr. 1979)

- Columbia River:** Decline of radioactivity in the Columbia River and estuary; rates and mechanisms (Johnson, V. G. 1978)

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### Igneous rocks *see also* Magmas; Metamorphic rocks; Metasomatism; Phase equilibria

### Igneous rocks—Alkali basalt family

- Tephrite:** Morphologic parameters of Mount Mazama and Glacier Peak tephras; a scanning-electron microscope study (Tucker, G. B. 1977)

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- Batholiths:** An early Mesozoic alkalic magmatic belt in western North America (Miller, C. F. 1978)

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- Andesite:** Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)

- Uranium contents of glassy and devitrified andesites and dacites, Mount Mazama, Oregon (Noble, D. C. 1980)

- Volcanic petrology of the Eocene Clarno Formation on the John Day River near Cherry Creek, Oregon (Noblett, J. B. 1980)

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- Quartz latite:** Quartz latite (delle-nite), QLO-1, from southeastern Oregon (Walker, G. W. 1976)

- Rhyolite:** Rhyolitic volcanism in southeastern Oregon and the Snake River plain, Idaho; similarities and contrasts (Walker, G. W. 1977)

### Igneous rocks—Basalt family

- Age:** K/Ar and  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of assumed Columbia River Basalt equivalents in the western Cascades of Oregon (Lux, D. R. 1978)

- Basalt:** Basalt geology of eastern Oregon (Farroqui, Shannon and Wilson. 1978)

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*Mineral composition:* Crystal clots, amphibole fractionation, and the evolution of calc-alkaline magmas (Garcia, M. O. 1977)

*Petrology:* Crystal clots, amphibole fractionation and the evolution of calc-alkaline magmas (Garcia, M. O. 1979)

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*Mineral composition:* Volcanoes and plutons in magmatic arcs (Eichelberger, J. C. 1978)

### Igneous rocks—Diorite family

*Diorite:* Evidence for magmatic assimilation in several diorites of the middle Columbia River gorge (Free, M. R. 1976)

### Igneous rocks—Gabbro family

*Textures:* Textural banding in igneous rocks; an example from southwestern Oregon (Jorgenson, D. B. 1979)

### Igneous rocks—Geochemistry

*Genesis:* Rb-Sr and K-Ar geochronometry of granitic rocks west of the Idaho Batholith in western Idaho and Northeast Oregon (Armstrong, R. L. 1976)

*Isotopes:* Lead isotopic results from rocks from the central Andes; a comparison with data from other orogenic volcanic rocks in crustal arcs (Church, S. E. 1976)

### Igneous rocks—Granite-granodiorite family

*Granite:* Major element geochemistry and origin of albite granite near Sparta, Oregon (Almy, R. 1978)

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*Granodiorite:* Geology of the Quartzburg mining district, Grant County, Oregon (Johnson, F. R. 1975)

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*Lithostratigraphy:* Geology of the Bachelor Mountain area, Linn and Marion counties, Oregon (Rollins, A. 1976)

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*Ash-flow tuff:* Revisions to the Cenozoic stratigraphy of Harney Basin, southeastern Oregon (Walker, G. W. 1979)

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*Dunite:* Formation of small dunite bodies from harzburgite by metasomatic transformation in the Canyon Mountain ophiolite, Oregon (Dungan, M. A. 1976)

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— Structure of the Vulcan Peak alpine-type peridotite, southwestern Oregon (Loney, R. A. 1976)

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*Basalt:* Geology and structure of the Brothers fault zone in the central part of the Millican SE Quadrangle, Deschutes County, Oregon (Tucker, E. R. 1975)

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- Geochemistry:** A tectonic interpretation of strontium isotopic variations in late Cenozoic lavas; Western U.S. (Leeman, W. P. 1979)
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- Lithostratigraphy:** The Permian and Triassic Seven Devils Group, western Idaho and northeastern Oregon (Vallier, T. L. 1977)
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- Rhyolite:** Late Cenozoic ash-flow tuffs and their vents, eastern Oregon (Walker, G. W. 1976)
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- Ignimbrite** *see under* Pyroclastics and glasses *under* Igneous rocks
- Impact features** *see under* Geomorphology
- Impact statements** *see also under* Environmental geology; *see also under* Environmental geology *under* Western U.S.
- Inclusions—Mineral inclusions**
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- Host materials:** Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)
- Industrial minerals** *see also under* Economic geology *under* Pacific Coast; Western U.S.
- Inert gases** *see* Noble gases
- Infrared surveys** *see under* Geophysical surveys; *see under* Geophysical surveys *under* Pacific Coast
- Intrusions—Age**
- Absolute age:** Rb-Sr and K-Ar geochronometry of Mesozoic granitic rocks and their Sr isotopic composition, Oregon, Washington, and Idaho (Armstrong, R. L. 1977)
- Intrusions—Batholiths**
- Age:** Rb-Sr and K-Ar geochronometry of granitic rocks west of the Idaho Batholith in western Idaho and Northeast Oregon (Armstrong, R. L. 1976)
- Composition:** An early Mesozoic alkalic magmatic belt in western North America (Miller, C. F. 1978)
- Emplacement:** Subduction, accretion, and batholith emplacement (Gastil, R. G. 1978)
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- Intrusions—Dikes**
- Crystallization:** Evidence of partial melting and fractional crystallization of Columbia River Basalt magmas, Oregon and Washington (Ross, M. E. 1979)
- Emplacement:** Evolution of composite volcanoes; the role of dike and sill emplacement within the volcanic edifice (Crowe, B. 1978)
- Geochemistry:** An evaluation of dike-flow correlations indicated by geochemistry, Chief Joseph Swarm, Columbia River Basalt (Price, S. A. M. 1977)
- Orientation:** Gently dipping feeder dikes for Columbia River Basalt Group (Swanson, D. A. 1978)
- Paleomagnetism:** Tectonic rotation of the Oregon Coast Range (Cox, A. 1977)
- Swarms:** Some implications of sheeted dike swarms in ophiolitic complexes (Thayer, T. P. 1978)

## Isotopes

### Isotopes—Lead

**Pb-206/Pb-204:** The Cascade Mountains revisited; a re-evaluation in light of new lead isotopic data (Church, S. E. 1976)

**Ratios:** Lead isotopic results from rocks from the central Andes; a comparison with data from other orogenic volcanic rocks in crustal arcs (Church, S. E. 1976)

— Regional variations in the lead isotopic characteristics of late Cenozoic basalts from the southwestern United States (Everson, J. E. 1979)

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**Mn-56:** A biogeochemical study of manganese in the estuarine zone (Flegal, A. R., Jr. 1979)

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**Abundance:** Anomalous noble gases in joshophinite and associated rocks? (Bernatowicz, T. J. 1979)

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**Analysis:** Excess  $^3\text{He}$  and  $^{21}\text{Ne}$  in joshophinite (Bochsler, P. 1978)

**Ratios:** Rare gases and hydrogen in joshophinite (Craig, H. 1979)

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**O-18/O-16:** Direct marine-continental correlation; 150,000-year oxygen isotope-pollen record from the North Pacific (Heusser, L. E. 1979)

### Isotopes—Radium

**Ra-226:** Geochronology on Cascadia abyssal plain using high resolution gamma ray spectrometry (Cutshall, N. H. 1978)

### Isotopes—Ratios

**Ground water:** Geochemical studies of rocks, water, and gases at Mt. Hood, Oregon (Wollenberg, Harold A. 1979)

### Isotopes—Strontium

**Sr-87/Sr-86:** A tectonic interpretation of strontium isotopic variations in late Cenozoic lavas; Western U.S. (Leeman, W. P. 1979)

— Diagenetic alteration and formation of authigenic minerals in the Miocene "Rome Beds", Southeast Oregon (Campion, K. M. 1979)

— Geochemistry and origin of basalt of the Columbia River Group, Oregon and Washington (McDougall, I. 1976)

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— Some quantitative aspects of orogenic volcanism in the Oregon Cascades (McBirney, A. R. 1977)

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**Xe-129:** Joshophinite; a terrestrial alloy with radiogenic xenon-129 and the noble gas imprint of iron meteorites (Downing, R. G. 1977)

## Joints

**Joints** *see under Style under Fractures*

**Jurassic** *see also under Stratigraphy*

**Krypton—Isotopes**

— Noble gases in the upper mantle (Basu, A. R. 1977)

**Lakes** *see under Environment under Sedimentation; see under Lacustrine features under Geomorphology*

**Land use** *see also under Engineering geology; Environmental geology; see also under Environmental geology under Automatic data processing; Pacific Coast*

**Land use—Inventory**

— Land use analysis in unurbanized areas (Jensen, J. R. 1979)

**Landform description** *see under Geomorphology*

**Landslides** *see under Mass movements under Geomorphology*

**Lava** *see also Igneous rocks; Magmas*

**Lava—Age**

— K-Ar geochronology and stratigraphy of the Roxy, Wasson, and Heppis formations, southern Oregon (Smith, J. G. 1977)

— K/Ar and  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of assumed Columbia River Basalt equivalents in the western Cascades of Oregon (Lux, D. R. 1978)

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—  $^{40}\text{Ar}-^{39}\text{Ar}$  geochronology of basalts from ocean basins; some successes with samples from aseismic ridges (Duncan, R. A. 1978)

**Lava—Composition**

— Petrology and evolution of Mount Mazama (Crater Lake); a geochemical study (Leeman, W. P. 1979)

**Lava—Distribution**

— Rhyolitic volcanism in southeastern Oregon and the Snake River plain, Idaho; similarities and contrasts (Walker, G. W. 1977)

**Lava—Genesis**

— Isostasy and petrogenesis (Abramovich, I. I. 1977)

**Obsidian:** Obsidian and its formation (Bakken, B. 1977)

**Lava—Geochemistry**

— Isotopes: A tectonic interpretation of strontium isotopic variations in late Cenozoic lavas; Western U.S. (Leeman, W. P. 1979)

— Lava flows: An evaluation of dike-flow correlations indicated by geochemistry, Chief Joseph Swarm, Columbia River Basalt (Price, S. A. M. 1977)

— Petrology of the Strawberry Volcanics, NE Oregon (Robyn, T. L. 1978)

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**Trace elements:** Miocene volcanism in eastern Oregon; an example of calc-alkaline volcanism unrelated to subduction (Robyn, T. L. 1979)

— The stratigraphy and petrogenesis of the Grande Ronde Basalt in the lower Salmon and adjacent Snake River canyons (Reidel, S. P. 1978)

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**Uranium:** Uranium contents of glassy and devitrified andesites and dacites, Mount Mazama, Oregon (Noble, D. C. 1980)

**Lava—Observations**

— Lava flows: Newberry Volcano, Oregon; preliminary results of new field investigations (MacLeod, N. S. 1978)

**Lava—Petrology**

— Andesite: Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)

**Cenozoic:** The geology of Jordan Craters, Malheur County, Oregon (Otto, B. R. 1977)

— Lava flows: Chemistry, petrography, and stratigraphy of the Columbia River Group in the Imnaha River valley region, eastern Oregon and western Idaho (Kleck, W. D. 1976)

— Stratigraphy, structure, and petrology of Columbia River Basalt in a portion of the Grande Ronde River - Blue Mountains area of Oregon and Washington (Ross, M. E. 1978)

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**Lava—Properties**

— Magnetic properties: Magnetostratigraphy and correlation of Miocene basalts of the northern Oregon coast and Columbia Plateau, Southeast Washington (Choiniere, S. R. 1979)

— Magnetostratigraphy of the Imnaha and Grande Ronde basalts in the southeast part of the Columbia Plateau (Hooper, P. R. 1979)

**Lava—Structure**

— Lava caves: The lava caves of Saddle Butte (Carson, C. V. 1977)

— Lava flows: Stratigraphy and structure of the Columbia River Basalt in the Cascade Range, Oregon (Beeson, Marvin H. 1979)

**Lead—Abundance**

— Water: Stream sediment geochemistry, northeastern Oregon (Anonymous. 1976)

— Streets contribute much lead to urban runoff (Miller, T. L. 1978)

**Lead—Isotopes**

— Ratios: Lead isotopic results from rocks from the central Andes; a comparison with data from other orogenic volcanic rocks in crustal arcs (Church, S. E. 1976)

— Regional variations in the lead isotopic characteristics of late Cenozoic basalts from the southwestern United States (Everson, J. E. 1979)

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**Limestone** *see also under Carbonate rocks under Sedimentary rocks*

**Limnology** *see under Hydrology*

**Lineation** *see also Foliation; Structural analysis*

**Lithium** *see also under Economic geology*

**Magmas** *see also Igneous rocks; Intrusions; Lava*

**Magmas—Differentiation**

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— Evolution: Some quantitative aspects of orogenic volcanism in the Oregon Cascades (McBirney, A. R. 1977)

— Fractional crystallization: Climactic eruption of Crater Lake, Oregon; evidence for crystal fractionation in a water-undersaturated magma (Ritchey, J. L. 1979)

— Evidence of partial melting and fractional crystallization of Columbia River Basalt magmas, Oregon and Washington (Ross, M. E. 1979)

— Origin of divergent magmas at Crater Lake, Oregon (Ritchey, J. L. 1979)

— Petrology and evolution of Mount Mazama (Crater Lake); a geochemical study (Leeman, W. P. 1979)

— Stratigraphy, structure, and petrology of Columbia River Basalt in a portion of the Grande Ronde River - Blue Mountains area of Oregon and Washington (Ross, M. E. 1978)

— Volcanic petrology of the Eocene Clarno Formation on the John Day River near Cherry Creek, Oregon (Noblett, J. B. 1980)

**Geochemistry:** Geochemistry and origin of basalt of the Columbia River Group, Oregon and Washington (McDougall, I. 1976)

**Lava:** Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)

**Mixing:** Climactic eruptions of Crater Lake; evidence for an early stage of mixing within a pluton (Eichelberger, J. C. 1978)

— Volcanoes and plutons in magmatic arcs (Eichelberger, J. C. 1978)

**Temperature:** Studies of phase relations in subalkaline volcanic rock series (Osborn, E. F. 1977)

**Volcanic rocks:** Origin of a continental calc-alkaline volcanic suite, NE Oregon (Robyn, T. L. 1977)

— Petrology of the Strawberry Volcanics, NE Oregon (Robyn, T. L. 1978)

**Magmas—Evolution**

— Calc-alkalic composition: Crystal clots, amphibole fractionation and the evolution of calc-alkaline magmas (Garcia, M. O. 1979)

— Fractionation: Crystal clots, amphibole fractionation, and the evolution of calc-alkaline magmas (Garcia, M. O. 1977)

**Genesis:** Magmatic evolution of the central Oregon Cascades (McBirney, A. R. 1976)

## Maps

**Magmas—Genesis**

**Concepts:** Some geologic constraints on models for magma generation in orogenic environments (McBirney, A. R. 1976)

**Properties:** Inferred depths of origin of High Cascade magmas (Goles, G. G. 1977)

**Magmas—Geochemistry**

**Contamination:** A tectonic interpretation of strontium isotopic variations in late Cenozoic lavas; Western U.S. (Leeman, W. P. 1979)

**Magmas—Processes**

**Partial melting:** Evidence of partial melting in the Josephine Peridotite (Dick, H. J. B. 1977)

**Magmas—Properties**

**Viscosity:** Viscosities of basalt and andesite melts at high pressures (Kushiro, I. 1976)

**Magmas—Temperature**

**Exsolution:** Vapor exsolution in andesitic and bimodal volcanism and an estimate of depth to magma (Eichelberger, J. C. 1979)

**Viscosity:** Obsidian and its formation (Bakken, B. 1977)

**Magmas—Viscosity**

**Pressure:** Viscosity of basalt and andesite magmas at high pressures (Kushiro, I. 1976)

**Magnetic field** *see under Earth*

**Magnetic surveys** *see under Geophysical surveys; see under Geophysical surveys under Columbia Plateau; Pacific Coast*

**Magnetotelluric surveys** *see under Geophysical surveys*

**Mammalia—Carnivora**

**Quaternary:** *Vulpes macrotis* (McGrew, J. C. 1979)

**Mammalia—Faunal studies**

**Miocene:** A new late Hemingfordian mammal fauna from the John Day Formation, Oregon, and its stratigraphic implications (Woodburne, M. O. 1977)

**Mammalia—Perissodactyla**

**Cenozoic:** Horse genealogy; the Oregon connection (Drake, E. T. 1978)

**Miocene:** Reevaluation of early Miocene North American *Moropus* (Perissodactyla, Chalicotheriidae, Schizotheriinae) (Coombs, M. C. 1978)

— *Tylocephalonyx*, a new genus of North American domed-skulled chalicotheres; Mammalia, Perissodactyla (Coombs, M. C. 1979)

**Mammalia—Rodentia**

**Neogene:** Hemphillian rodents from northern Oregon and their relationships to other rodent faunas in North America (Martin, J. E. 1979)

**Man, fossil** *see Fossil man*

**Manganese—Geochemistry**

**Sediments:** A biogeochemical study of manganese in the estuarine zone (Flegal, A. R., Jr. 1979)

**Mantle** *see also under Tectonophysics under Pacific Coast; Pacific region*

**Mantle—Composition**

**Gases:** Noble gases in the upper mantle (Basu, A. R. 1977)

**Maps** *see also under Areal geology; Economic geology; Environmental geology; Geophysical surveys; Hydrogeology; Oceanography; Pe-*

## Maps

tology; Stratigraphy; *see also under* Areal geology *under* Western U.S.; *see also under* Environmental geology *under* Western U.S.; *see also under* General *under* Pacific Coast; *see also under* Geomorphology *under* Pacific Coast; *see also under* Geophysical surveys *under* Columbia Plateau; *see also under* Tectonophysics *under* Pacific Coast

### Maps—Cartography

*Associations:* Annual report of the State Map Advisory Committee for Oregon 1979; January 1, 1979-December 31, 1979 (Beaulieu, John D. 1979)

**Marine geology** *see also* Oceanography

**Mass movements** *see under* Geomorphology

**Mathematical geology** *see also* Automatic data processing

**Meetings** *see* Symposia

**Mélange** *see under* Interpretation *under* Structural analysis; *see under* Provenance *under* Sedimentation

**Mercury** *see also under* Economic geology; *see also under* Economic geology *under* Western U.S.

### Mercury—Abundance

*Water:* Stream sediment geochemistry, northeastern Oregon (Anonymous. 1976)

**Mesozoic** *see also under* Geochronology; Stratigraphy; *see also under* Geochronology *under* Western U.S.; *see also under* Stratigraphy *under* Pacific Coast; Symposia; Western U.S.

**Metals** *see also* Arsenic; Economic geology; Lead; Manganese; *see also under* Economic geology *under* Symposia

**Metamorphic rocks** *see also* Igneous rocks; Metamorphism; Metasomatism

### Metamorphic rocks—Amphibolites

*Amphibolite:* Rogue River island arc complex, western Jurassic belt, Klamath Mountains, Oregon (Garcia, M. O. 1976)

— The amphibolite of Briggs Creek; a tectonic slice of metamorphosed oceanic crust in southwestern Oregon? (Coleman, R. G. 1976)

*Petrography:* Geology of the gabbroic complex along the northern border of the Josephine Peridotite, Vulcan Peak area, southwestern Oregon (Loney, R. A. 1977)

### Metamorphic rocks—Classification

*Josephinite:* Josephinite; a unique nickel-iron (Botto, R. I. 1976)

### Metamorphic rocks—Composition

*Ultramafic composition:* A model for fluids in metamorphosed ultramafic rocks (Pfeifer, H. R. 1977)

### Metamorphic rocks—Facies

*Amphibolite facies:* Contrasting metamorphic terrains of Siskiyou Mountains, Oregon-California (Ferns, M. L. 1978)

*Greenschist facies:* Contrasting metamorphic terrains of Siskiyou Mountains, Oregon-California (Ferns, M. L. 1978)

### Metamorphic rocks—Genesis

*Complexes:* Structures of the Canyon Mountain (Oregon) ophiolite complex (Ave Lallement, H. G. 1976)

*Plate tectonics:* Mesozoic tectonics of the western United States (Hamilton, W. B. 1978)

### Metamorphic rocks—Geochemistry

*Trace elements:* Petrogenesis of spinel and keraophyre from a Permian and Triassic volcanic arc terrane, eastern Oregon and western Idaho, U.S.A. (Vallier, T. L. 1978)

### Metamorphic rocks—Metaigneous rocks

*Genesis:* Emplacement of ultramafic rocks and metamorphism in the Marble Mountains area of the Klamath Mountains (Welsh, J. L. 1978)

*Metagabbro:* Complementary meta-gabbros and peridotites in the northern Klamath Mountains, U.S.A. (Kays, M. A. 1977)

— Textural banding in igneous rocks; an example from southwestern Oregon (Jorgenson, D. B. 1979)

*Ophiolite:* Geology and geochemistry of the Oregon Mountain area, southwestern Oregon and northern California (Vail, S. G. 1977)

### Metamorphic rocks—Metasedimentary rocks

*Facies:* Petrographic and structural reconnaissance of the Franciscan Complex (Dothan/Otter Point) in the Dillard Block, Southwest Oregon (Worley, P. L. H. 1978)

*Petrology:* Pre-Tertiary stratigraphy in the Snake River canyon and adjacent Seven Devils and Wallow Mountains, northeastern Oregon and western Idaho (Vallier, T. L. 1976)

### Metamorphic rocks—Metavolcanic rocks

*Geochemistry:* Petrology of the Rogue and Galice formations, Klamath Mountains, Oregon; identification of a Jurassic island arc sequence (Garcia, M. O. 1979)

*Lithostratigraphy:* Mesozoic metavolcanic sequences in the northern Klamath Mountains, southwestern Oregon (Johnson, M. G. 1977)

*Maps:* Preliminary geologic map of the metavolcanic rocks in part of the Canyonville, Days Creek, and Glendale quadrangles, Oregon (Johnson, M. G. 1979)

*Petrography:* Petrology and initial tectonic setting of Permian and Triassic volcanic rocks, northeastern Oregon and western Idaho (Batiza, R. 1976)

*Volcanism:* Petrology of the Rogue River area, Klamath Mountains, Oregon; problems in the identification of ancient volcanic arcs (Garcia, M. O. 1976)

### Metamorphic rocks—Petrology

*Lithostratigraphy:* Geology of part of southern Morrow County, Northeast Oregon (Shorey, E. F. 1976)

### Metamorphic rocks—Schists

*Blueschist:* Triassic blueschist from northern California and north-central Oregon (Hotz, P. E. 1977)

*Greenstone:* Alkalic pillowd greenstone, Greenhorn Mountains, Northeast Oregon (Mullen, E. D. 1979)

*Mineral assemblages:* Deformation and metamorphism of the schist of Condrey Mountain, Klamath Mountains, California and Oregon (Donato, M. M. 1979)

### Metamorphism—Age

*Absolute age:* Triassic blueschist from northern California and north-central Oregon (Hotz, P. E. 1977)

### Metamorphism—Evolution

*Schists:* Deformation and metamorphism of the schist of Condrey Mountain, Klamath Mountains, California and Oregon (Donato, M. M. 1979)

*Tertiary:* Tertiary evolution of Cordilleran metamorphic core complexes (Coney, P. J. 1979)

### Metamorphism—Processes

*Anatexis:* Compositional layering in alpine peridotites; evidence for pressure solution creep in the mantle (Dick, H. J. B. 1979)

*Recrystallization:* Textural banding in igneous rocks; an example from southwestern Oregon (Jorgenson, D. B. 1979)

### Metamorphism—Regional metamorphism

*Mineral assemblages:* Petrogenesis of spinel and keraophyre from a Permian and Triassic volcanic arc terrane, eastern Oregon and western Idaho, U.S.A. (Vallier, T. L. 1978)

### Metamorphism—Retrograde metamorphism

*Extent:* Emplacement of ultramafic rocks and metamorphism in the Marble Mountains area of the Klamath Mountains (Welsh, J. L. 1978)

### Metasomatic rocks—Serpentinite

*Composition:* Metallic mineralogy of serpentinites; implications for deep crustal magnetic anomalies (Leavell, D. N. 1978)

*Geochemistry:* Trace element abundances in Josephinite and related rocks (Goettel, K. A. 1978)

### Metasomatism—Materials

*Igneous rocks:* Formation of small dunite bodies by metasomatic transformation of harzburgite in the Canyon Mountain Ophiolite, Northeast Oregon (Dungan, M. A. 1977)

— Formation of small dunite bodies from harzburgite by metasomatic transformation in the Canyon Mountain ophiolite, Oregon (Dungan, M. A. 1976)

### Metasomatism—Processes

*Hydrothermal alteration:* Diagenetic and hydrothermal alteration, and trace element distribution in tuffaceous sediments within the McDermitt Caldera, Nevada-Oregon (Rytuba, J. J. 1977)

— Geology and mineralization of the North Santiam mining district, Marion County, Oregon (Olson, J. P. 1978)

## Mineral deposits, genesis

**Serpentinization:** Josephinite; a unique nickel-iron (Botto, R. I. 1976)

— The geology and distribution of Josephinite in the Josephine Peridotite, Southwest Oregon (Leavell, D. N. 1979)

**Zeolitization:** Zeolite-clay mineral zonation of volcanoclastic sediments within the McDermitt Caldera complex of Nevada and Oregon (Glanzman, R. K. 1979)

**Meteor craters** *see also* Meteorites

**Meteorites—Geochemistry**

*Iron meteorites:* Josephinite; a terrestrial alloy with radiogenic xenon-129 and the noble gas imprint of iron meteorites (Downing, R. G. 1977)

**Mineral deposits, genesis—Environment**

**Plate tectonics:** The Klamath Mountains and Sierra Nevada Jurassic volcanic arc sequences, western U.S.A.; volcanogenic sulfide provinces (Kemp, W. R. 1976)

**Mineral deposits, genesis—Gold**

**Mineralization:** Paragenesis and geochemistry of the Granite gold district, Grant County, Oregon (Young, James Stanton. 1979)

— Paragenesis of gold veins in the Granite District, Grant County, Oregon (Young, J. Stanton. 1979)

— Quartzville mining district (Munts, Steven Rowe. 1978)

**Mineral deposits, genesis—Metals**

**Massive deposits:** Geochemistry of a volcanogenic massive sulfide deposit, Blue Creek District, Oregon (Cunningham, C. T. 1978)

**Mineralization:** Geology and mineral deposits of the Bohemia mining district, Lane County, Oregon (Schaubs, Michael Paul. 1978)

**Processes:** Nazca Plate studied (Dasch, E. Julius. 1976)

**Mineral deposits, genesis—Processes**

**Epithermal processes:** Geology of the McDermitt Mine area, Humboldt County, Nevada (Speer, W. E. 1977)

**Hydrothermal processes:** Diagenetic and hydrothermal alteration, and trace element distribution in tuffaceous sediments within the McDermitt Caldera, Nevada-Oregon (Rytuba, J. J. 1977)

— Geology, petrology, and mineralization of the Paisley Mountains plutonic complex, Lake County, Oregon (Hammit, J. W. 1976)

**Igneous processes:** Mineral deposits of the Snake River canyon area, western Idaho and eastern Oregon (Field, C. W. 1976)

**Volcanism:** A model for the genesis of uranium/lithophile element deposits related to rhyolitic volcanism (Sheridan, M. F. 1979)

— Relation of mercury, uranium, and lithium deposits to the McDermitt caldera complex, Nevada-Oregon (Rytuba, J. J. 1978)

## Mineral deposits, genesis

— Some uranium deposits associated with volcanic rocks, western United States (Waters, A. C. 1978)

— Volcanogenic massive sulfide deposits in the northern Klamath Mountains, California and Oregon (Koski, R. A. 1979)

**Weathering:** The mineralogical and chemical development of the Nickel Mountain (Oregon) nickel laterite deposit (Durst, T. L. 1976)

### Mineral deposits, genesis—Uranium

**Mineralization:** Structural and petrologic associations of uranium deposits within the McDermitt caldera complex, Nevada-Oregon (Rytuba, J. J. 1979)

**Volcanism:** Uranium in volcanic environments in the Great Basin (Files, F. G. 1978)

### Mineral exploration—Geochemical methods

**Aureoles:** Alteration aureoles in McDermitt caldera in Nevada and Oregon (Rytuba, J. J. 1979)

**Stream sediments:** Hydrogeochemical and stream-sediment reconnaissance (HSSR) survey of the National Uranium Resource Evaluation (NURE) Program; western United States; quarterly progress report, July through September 1977 (Lawrence Livermore Laboratory, 1978)

**Surveys:** Geochemical anomalies associated with mercury deposits in Nevada and Oregon (Rytuba, J. J. 1978)

### Mineral exploration—Geophysical methods

**Radioactivity methods:** Uranium content of tuffaceous sediments and opaline mercury deposits within the McDermitt Caldera, Oregon-Nevada (Rytuba, J. J. 1977)

**Uranium:** Aerial gamma ray and magnetic survey, Idaho Project, Hailey, Idaho Falls, Elk City quadrangles of Idaho/Montana and Boise Quadrangle, Oregon/Idaho; final report (EG&G Geometrics, 1979)

### Mineral exploration—Methods

**Maps:** Mineral exploration potential maps (Anonymous, 1978)

### Mineral exploration—Remote sensing

**Landsat:** Satellite remote sensing of the McDermitt Caldera, Nevada-Oregon (Raynolds, R. G. H. 1976)

**Multispectral analysis:** Visible and near-infrared spectra of rocks from chromium-rich areas (Hunt, G. R. 1979)

**Spectral analysis:** Visible and near-infrared spectra of rocks from a chromite-rich area in Oregon (Hunt, G. R. 1979)

**Mineral inclusions** see under Inclusions

**Mineral prospecting** see Mineral exploration

**Mineral resources** see also under Economic geology

## Mineralogy

**Framework silicates:** A pleochroic variety of gem labradorite from the Rabbit Hills area, Lake County, Oregon (Carlson, E. H. 1976)

— Beach treasures of Whiskey Run (Heflin, E. 1979)

— Chabazite in siliceous tuffs of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J. III. 1976)

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— Characterization of an offretite-levynite intergrowth from Beech Creek, Oregon, by adsorption and electron diffraction (Bennett, J. M. 1976)

— Dachiardite-bearing zeolite assemblages in the Pacific Northwest (Wise, W. S. 1976)

— Levyne in the Wallows (Howard, D. G. 1978)

— The structure of lawsonite, a strontium analog of paracelsian (Griffen, D. T. 1977)

**Native elements and alloys:** Geology, petrography and origin of josephinite (Weathers, M. S. 1976)

— Josephinite; a unique nickel-iron (Botto, R. I. 1976)

— Josephinite; a unique nickel-iron (Botto, R. I. 1976)

— Josephinite; crystal structures and phase relations of the metals (Bassett, W. A. 1979)

— Josephinite; specimens from the Earth's core? (Dick, H. J. B. 1976)

— Mantle-derived iron-nickel alloys (Weathers, M. S. 1978)

— Origin and mineral chemistry of "josephinite" (Thornber, C. R. 1976)

— Origin of josephinite (Bird, J. M. 1979)

— The geology and distribution of josephinite in the Josephine Peridotite, Southwest Oregon (Leavell, D. N. 1979)

— Widmanstätten patterns in josephinite (Bird, J. M. 1978)

**Orthosilicates:** Zircons of Summit Rock, Oregon (Hunke, J. C. 1978)

**Ring silicates:** Osumilite; channel ions, water and biaxiality (Goldman, D. S. 1977)

**Minerals** see also Crystal chemistry; Crystal growth; Crystal structure

**Minerals—Chain silicates,**

**amphibole group**

**Amphibole:** Amphibole stability in a differentiated calc-alkaline magma chamber; an experimental investigation (Ritchey, J. L. 1978)

**Minerals—Framework silicates**

**Lawsonite:** The structure of lawsonite, a strontium analog of paracelsian (Griffen, D. T. 1977)

**Minerals—Framework silicates,**

**feldspar group**

**Albite:** Major element geochemistry and origin of albite granite near Sparta, Oregon (Almy, R. 1978)

**Labradorite:** A pleochroic variety of gem labradorite from the Rabbit Hills area, Lake County, Oregon (Carlson, E. H. 1976)

## Minerals—Framework silicates, silica minerals

**Agate:** Beach treasures of Whiskey Run (Heflin, E. 1979)

— Inclusions in agate and their origins and significance (Pabian, R. K. 1978)

## Minerals—Framework silicates, zeolite group

**Chabazite:** Chabazite in siliceous tuffs of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J. III. 1976)

— Chabazite in siliceous tuffs of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J. III. 1978)

**Dachiardite:** Dachiardite-bearing zeolite assemblages in the Pacific Northwest (Wise, W. S. 1976)

**Levyne:** Levyne in the Wallows (Howard, D. G. 1978)

**Offretite:** Characterization of an offretite-levynite intergrowth from Beech Creek, Oregon, by adsorption and electron diffraction (Bennett, J. M. 1976)

— The chemical compositions and origin of the zeolites offretite, erionite, and levyne (Wise, W. S. 1976)

**Thomsonite:** Habits and crystal forms of thomsonite (Wise, W. S. 1977)

— Habits and crystal forms of thomsonite (Wise, W. S. 1977)

**Minerals—Miscellaneous minerals**

**Composition:** Partial melting in the Josephine Peridotite; I. The effect on mineral composition and its consequence for geobarometry and geothermometry (Dick, H. J. B. 1977)

## Minerals—Native elements and alloys

**Josephinite:** Anomalous noble gases in josephinite and associated rocks? (Bernatowicz, T. J. 1979)

— Excess  ${}^3\text{He}$  and  ${}^{21}\text{Ne}$  in josephinite (Bochsler, P. 1978)

— Geology, petrography and origin of josephinite (Weathers, M. S. 1976)

— Josephinite; a terrestrial alloy with radiogenic xenon-129 and the noble gas imprint of iron meteorites (Downing, R. G. 1977)

— Josephinite; a unique nickel-iron (Botto, R. I. 1976)

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— Josephinite; crystal structures and phase relations of the metals (Bassett, W. A. 1979)

— Josephinite; specimens from the Earth's core? (Dick, H. J. B. 1976)

— Mantle-derived iron-nickel alloys (Weathers, M. S. 1978)

— Origin and mineral chemistry of "josephinite" (Thornber, C. R. 1976)

— Origin of josephinite (Bird, J. M. 1979)

— Rare gases and hydrogen in josephinite (Craig, H. 1979)

— The geology and distribution of josephinite in the Josephine Peridotite, Southwest Oregon (Leavell, D. N. 1979)

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— Trace element abundances in josephinite and related rocks (Goettl, K. A. 1978)

— Widmanstätten patterns in josephinite (Bird, J. M. 1978)

**Magnetic properties:** Metallic mineralogy of serpentinites; implications for deep crustal magnetic anomalies (Leavell, D. N. 1978)

## Minerals—Occurrence

**Pyroclastics:** Zeolite-clay mineral zonation of volcaniclastic sediments within the McDermitt Caldera complex of Nevada and Oregon (Glanzman, R. K. 1979)

## Minerals—Orthosilicates

**Zircon:** Zircons of Summit Rock, Oregon (Hunke, J. C. 1978)

## Minerals—Orthosilicates, olivine group

**Olivine:** Electron-microprobe analyses of chromite and olivine from alpine ultramafic complexes (Bird, M. L. 1977)

## Minerals—Oxides

**Chromite:** Electron-microprobe analyses of chromite and olivine from alpine ultramafic complexes (Bird, M. L. 1977)

## Minerals—Ring silicates

**Osumilite:** Osumilite; channel ions, water and biaxiality (Goldman, D. S. 1977)

— The site distribution of iron and anomalous biaxiality in osumilite (Goldman, D. S. 1978)

## Minerals—Sheet silicates

**Biotite:** Age of quartz diorite at Bishop Spring in northwestern Oregon (Poole, F. G. 1978)

## Minerals—Sheet silicates, clay minerals

**Hectorite:** New occurrences of the lithium-rich smectite, hectorite (Glanzman, R. K. 1978)

## Minerals—Silicates

**Authigenic minerals:** Diagenetic alteration and formation of authigenic minerals in the Miocene "Rome Beds", Southeast Oregon (Campion, K. M. 1979)

## Minerals—Sulfides

**Wilburite:** Josephinite; a unique nickel-iron (Botto, R. I. 1976)

## Mining geology—Methods

**Recovery:** Mining in the Oregon Cascades (Mason, R. S. 1978)

**Miocene** see also under Stratigraphy; see also under Stratigraphy under Columbia Plateau; Pacific Coast

## Mollusca—Biochemistry

**Amino acids:** Role of thermal history uncertainties in amino-acid racemization age estimation of geological and archeological samples (Wehmiller, J. F. 1979)

## Mollusca—Biostratigraphy

**Cenozoic:** Cenozoic molluscan stages of Oregon and Washington (Armentrout, J. M. 1977)

— Late Cenozoic marine invertebrates from Northwest California and Southwest Oregon (Roth, B. 1979)

— Progress report on Cenozoic correlations, west coast North America (Armentrout, J. M. 1978)

**Jurassic:** Biostratigraphy of the Snowshoe Formation (Jurassic) in the Izee area, Grant County, Oregon (Smith, P. L. 1976)

## Mollusca

— Biostratigraphy of the type Weberg Member, Snowshoe Formation, Grant County, Oregon (Taylor, D. G. 1977)

**Miocene:** Neogene molluscan stages of Oregon and Washington (Addicott, W. O. 1976)

— New Miocene formation at Coos Bay, Oregon (Armentrout, J. M. 1978)

**Neogene:** Pacific Coast Neogene correlations; a progress report (Armentrout, J. M. 1979)

**Tertiary:** Neogene molluscan stages of Oregon and Washington (Addicott, W. O. 1976)

— Significance of pectinids in Tertiary biochronology of the Pacific Northwest states (Addicott, W. O. 1977)

### Mollusca—Bivalvia

**Miocene:** Marine fossils on Oregon beaches (Heflin, E. 1979)

**Quaternary:** Amino-acid racemization dating of Quaternary mollusks, Pacific Coast United States (Wehmiller, J. F. 1978)

### Mollusca—Cephalopoda

**Cretaceous:** First occurrence, systematics, and functional morphology of Nipponites (Cretaceous Lytoceratina) from the Americas (Ward, P. D. 1977)

### Mollusca—Faunal studies

**Pleistocene:** Community succession of Pioneer Terrace molluscan fauna, Cape Blanco, Oregon (Armentrout, J. M. 1978)

### Mollusca—Gastropoda

**Cenozoic:** Molluscan paleoecology and biostratigraphy of Cenozoic deep-water facies in the Pacific Northwest (Hickman, C. S. 1977)

— Pleurotomaria (Archaeogastropoda) in the Eocene of the northeastern Pacific; a review of Cenozoic biogeography and ecology of the genus (Hickman, C. S. 1976)

**Miocene:** Big Seffy (Stafford, W. L. 1979)

**Tertiary:** Bathyal gastropods of the family Turridae in the early Oligocene Keasey Formation in Oregon, with a review of some deep-water genera in the Paleogene of the eastern Pacific (Hickman, C. S. 1976)

### Mud volcanoes see also Volcanology

### Native elements and alloys see under Minerals

### Natural gas see also under Economic geology

**Neogene** see also under Geochronology; Stratigraphy; see also under Stratigraphy under Pacific Coast; Pacific region; Western U.S.

### Neon—Isotopes

**Ne-21:** Excess  $^{3}\text{He}$  and  $^{21}\text{Ne}$  in josephinite (Bochsler, P. 1978)

**Ratios:** Noble gases in the upper mantle (Basu, A. R. 1977)

**Neotectonics** see also under Structural geology; see also under Structural geology under Basin and Range Province; Columbia Plateau; Great Basin; Pacific Coast

**Nickel** see also under Economic geology

### Nickel—Abundance

**Water:** Stream sediment geochemistry, northeastern Oregon (Anonymous. 1976)

### Nickel—Geochemistry

**Igneous rocks:** Basalts of Oregon (U.S.A.) and their geotectonic environment; I, Petrochemistry of Tertiary basalts of the Oregon Coast Range (Loeschke, J. 1979)

### Nitrogen—Geochemistry

**Cycles:** Nitrous oxide and methane in Alsea Bay, Oregon (de Angelis, M. A. 1979)

**Sediments:** Sediment characteristics and the trophic status of four Oregon lakes (Davis, G. E. 1976)

### Noble gases see also Argon; Helium; Krypton; Neon; Xenon

### Noble gases—Abundance

**Josephinite:** Josephinite; a terrestrial alloy with radiogenic xenon-129 and the noble gas imprint of iron meteorites (Downing, R. G. 1977)

### Noble gases—Geochemistry

**Upper mantle:** Noble gases in the upper mantle (Basu, A. R. 1977)

### Noble gases—Isotopes

**Abundance:** Anomalous noble gases in josephinite and associated rocks? (Bernatowicz, T. J. 1979)

— Origin of josephinite (Bird, J. M. 1979)

**Ratios:** Rare gases and hydrogen in josephinite (Craig, H. 1979)

### North America see also Rocky Mountains

### Nuclear facilities see also under Engineering geology

### Ocean circulation see also under Oceanography

### Ocean floors see also under Oceanography under Pacific Coast

### Ocean waves see also under Oceanography under Pacific Coast

### Oceanography

**Continental shelf:** A diagnostic model of continental shelf circulation (Peng, C. Y. 1976)

— Bathymetric map of Pacific Coast; Columbia River to Cape Ferrello, Oregon (Schumacher, G. M. 1977)

— Bottom nepheloid layers and bottom mixed layers observed on the continental shelf off Oregon (Pak, H. J. 1977)

— Optical evidence of sediment resuspension; Oregon continental shelf (Chriss, T. M. 1977)

**Continental slope:** Tectonic consolidation of deep-sea sediments; preliminary results of laboratory simulation (Carson, B. 1976)

**Maps:** Bathymetric map of Pacific Coast; Columbia River to Cape Ferrello, Oregon (Schumacher, G. M. 1977)

**Ocean circulation:** A diagnostic model of continental shelf circulation (Peng, C. Y. 1976)

— The viscous sublayer at the sea floor (Caldwell, D. R. 1979)

**Sedimentation:** Depositional environments within high-energy tidally dominated embayments along Pacific margin, United States (Rappeport, M. L. 1980)

— Suspended material over the central Oregon continental shelf

## Pacific Coast

### Pacific Coast—Areal geology

**Guidebook:** Geological excursions in the Pacific Northwest (Brown, E. H. 1977)

**Regional:** Pacific Coast region (Anonymous. 1978)

### Pacific Coast—Economic geology

**Energy sources:** Northwest Energy Policy Project energy supply and environmental impacts, study module III-A final report; conventional energy sources (McFadden, J. 1977)

— Northwest Energy Policy Project; institutional constraints and opportunities study module V, report on tasks 4, 5, 6, & 7, final report 1977 (Balmer, D. G. 1977)

**Geothermal energy:** A comparison of electromagnetic and magnetotelluric surveys (Morrison, H. F. 1979)

— Characteristics of geothermal reservoirs associated with composite cones as estimated by simple models of eruption dynamics and petrogeneses; Newberry and Mt. Jefferson as examples (Goles, G. G. 1978)

— Exploration for geothermal energy in the Pacific Northwest (Pilkington, H. D. 1978)

— Pacific Northwest geothermal; 1976 review, 1977 outlook (Youngquist, W. 1977)

— Research and development toward abundant and economical geothermal energy in the Northwest (Kunze, J. F. 1978)

**Gravel:** Geology of the continental margin near Florence, Oregon (Couch, Richard. 1979)

— Offshore sand and gravel resources of the Pacific Northwest (Moore, G. W. 1979)

— Offshore sand and gravel resources of the Pacific Northwest (Moore, G. W. 1979)

**Industrial minerals:** Chabazite in siliceous tufts of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J., III. 1978)

**Iron:** Volcanogenic massive sulfide deposits in the northern Klamath Mountains, California and Oregon (Koski, R. A. 1979)

**Oil and gas fields:** Mist gas field, Columbia County, Oregon (Bruer, W. G. 1980)

**Petroleum:** A synthesis of OCS well information, offshore central and northern California, Oregon, and Washington (Ziegler, D. L. 1978)

— California to Washington (Anonymous. 1978)

— Developments in West Coast area in 1977 (Cassell, J. K. 1978)

— Interim report on petroleum resources potential and geologic hazards in the outer continental shelf; Oregon and Washington Tertiary province (Snavely, P. D., Jr. 1977)

**Sand:** Offshore sand and gravel resources of the Pacific Northwest (Moore, G. W. 1979)

### Pacific Coast—Engineering geology

**Geologic hazards:** Petroleum resources potential and geologic hazards of the Oregon-Washington outer continental shelf (Snavely, P. D., Jr. 1978)

## Pacific Coast

**Waste disposal:** Stability of dredged material deposited seaward of the Columbia River mouth (Sternberg, R. W. 1979)

### Pacific Coast—Environmental geology

**Ecology:** Mountains of the Pacific Northwest, U.S.A.; a study in contrasts (Price, L. W. 1978)

**Geologic hazards:** A synoptic approach for analyzing erosion as a guide to land-use planning (Brown, W. M., III. 1979)

— Environmental geology of the Kellogg Creek - Mt. Scott Creek and lower Clackamas River drainage areas, northwestern Clackamas County, Oregon (Brunengo, M. J. 1978)

— Interim report on petroleum resources potential and geologic hazards in the outer continental shelf; Oregon and Washington Tertiary province (Snavely, P. D., Jr. 1977)

**Land use:** Land use and land cover research and analysis (Davis, D. W. 1978)

— Pacific Northwest Demonstration Project (Hood, D. R. 1978)

— Pacific Northwest Regional Commission (Hood, D. R. 1979)

**Pollution:** Mathematical simulation of sediment and radionuclide transport in the Columbia River (Onishi, Y. 1977)

### Pacific Coast—General

**Maps:** Oblique map of the Pacific Coast of North America (Alpha, T. R. 1980)

### Pacific Coast—Geochemistry

**Isotopes:** Geochronology on Cascadia abyssal plain using high resolution gamma ray spectrometry (Cutshall, N. H. 1978)

— Regional variations in the lead isotopic characteristics of late Cenozoic basalts from the southwestern United States (Everson, J. E. 1979)

**Trace elements:** Geochemical studies of rocks, water, and gases at Mt. Hood, Oregon (Wollenberg, Harold A. 1979)

### Pacific Coast—Geochronology

**Holocene:** Bracketing dates for two ash falls from Mount Mazama (Mack, R. N. 1979)

— Comparison of relative age dating (RAD) data from eastern Sierra Nevada cirque deposits with those from the tephrochronologically age controlled deposits of the Wallowa Mountains, Oregon (Burke, R. M. 1978)

— Corrections for marine shell radiocarbon dates (Robinson, S. W. 1979)

**Quaternary:** Amino-acid racemization dating of Quaternary mollusks, Pacific Coast United States (Wehmiller, J. F. 1978)

— Role of thermal history uncertainties in amino-acid racemization age estimation of geological and archeological samples (Wehmiller, J. F. 1979)

### Pacific Coast—Geomorphology

**Maps:** Pictorial landform map; state of Washington and adjacent parts of Oregon, Idaho, and British Columbia (Molenaar, D. 1976)

**Symposia:** The fortieth annual meeting of the association of Pacific Coast Geographers (Anonymous. 1978)

**Weathering:** Comparison of relative age dating (RAD) data from eastern Sierra Nevada cirque deposits with those from the tephrochronologically age controlled deposits of the Wallowa Mountains, Oregon (Burke, R. M. 1978)

### Pacific Coast—Geophysical surveys

**Gravity surveys:** Gravity anomalies of Mt. Hood and the South central Cascade Range of Oregon (Couch, Richard W. 1979)

**Heat flow:** A multidisciplinary investigation of the Mt. Hood Volcano (Williams, D. L. 1979)

— Heat flow of the Mt. Hood Volcano, Oregon (Steele, John L. 1979)

— Heat flow of the Oregon Cascade Range (Blackwell, David D. 1979)

**Infrared surveys:** Structural and heat-flow implications of infrared anomalies at Mt. Hood, Oregon, 1972-1977 (Friedman, J. D. 1979)

**Magnetic surveys:** Regional tectonic and thermal model of the central Cascades, Oregon from magnetic data (Connard, G. 1979)

**Remote sensing:** An investigation of the utility of Landsat 2 MSS data to the fire-danger rating area, and forest fuel analysis with Crater Lake National Park, Oregon (Rabbi, H. A. 1979)

— Pacific Northwest Regional Commission (Hood, D. R. 1979)

— Pacific Northwest Resources Inventory Demonstration (Nichols, J. D. 1976)

— Tectonic analysis of SLAR mosaic of Northwest Cascade Range and adjacent lowlands, Washington (Lawrence, Robert D. 1978)

**Seismic surveys:** Seismic evidence for the structure and Cenozoic tectonics of the Pacific Coast States (Hill, D. P. 1978)

— Seismic studies at the Mt. Hood Volcano, northern Cascade Range, Oregon (Green, S. M. 1979)

— Upper crustal structure of the Mt. Hood, Oregon, region as revealed by time term analysis (Healy, J. H. 1979)

**Surveys:** Magnetotelluric and controlled-source electromagnetic studies at Mt. Hood, Oregon (Goldstein, N. E. 1979)

### Pacific Coast—Hydrogeology

**Ground water:** Ground-water levels in the United States, 1971-74; Northwestern States (U. S. Geological Survey. 1977)

**Hydrology:** Mechanics of the turbulent boundary layer over sand waves in the Columbia River (McLean, S. R. 1976)

## Pacific Coast

**Metamorphic rocks:** Geology and geochemistry of the Oregon Mountain area, southwestern Oregon and northern California (Vail, S. G. 1977)

**Metamorphism:** Tertiary evolution of Cordilleran metamorphic core complexes (Coney, P. J. 1979)

**Volcanology:** Composite cone growth modeled after Broken Top, a dissected high Cascade volcano (Crowe, B. 1977)

### Pacific Coast—Sedimentary petrology

**Sedimentation:** Beach profiles obtained with an amphibious DUKW on the Oregon and Washington coasts (Komar, P. D. 1977)

— Mesozoic forearc basin in central Oregon (Dickinson, W. R. 1979)

— Sedimentology of two progradational submarine-channel deposits on an active continental margin, Cretaceous, southwestern Oregon (Bourgeois, J. 1979)

### Pacific Coast—Seismology

**Crust:** Ophiolites, seismic velocities and oceanic crustal structure (Christensen, N. I. 1978)

— Seismic studies at the Mt. Hood Volcano, northern Cascade Range, Oregon (Green, S. M. 1979)

— Strain accumulation rates in the western United States between 1970 and 1978 (Prescott, W. H. 1979)

— Upper crustal structure of the Mt. Hood, Oregon, region as revealed by time term analysis (Healy, J. H. 1979)

**Earthquakes:** Attenuation patterns in the Pacific Northwest based on intensity data and the location of the 1872 North Cascades earthquake (Malone, S. D. 1979)

— Horizontal particle velocity and its relation to magnitude in the western United States (Espinosa, A. F. 1979)

**Seismicity:** A seismicity study of the Pacific Northwest region of the United States, November 1961 - August 1965 (Racine, D. 1979)

### Pacific Coast—Stratigraphy

**Cenozoic:** Cenozoic paleogeography of the western United States (Armentrout, J. M. 1979)

— Late Cenozoic marine invertebrates from Northwest California and Southwest Oregon (Roth, B. 1979)

— Molluscan paleoecology and biostratigraphy of Cenozoic deep-water facies in the Pacific Northwest (Hickman, C. S. 1977)

— Pacific Coast Cenozoic chronologic framework (Armentrout, J. M. 1979)

— The marine Cenozoic of the Pacific Coast states; an overview of the growth and development of biostatigraphic research (Addicott, W. O. 1979)

**Changes of level:** Late Pleistocene and Holocene zoogeography, Pacific Northwest coast (Kennedy, G. L. 1979)

## Pacific Coast

**Devonian:** Status of Devonian studies in western and Arctic North America (Johnson, J. G. 1977)

**Eocene:** Paleoecologic evaluation of late Eocene zonations of West Coast (McDougall, K. 1979)

— Paleogeological evaluation of late Eocene biostratigraphic zonations on the West Coast (McDougall, K. 1979)

**Mesozoic:** Mesozoic paleogeography of the western United States (Howell, D. G. 1978)

**Miocene:** The age of the "Pilot Rock Flora", Umatilla County, Oregon (Eelemendorf, J. 1978)

**Neogene:** Pacific Coast Neogene correlations; a progress report (Armentrout, J. M. 1979)

**Paleogene:** Late Eocene and Oligocene benthonic foraminiferal correlations between California and the Pacific Northwest (Tipton, A. 1977)

**Pleistocene:** Stratigraphy and land use of the post-Diamond Hill Paleosol, western Oregon (Parsons, R. B. 1979)

**Quaternary:** Direct marine-continental correlation; 150,000-year oxygen isotope-pollen record from the North Pacific (Heusser, L. E. 1979)

— Use of Neoglobularina pachyderma (Ehrenberg) coiling ratio curves for chronostratigraphic correlations of Quaternary marine sediments along the West Coast (Kilbourne, R. T. 1979)

**Tertiary:** Correlation of benthic and planktic microfossil chronologies of the Pacific Coast (Poore, R. Z. 1979)

— Paleomagnetism of the middle Tertiary Clarno Formation, North-central Oregon; constraint on models for tectonic rotation (Beck, M. E., Jr. 1978)

— Significance of pectinids in Tertiary biochronology of the Pacific Northwest states (Addicott, W. O. 1977)

### Pacific Coast—Structural geology

**Geosynclines:** Mesozoic construction of the Cordilleran "collage", central British Columbia to central California (Davis, G. A. 1978)

**Neotectonics:** Late Cenozoic tectonic evolution of the western United States (Livaccari, R. F. 1979)

**Tectonics:** A tectonic model for evolution of the Cascade Range (Hammond, Paul E. 1979)

— Cordilleran tectonic profiles, western USA (Maxwell, J. C. 1979)

— Evolution of the Eocene continental margin of western Oregon and Washington (Snavely, P. D., Jr. 1977)

### Pacific Coast—Tectonophysics

**Crust:** Heat flow of the Oregon Cascade Range (Blackwell, David D. 1979)

— Regional tectonic and thermal model of the central Cascades, Oregon from magnetic data (Connard, G. 1979)

— Seismic evidence for the structure and Cenozoic tectonics of the Pacific Coast States (Hill, D. P. 1978)

**Heat flow:** Regional magnetic variation profiling using the method of derivatives (Faynberg, E. B. 1976)

**Isostasy:** Compensation of oceanic topography; an application of the response function technique to the Surveyor area (McNutt, M. 1979)

**Mantle:** Regional magnetic variation profiling using the method of derivatives (Faynberg, E. B. 1976)

**Maps:** Base map for geoscience studies of the Juan de Fuca Plate; progress report (Rogers, G. C. 1978)

— Tectono-stratigraphic terrane map of western Baja California, western California, and Southwest Oregon (Blake, M. C., Jr. 1979)

**Plate tectonics:** An Eocene hotspot in the Pacific Northwest? (Duncan, R. A. 1977)

— Cenozoic plate tectonic setting of the Cordilleran region in the United States (Dickinson, W. R. 1979)

— Crustal structure near the Juan de Fuca and Explorer plate boundary from seismic refraction data (Au, D. 1979)

— Development of spaced cleavage in deep-sea mudstone; an initial response to subduction (Berglund, P. L. 1978)

— Early Tertiary rifting in western Oregon-Washington (McWilliams, R. G. 1978)

— Emplacement of ultramafic rocks and metamorphism in the Marble Mountains area of the Klamath Mountains (Welsh, J. L. 1978)

— Geologic cross section of the central Oregon continental margin (Snavely, P. D., Jr. 1980)

— Geology and geochemistry of the Oregon Mountain area, southwestern Oregon and northern California (Vail, S. G. 1977)

— Has the North Pacific spreading center been subducted beneath Oregon, Washington and British Columbia? (Farrar, E. 1979)

— Interpretation of the Cenozoic geologic history, central Oregon continental margin; cross-section summary (Snavely, P. D., Jr. 1980)

— Intracontinental plate boundary east of Cape Mendocino, California (Dott, R. H., Jr. 1979)

— Jurassic ophiolitic rocks in the Klamath Mountains, S.W. Oregon and implications for pre-Nevadan paleogeography (Vail, Scott G. 1977)

— Late Mesozoic tectonic history of northern California and southwestern Oregon (Jones, D. L. 1978)

— Mesozoic construction of Cordilleran "collage," central British Columbia to central California (Davis, G. A. 1978)

— Mesozoic paleogeography and paleotectonics, Suplee-Izze and Aldrich Mountains inlier, central Oregon (Dickinson, W. R. 1978)

— Microplate tectonics of Alaska; significance for the Mesozoic history of the Pacific Coast of North America (Jones, D. L. 1978)

— Paleogene tectonic evolution of the North American Cordillera from 40° to 56° north (Ewing, T. E. 1979)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Plate tectonics of the western United States (Hamilton, W. B. 1979)

— Preliminary paleomagnetic results from the southern Cascade Range of southwestern Washington (Bates, R. G. 1979)

— Ridge subduction, eduction, and the mechanism of uplift blueschists (Dixon, J. M. 1978)

— Rotations in Oregon (Cox, A. 1979)

— Sonobuoy array measurements of active faulting on the Gorda Ridge (Jones, P. R. 1978)

— Subduction, accretion, and batholith emplacement (Gastil, R. G. 1978)

— Tectonic rotation of Oligocene intrusive rocks in the Coast Range of Oregon; a constant rate of rotation for the period 50-30 m.y. B.P. (Plumley, P. W. 1977)

— Tectonic rotation of the Oregon Coast Range (Cox, A. 1977)

— Tectono-stratigraphic terrane map of western Baja California, western California, and Southwest Oregon (Blake, M. C., Jr. 1979)

— Trace elements in continental-margin magmatism; Part I, Trace elements in the Clarno Formation of central Oregon and the nature of the continental margin on which eruption occurred (Rogers, J. J. W. 1980)

### Pacific region—Stratigraphy

**Neogene:** The Paleogene-Neogene boundary in eastern North Pacific marine sequences (Addicott, W. O. 1979)

### Pacific region—Structural geology

**Isostasy:** Isostasy and petrogenesis (Abramovich, I. I. 1977)

**Tectonics:** Cordilleran tectonic profiles, western USA (Maxwell, J. C. 1979)

### Pacific region—Tectonophysics

**Mantle:** Regional magnetic variation profiling using the method of derivatives (Faynberg, E. B. 1976)

**Plate tectonics:** Base map for geoscience studies of the Juan de Fuca Plate; progress report (Rogers, G. C. 1978)

— Cenozoic plate convergence in the vicinity of the Pacific Northwest; a synthesis and assessment of plate tectonics in the northeastern Pacific (Carlson, R. L. 1976)

## Paleoecology

### Paleobotany

**Algae:** Effects of micro-nutrients and major nutrients on the growth and species composition of natural phytoplankton populations (Frey, B. E. 1977)

— The distribution of estuarine diatoms along environmental gradients; a canonical correlation (McIntire, C. D. 1978)

**Angiosperms:** An extinct *Evodia* wood from Oregon (Gregory, I. 1976)

— Atlas of fossil fruits and seeds from North central Oregon (Bones, T. J. 1979)

— Flavonoid and other chemical constituents of fossil *Celtis* and *Ulmus* (Succor Creek flora) (Giannasi, D. E. 1977)

— Flavonoids and other chemical constituents of fossil *Zelkova* (*Ulmaceae*) (Niklas, K. J. 1977)

— Wood of *Tapirira* (*Anacardiaceae*) from the Paleogene Clarno Formation of Oregon (Manchester, S. R. 1977)

**Plantae:** Description and classification of the forests of the upper Illinois River drainage of southwestern Oregon (Atzet, T. 1979)

— Field trip; Succor Creek fossils (Douglas, D. 1979)

— The picture wood at Belveal Farm (McMackin, C. E. 1978)

**Paleocene** see also under Stratigraphy

### Paleoclimatology—Holocene

**West:** The Altithermal as an archaeological "non-problem" in the Great Basin (Weide, D. L. 1976)

### Paleoclimatology—Miocene

**Regional:** Diagenetic alteration and formation of authigenic minerals in the Miocene "Rome Beds", Southeast Oregon (Campion, K. M. 1979)

### Paleoclimatology—Pleistocene

**Pacific Coast:** Late Pleistocene and Holocene zoogeography, Pacific Northwest coast (Kennedy, G. L. 1979)

**Pacific Ocean:** Radiolarian-planktonic foraminifera ratios and Pleistocene deep-sea stratigraphy in the northeastern Pacific off Oregon and Washington (Fowler, G. A. 1977)

### Paleoclimatology—Pliocene

**North America:** Middle Pliocene temperature implications based on the Bryozoa Hippothoa (*Cheiostomata-Ascophora*) (Morriss, P. A. 1976)

### Paleoclimatology—Quaternary

**Pacific Coast:** Direct marine-continental correlation; 150,000-year oxygen isotope-pollen record from the North Pacific (Heusser, L. E. 1979)

**Regional:** The Warner Valley, Oregon; a test of pluvial climatic conditions (Weide, D. L. 1976)

### Paleoecology—Coelenterata

**Triassic:** Paleoecology, structure, and distribution of Triassic coral buildups in western North America (Stanley, G. D., Jr. 1979)

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### Paleoecology—Eocene

*Pacific Coast:* Paleoecological evaluation of late Eocene biostratigraphic zonations on the West Coast (McDougall, K. 1979)

### Paleoecology—Foraminifera

*Eocene:* Late Eocene foraminiferal biostratigraphy and paleoecology of northwestern Oregon (McDougall, K. 1977)

— Paleoecological evaluation of late Eocene zonations of West Coast (McDougall, K. 1979)

### Paleoecology—Holocene

*Great Basin:* Great Basin plant communities; pristine and grazed (Young, J. A. 1976)

### Paleoecology—Interpretation

*Communities:* Identification and interpretation of communities at the generic level (Parrish, J. T. 1978)

### Paleoecology—Invertebrates

*Cenozoic:* Late Cenozoic marine invertebrates from Northwest California and Southwest Oregon (Roth, B. 1979)

### Paleoecology—Mollusca

*Cenozoic:* Cenozoic molluscan stages of Oregon and Washington (Armentrout, J. M. 1977)

— Molluscan paleoecology and biostratigraphy of Cenozoic deep-water facies in the Pacific Northwest (Hickman, C. S. 1977)

*Miocene:* New Miocene formation at Coos Bay, Oregon (Armentrout, J. M. 1978)

*Pleistocene:* Community succession of Pioneer Terrace molluscan fauna, Cape Blanco, Oregon (Armentrout, J. M. 1978)

*Tertiary:* Bathyal gastropods of the family Turridae in the early Oligocene Keasey Formation in Oregon, with a review of some deep-water genera in the Paleogene of the eastern Pacific (Hickman, C. S. 1976)

— Significance of pectinids in Tertiary biochronology of the Pacific Northwest states (Addicot, W. O. 1977)

### Paleoecology—Plantae

*Quaternary:* Description and classification of the forests of the upper Illinois River drainage of southwestern Oregon (Atzet, T. 1979)

### Paleoecology—Quaternary

*Pacific Coast:* Direct marine-continental correlation; 150,000-year oxygen isotope-pollen record from the North Pacific (Heusser, L. E. 1979)

### Paleoecology—Triassic

*North America:* Triassic coral build-ups of western North America (Stanley, G. D., Jr. 1977)

### Paleoecology—Trilobita

*Cambrian:* Middle Cambrian trilobite biostratigraphy of the Great Basin (Robison, R. A. 1976)

### Paleoecology—Vertebrates

*Quaternary:* Mount Mazama, climatic change, and Fort Rock Basin archaeofaunas (Grayson, D. K. 1979)

**Paleogene** see also under Stratigraphy; see also under Stratigraphy under Pacific Coast

### Paleogeography—Cambrian

*Western U.S.:* Cambrian and latest Precambrian paleogeography and tectonics in the western United States (Stewart, J. H. 1977)

### Paleogeography—Cenozoic

*Pacific Coast:* A tectonic model for evolution of the Cascade Range (Hammond, Paul E. 1979)

— Cenozoic paleogeography of the western United States (Armentrout, J. M. 1979)

— Cenozoic plate tectonic setting of the Cordilleran region in the United States (Dickinson, W. R. 1979)

— Pacific Coast Cenozoic chrono-logic framework (Armentrout, J. M. 1979)

— The marine Cenozoic of the Pacific Coast states; an overview of the growth and development of biostratigraphic research (Addicot, W. O. 1979)

### Paleogeography—Devonian

*North America:* Status of Devonian studies in western and Arctic North America (Johnson, J. G. 1977)

*Western U.S.:* Silurian and Devonian paleogeography of the western United States (Poole, F. G. 1977)

### Paleogeography—Eocene

*Regional:* Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetism of the middle Tertiary Clarno Formation, North-central Oregon; constraint on models for tectonic rotation (Beck, M. E., Jr. 1978)

— Tectonic rotation of Eocene volcanic rocks in the Coast Range of Oregon (Cox, A. 1976)

— Tectonic rotation of middle Eocene sediments in the Coast Range of Oregon (Simpson, R. W., Jr. 1976)

— Tectonic rotation of the Oregon Coast Range (Cox, A. 1977)

— Tectonic rotation of the Oregon Coast Range, northwestern United States (Simpson, R. W., Jr. 1977)

### Paleogeography—Mesozoic

*Regional:* Paleogeographic and paleotectonic implications of Mesozoic stratigraphy and structure in the John Day inlier of central Oregon (Dickinson, W. R. 1978)

*Western U.S.:* Mesozoic paleogeography of the western United States (Howell, D. G. 1978)

### Paleogeography—Mississippian

*Western U.S.:* Mississippian paleogeography and tectonics of the western United States (Poole, F. G. 1977)

### Paleogeography—Neogene

*Western U.S.:* Neogene paleogeography of the western United States (Cole, M. R. 1979)

### Paleogeography—Ordovician

*Western U.S.:* Ordovician paleogeography of the western United States (Ross, R. J., Jr. 1977)

### Paleogeography—Paleozoic

*California:* Review of Paleozoic rocks of the Klamath Mountains (Irwin, W. P. 1977)

*Idaho:* Paleozoic rocks of eastern Oregon and western Idaho (Vallier, T. L. 1977)

*Regional:* Paleozoic rocks of eastern Oregon and western Idaho (Vallier, T. L. 1977)

### Paleogeography—Pennsylvanian

*Western U.S.:* Pennsylvanian paleogeographic patterns in the western United States (Rich, M. 1977)

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### Paleogeography—Permian

*Western U.S.:* Permian depositional provinces and tectonics, western United States (Stevens, C. H. 1977)

### Paleogeography—Silurian

*Western U.S.:* Silurian and Devonian paleogeography of the western United States (Poole, F. G. 1977)

### Paleomagnetism—Cretaceous

*USSR:* Stratigraphy and paleomagnetic characteristics of the Upper Jurassic and Lower Cretaceous deposits of Stolbovoi Island, Novosibirsk Archipelago (Ivanov, V. V. 1977)

### Paleomagnetism—Eocene

*Regional:* Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetism of the middle Tertiary Clarno Formation, North-central Oregon; constraint on models for tectonic rotation (Beck, M. E., Jr. 1978)

— Tectonic rotation of Eocene volcanic rocks in the Coast Range of Oregon (Cox, A. 1976)

— Tectonic rotation of the Oregon Coast Range (Cox, A. 1977)

### Paleomagnetism—Interpretation

*Crust:* Metallic mineralogy of serpentines; implications for deep crustal magnetic anomalies (Leavell, D. N. 1978)

*Rotation:* Paleomagnetic evidence for structural rotation in the Pacific Northwest (Basham, W. L. 1978)

### Paleomagnetism—Jurassic

*USSR:* Stratigraphy and paleomagnetic characteristics of the Upper Jurassic and Lower Cretaceous deposits of Stolbovoi Island, Novosibirsk Archipelago (Ivanov, V. V. 1977)

### Paleomagnetism—Mesozoic

*Regional:* Paleomagnetic evidence for the rotation of Jurassic plutons in eastern Oregon (Wilson, D. 1979)

*Western U.S.:* Paleomagnetic evidence for clockwise rotation in western Idaho, eastern Oregon, and northern Nevada (Basham, W. L. 1978)

### Paleomagnetism—Miocene

*Columbia Plateau:* Magnetostratigraphy and correlation of Miocene basalts of the northern Oregon coast and Columbia Plateau, Southeast Washington (Choiniere, S. R. 1979)

— Magnetostratigraphy of the Imnaha and Grande Ronde basalts in the southeast part of the Columbia Plateau (Hooper, P. R. 1979)

*Pacific Coast:* Paleomagnetic correlation and magnetostratigraphy of Miocene basalts of the Oregon coast and Columbia Plateau (Choiniere, S. R. 1976)

*Regional:* Stratigraphic resolution of ambiguities in the interpretation of unusual paleomagnetic directions in Miocene basalts of the Oregon coast (Choiniere, S. R. 1976)

— Tectonic significance of the paleomagnetism of the Frenchman Springs Basalt, Oregon and Washington (Kienle, Clive F., Jr. 1978)

### Paleomagnetism—Neogene

*Regional:* Picture Gorge Basalt coeval with middle part of Grande Ronde Basalt (Swanson, D. A. 1978)

— Stratigraphy, structure, and petrology of Columbia River Basalt in a portion of the Grande Ronde River - Blue Mountains area of Oregon and Washington (Ross, M. E. 1978)

### Paleomagnetism—Oligocene

*Regional:* Tectonic rotation of Oligocene intrusive rocks in the Coast Range of Oregon; a constant rate of rotation for the period 50-30 m.y. B.P. (Plumley, P. W. 1977)

### Paleomagnetism—Paleogene

*Washington:* Preliminary paleomagnetic results from the southern Cascade Range of southwestern Washington (Bates, R. G. 1979)

### Paleomagnetism—Pole positions

*Polar wandering:* Microcontinental tectonics in the western North American Cordillera (Beck, M. E., Jr. 1977)

### Paleomagnetism—Tertiary

*Regional:* Palaeomagnetic record of a late Tertiary field reversal (Dodson, R. 1978)

— Paleomagnetism of basalt flows, North central Deschutes-Umatilla Plateau, Oregon (Faroqui, S. M. 1976)

— Rotations in Oregon (Cox, A. 1979)

*Washington:* Palaeomagnetic record of a late Tertiary field reversal (Dodson, R. 1978)

### Paleontology

*Amphibia:* A new species of Taricha (Caudata; Salamandridae), from the Oligocene John Day Formation of Oregon (Naylor, B. G. 1979)

*Foraminifera:* An Eocene foraminiferal fauna from Bandon, Oregon (Link, R. L. 1976)

*General:* Fossils in Oregon; a collection of reprints from the Ore Bin (Steere, M. L. 1977)

*Mammalia:* A new late Hemingfordian mammal fauna from the John Day Formation, Oregon, and its stratigraphic implications (Woodburne, M. O. 1977)

— Hemphillian rodents from northern Oregon and their rela-

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- tionships to other rodent faunas in North America (Martin, J. E. 1979)
- Horse genealogy; the Oregon connection (Drake, E. T. 1978)
- Miocene dome-skulled chalicotheres (*Mammalia, Perissodactyla*) from the western United States; a preliminary discussion of a bizarre structure (Munthe, J. 1979)
- Reevaluation of early Miocene North American *Moropus* (*Perissodactyla, Chalicotheriidae, Schizotheriinae*) (Coombs, M. C. 1978)
- *Vulpes macrotis* (McGrew, J. C. 1979)
- Mollusca:** Bathyal gastropods of the family *Turridae* in the early Oligocene Keasey Formation in Oregon, with a review of some deep-water genera in the Paleogene of the eastern Pacific (Hickman, C. S. 1976)
- Big Seffy (Stafford, W. L. 1979)
- Community succession of Pioneer Terrace molluscan fauna, Cape Blanco, Oregon (Armentrout, J. M. 1978)
- First occurrence, systematics, and functional morphology of *Nipponites* (Cretaceous Lytoceratina) from the Americas (Ward, P. D. 1977)
- Marine fossils on Oregon beaches (Heflin, E. 1979)
- Pleurotomaria (Archaeogastropoda) in the Eocene of the northeastern Pacific; a review of Cenozoic biogeography and ecology of the genus (Hickman, C. S. 1976)
- Reptilia:** A new amphisbaenian (*Reptilia; Amphisbaenia*) from the Oligocene-Miocene John Day Formation, Oregon (Bertram, D. S. 1976)
- Jurassic marine crocodilians (*Mesosuchia, Teleosauridae*) from central Oregon; first record in North America (Buffetaut, E. 1979)
- Paleozoic** see also under Stratigraphy
- Palynomorphs—Biostratigraphy**
- Quaternary:** Direct marine-continental correlation; 150,000-year oxygen isotope-pollen record from the North Pacific (Heusser, L. E. 1979)
- Pollen influx and volcanic ash (Mehringer, P. J., Jr. 1977)
- Palynomorphs—Miospores**
- Holocene:** Pollen influx and the deposition of Mazama and Glacier Peak tephra (Blinman, E. 1979)
- Paragenesis—Gold**
- Regional:** Paragenesis and geochemistry of the Granite gold district, Grant County, Oregon (Young, James Stanton. 1979)
- Paragenesis of gold veins in the Granite District, Grant County, Oregon (Young, J. Stanton. 1979)
- Pelecypoda** see Bivalvia under Mollusca
- Pennsylvanian** see also under Stratigraphy under Western U.S.

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- Periglacial features** see under Glacial geology
- Permian** see also under Stratigraphy; see also under Stratigraphy under Western U.S.
- Petroleum** see also under Economic geology; see also under Economic geology under Pacific Coast
- Petrology**
- Igneous rocks:** Application of pyroxene and olivine-spinel geothermometers to the alpine peridotites in southwestern Oregon (Henry, D. J. 1976)
- Basalt geology of eastern Oregon (Farooqui, Shannon and Wilson. 1978)
- Basalts of Oregon (U.S.A.) and their geotectonic environment; I, Petrochemistry of Tertiary basalts of the Oregon Coast Range (Loeschke, J. 1979)
- Chemistry, petrography, and stratigraphy of the Columbia River Group in the Imnaha River valley region, eastern Oregon and western Idaho (Kleck, W. D. 1976)
- Climactic eruption of Crater Lake, Oregon; evidence for crystal fractionation in a water-undersaturated magma (Ritchey, J. L. 1979)
- Climactic eruptions of Crater Lake; evidence for an early stage of mixing within a pluton (Eichelberger, J. C. 1978)
- Complementary meta-gabbros and peridotites in the northern Klamath Mountains, U.S.A. (Kays, M. A. 1977)
- Composition and differentiation of the Imnaha Basalt, Columbia River Group (Hooper, P. R. 1976)
- Compositional layering in alpine peridotites; evidence for pressure solution creep in the mantle (Dick, H. J. B. 1979)
- Evidence of partial melting in the Josephine Peridotite (Dick, H. J. B. 1977)
- Formation of small dunite bodies from harzburgite by metasomatic transformation in the Canyon Mountain ophiolite, Oregon (Dungan, M. A. 1976)
- Geochemical data on Columbia River Basalt stratigraphy in western Oregon (Beeson, Marvin H. 1976)
- Geology and petrology of the Strawberry Volcanics, NE Oregon (Robyn, T. L. 1977)
- Geology of a volcanic complex on the south flank of Mt. Jefferson, Oregon (Gannon, Brian L. 1977)
- Geology of the gabbroic complex along the northern border of the Josephine Peridotite, Vulcan Peak area, southwestern Oregon (Loney, R. A. 1977)
- Geology of the Quartzburg mining district, Grant County, Oregon (Johnson, F. R. 1975)
- Late Cenozoic ash-flow tuffs and their vents, eastern Oregon (Walker, G. W. 1976)
- Major element geochemistry and origin of albite granite near Sparta, Oregon (Almy, R. 1978)
- Morphologic parameters of Mount Mazama and Glacier Peak tephras; a scanning-electron microscope study (Tucker, G. B. 1977)
- Near vent characteristics of the Dinner Creek ash-flow tuff, eastern Oregon (Wood, John D. 1976)
- Nepheline syenite, STM-1, from Table Mountain, Oregon (Snavely, P. D., Jr. 1976)
- Non-subduction related late-Miocene calc-alkaline volcanic activity in NE Oregon (Robyn, T. L. 1977)
- Ophiolitic terranes of California, Oregon, and Nevada (Irwin, W. P. 1977)
- Oregon's incredible Glass Buttes (Heflin, E. 1979)
- Origin of a continental calc-alkaline volcanic suite, NE Oregon (Robyn, T. L. 1977)
- Origin of albite granites near Sparta, northeastern Oregon (Phelps, D. W. 1977)
- Partial melting in the Josephine Peridotite; I. The effect on mineral composition and its consequence for geobarometry and geothermometry (Dick, H. J. B. 1977)
- Petrogenesis of Picture Gorge basalts; a preliminary report (Goles, G. G. 1976)
- Petrology and initial tectonic setting of Permian and Triassic volcanic rocks, northeastern Oregon and western Idaho (Batiaga, R. 1976)
- Preliminary correlation of lower Yakima Basalt flows in western Oregon with the type area in central Washington (Beeson, Marvin H. 1976)
- Quartz latite (dellenite), QLO-1, from southeastern Oregon (Walker, G. W. 1976)
- Rogue River island arc complex, western Jurassic belt, Klamath Mountains, Oregon (Garcia, M. O. 1976)
- Some quantitative aspects of orogenic volcanism in the Oregon Cascades (White, Craig M. 1978)
- Source directions of pumice and ash deposits near Bend, Oregon (Mimura, K. 1978)
- Structural implications of the Yakima Basalt in North central Oregon and South central Washington (Farooqui, S. M. 1976)
- Studies of phase relations in subalkaline volcanic rock series (Osborn, E. F. 1977)
- Tephra layer from boreholes in Columbia Basin alluvium (Beeson, Marvin H. 1978)
- The Canyon Mountain Complex, Oregon, and some problems of ophiolites (Thayer, T. P. 1977)
- The Clarno Formation; a record of early Tertiary volcanism in central Oregon (Taylor, Edward M. 1977)
- The Clarno Formation of central Oregon, U.S.A.; volcanism on a thin continental margin (Rogers, J. J. W. 1977)
- The Josephine Complex; an ophiolite in Southwest Oregon (Vail, Scott G. 1976)
- The origin and emplacement of the Josephine Peridotite of southwestern Oregon (Dick, H. J. B. 1976)
- The origin of the Miocene basalts of coastal Oregon and Washington; an alternative hypothesis (Beeson, Marvin H. 1979)
- Volcanism and mineralization of the McDermitt Caldera, Nevada-Oregon (Rytuba, J. J. 1976)
- Intrusions:** Amphibole stability in a differentiated calc-alkaline magma chamber; an experimental investigation (Ritchey, J. L. 1978)
- Evolution of composite volcanoes; the role of dike and sill emplacement within the volcanic edifice (Crowe, B. 1978)
- Gently dipping feeder dikes for Columbia River Basalt Group (Swanson, D. A. 1978)
- Geology, petrology, and mineralization of the Paisley Mountains plutonic complex, Lake County, Oregon (Hammitt, J. W. 1976)
- Hornblendite and related rocks from the contact zone of a hornblendite diorite pluton in Southwest Oregon; a geochemical and petrographic study (Eldridge, C. Stewart. 1977)
- Lava:** Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)
- Rhyolitic volcanism in southeastern Oregon and the Snake River plain, Idaho; similarities and contrasts (Walker, G. W. 1977)
- Magmas:** Crystal clots, amphibole fractionation and the evolution of calc-alkaline magmas (Garcia, M. O. 1979)
- Evidence of partial melting and fractional crystallization of Columbia River Basalt magmas, Oregon and Washington (Ross, M. E. 1979)
- Inferred depths of origin of High Cascade magmas (Goles, G. G. 1977)
- Magmatic evolution of the central Oregon Cascades (McBirney, A. R. 1976)
- Origin of divergent magmas at Crater Lake, Oregon (Ritchey, J. L. 1979)
- Viscosities of basalt and andesite melts at high pressures (Kushiro, I. 1976)
- Viscosity of basalt and andesite magmas at high pressures (Kushiro, I. 1976)
- Maps:** Ophiolitic terranes of part of the western United States (Irwin, W. P. 1979)
- Preliminary geologic map of the metavolcanic rocks in part of the Canyonville, Days Creek, and Glendale quadrangles, Oregon (Johnson, M. G. 1979)
- Metamorphic rocks:** Alkalic pilowed greenstone, Greenhorn Mountains, Northeast Oregon (Mullen, E. D. 1979)

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- Mesozoic metavolcanic sequences in the northern Klamath Mountains, southwestern Oregon (Johnson, M. G. 1977)
- Petrogenesis of spilite and keratophyre from a Permian and Triassic volcanic arc terrane, eastern Oregon and western Idaho, U.S.A. (Vallier, T. L. 1978)
- Petrographic and structural reconnaissance of the Franciscan Complex (Dothan/Otter Point) in the Dillard Block, Southwest Oregon (Worley, P. L. H. 1978)
- Petrology of the Rogue River area, Klamath Mountains, Oregon; problems in the identification of ancient volcanic arcs (Garcia, M. O. 1976)
- The amphibolite of Briggs Creek; a tectonic slice of metamorphosed oceanic crust in southwestern Oregon? (Coleman, R. G. 1976)

**Metamorphism:** Contrasting metamorphic terrains of Siskiyou Mountains, Oregon-California (Ferns, M. L. 1978)

— Textural banding in igneous rocks; an example from southwestern Oregon (Jorgenson, D. B. 1979)

**Metasomatic rocks:** Metallic mineralogy of serpentinites; implications for deep crustal magnetic anomalies (Leavell, D. N. 1978)

**Metasomatism:** Formation of small dunite bodies by metasomatic transformation of harzburgite in the Canyon Mountain Ophiolite, Northeast Oregon (Dungan, M. A. 1977)

— Zeolite-clay mineral zonation of volcanoclastic sediments within the McDermit Caldera complex of Nevada and Oregon (Glazman, R. K. 1979)

**Volcanic rocks:** Basalts of Oregon (U.S.A.) and their geotectonic environment; II, Petrochemistry of Tertiary and Quaternary basalts and andesites of the Western and High Cascades (Loeschke, J. 1979)

**Volcanism:** Mount Mazama, climatic change, and Fort Rock Basin archaeofaunas (Grayson, D. K. 1979)

— Petrology of the Rogue River area, Klamath Mountains, Oregon; problems in the identification of ancient volcanic arcs (Garcia, M. O. 1976)

— Pollen influx and the deposition of Mazama and Glacier Peak tephra (Blinman, E. 1979)

— The geology of the Castle Rock area, Grant, Harney and Malheur counties, Oregon (Wood, John D. 1976)

**Volcanology:** Cenozoic volcanism in the Cascade Range, Medford 2° sheet, southern Oregon (Smith, J. G. 1979)

— Duration and volume of Columbia River Basalt volcanism, Washington, Oregon, and Idaho (McKee, E. H. 1977)

— Miocene volcanism in eastern Oregon; an example of calc-alkaline volcanism unrelated to subduction (Robyn, T. L. 1979)

— Petrology and evolution of Mount Mazama (Crater Lake); a geochemical study (Leeman, W. P. 1979)

— Some quantitative aspects of orogenic volcanism in the Oregon Cascades (McBirney, A. R. 1977)

— The John Day Formation of Oregon; a record of early Cascade volcanism (Robinson, P. T. 1979)

### Phase equilibria—Chain silicates, amphibole group

**Amphibole:** Amphibole stability in a differentiated calc-alkaline magma chamber; an experimental investigation (Ritchey, J. L. 1978)

### Phase equilibria—Experimental studies

*Fe-Ni-S:* Origin and mineral chemistry of "josephinite" (Thornber, C. R. 1976)

### Phase equilibria—Lava

**Melting:** Mineralogy and petrogenesis of the Yapoah basaltic andesite, McKenzie Pass area, central Oregon (Green, N. L. 1978)

### Phase equilibria—Magmas

**Experimental studies:** Origin of divergent magmas at Crater Lake, Oregon (Ritchey, J. L. 1979)

**P-T conditions:** Vapor exsolution in andesitic and bimodal volcanism and an estimate of depth to magma (Eichelberger, J. C. 1979)

### Phase equilibria—Native elements and alloys

**Interpretation:** Geology, petrography and origin of josephinite (Weathers, M. S. 1976)

### Phase equilibria—Silicates

**Melts:** Studies of phase relations in subalkaline volcanic rock series (Osborn, E. F. 1977)

### Phosphorus—Geochemistry

**Sediments:** Sediment characteristics and the trophic status of four Oregon lakes (Davis, G. E. 1976)

### Placers—Gold

**Regional:** A geological field trip guide from Sweet Home, Oregon, to the Quartzville mining district (Gray, Jerry J. 1977)

### Placers—Heavy minerals

**Pacific Coast:** Heavy minerals and bedrock minerals on the continental shelf off Washington, Oregon and California (Phillips, R. L. 1979)

**Plantae see also Algae; Angiosperms; Palynomorphs**

### Plantae—Biogeography

**Holocene:** The ecological biogeography of an Oregon coastal salt marsh (Eilers, H. P. 1976)

### Plantae—Ecology

**Communities:** Description and classification of the forests of the upper Illinois River drainage of southwestern Oregon (Atzet, T. 1979)

### Plantae—Floral studies

**Fossil wood:** The picture wood at Belvoir Farm (McMackin, C. E. 1978)

**Leaves:** Field trip; Succor Creek fossils (Douglas, D. 1979)

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### Plantae—Occurrence

**Fossil wood:** Beach treasures of Whiskey Run (Heflin, E. 1979)

**Plate tectonics** *see also under Tectonophysics; see also under Tectonophysics under Pacific Coast; Pacific region; Western U.S.*

**Pleistocene** *see also under Stratigraphy; see also under Stratigraphy under Pacific Coast*

### Pleistocene—Stratigraphy

**Biostratigraphy:** Radiolarian ratios and Pleistocene-Holocene boundary (McMillen, K. J. 1979)

**Pliocene** *see also under Stratigraphy*

**Plutons** *see under Intrusions*

**Pollution** *see also under Environmental geology; see also under Environmental geology under Pacific Coast; Western U.S.*

**Polymetallic ores** *see also under Economic geology*

**Pumice** *see also under Pyroclastics and glasses under Igneous rocks*

**Quaternary** *see also under Stratigraphy; see also under Geochronology under Pacific Coast; see also under Stratigraphy under Pacific Coast*

### Quaternary—Stratigraphy

**Biostratigraphy:** Radiolarian ratios and Pleistocene-Holocene boundary (McMillen, K. J. 1979)

**Radioactive dating** *see Absolute age*

### Radiolaria—Biostratigraphy

**Eocene:** Biostratigraphy of the Texaco Clark and Wilson No. 6-1 Well, Columbia County, Oregon (McKeel, Daniel R. 1979)

— Holothurian microfossils and Eocene stratigraphy of Southwest Oregon (Orr, W. N. 1978)

**Mesozoic:** Radiolarians from Mesozoic rocks in western Oregon (Blair, W. N. 1978)

— Radiolarians from pre-Nevadan rocks of the Klamath Mountains, California and Oregon (Irwin, W. P. 1978)

**Paleozoic:** Radiolarian age-dating of Paleozoic cherts (Jones, D. L. 1978)

**Pleistocene:** Radiolarian-planktonic foraminifera ratios and Pleistocene deep-sea stratigraphy in the northeastern Pacific off Oregon and Washington (Fowler, G. A. 1977)

— Radiolarian ratios and Pleistocene-Holocene boundary (McMillen, K. J. 1979)

**Triassic:** Upper Triassic (Norian) radiolarian biostratigraphy in western North America (Blome, C. D. 1978)

— Upper Triassic Radiolaria from eastern Oregon and Queen Charlotte Islands, British Columbia (Blome, C. D. 1979)

### Radium—Isotopes

**Ra-226:** Geochronology on Cascadia abyssal plain using high resolution gamma ray spectrometry (Cutshall, N. H. 1978)

### Rare earths *see also Yttrium*

### Rare earths—Abundance

**Igneous rocks:** Jurassic ophiolitic rocks in the Klamath Mountains, S.W. Oregon and implications for pre-Nevadan paleogeography (Vail, Scott G. 1977)

**Keratophyre:** Petrology and geochemistry of silicic rocks in the

Canyon Mountain ophiolite, northeastern Oregon (Gerlach, D. C. 1979)

**Metavolcanic rocks:** Petrology of the Rogue and Galice formations, Klamath Mountains, Oregon; identification of a Jurassic island arc sequence (Garcia, M. O. 1979)

**Peridotite:** Trace element abundances in josephinite and related rocks (Goettel, K. A. 1978)

**Reclamation** *see also under Environmental geology*

**regional geology** *see areal geology under the appropriate area term*

**Remote sensing** *see also Geophysical methods; Geophysical surveys; see also under Geophysical surveys under Basin and Range Province; Pacific Coast*

### Remote sensing—Applications

**Hydrogeology:** Use of earth satellites for automation of hydrologic data collection (Paulson, R. W. 1978)

**Land use:** Land use analysis in unurbanized areas (Jensen, J. R. 1979)

### Remote sensing—Imagery

**Skylab:** Skylab 4 observations of volcanoes; Part A, Volcanoes and volcanic landforms (Friedman, J. D. 1977)

### Remote sensing—Interpretation

**Multispectral analysis:** Visible and near-infrared spectra of rocks from chromium-rich areas (Hunt, G. R. 1979)

### Reptilia—Archosauria

**Jurassic:** Jurassic marine crocodilians (Mesosuchia, Teleosauridae) from central Oregon; first record in North America (Buffetaut, E. 1979)

### Reptilia—Lepidosauria

**Tertiary:** A new amphisbaenian (Reptilia; Amphisbaenia) from the Oligocene-Miocene John Day Formation, Oregon (Bertram, D. S. 1976)

**Reservoirs** *see also under Engineering geology*

**Rhyolite** *see under Andesite-rhyolite family under Igneous rocks; see under Volcanic rocks under Igneous rocks*

### Ring silicates *see under Minerals*

### Rock mechanics *see also Soil mechanics*

### Rock mechanics—Failure

**Slope stability:** Monitoring of the performance of rock slopes as related to design considerations (John, K. W. 1977)

### Rock mechanics—Materials, properties

**Elastic properties:** Ophiolites, seismic velocities and oceanic crustal structure (Christensen, N. I. 1978)

**Fragmentations:** Slaking basalts (Higgs, N. B. 1976)

**Stress:** Causes of degradation in basaltic aggregates and durability testing (Van Atta, Robert O. 1976)

### Rocky Mountains—Petrology

**Igneous rocks:** Interrelations of lower Tertiary volcanic fields in northwestern interior United States (Prostka, H. J. 1977)

## Rocky Mountains

### Rocky Mountains—Stratigraphy

*Tertiary:* Interrelations of lower Tertiary volcanic fields in northwestern interior United States (Preston, H. J. 1977)  
*Triassic:* Triassic coral buildups of western North America (Stanley, G. D., Jr. 1977)

### Rocky Mountains—Structural geology

*Tectonics:* Major tectonic elements and tectonic problems along the line of section from northeastern Oregon to west-central Montana; map summary (Hyndman, D. W. 1979)

### Rubidium—Geochemistry

*Igneous rocks:* Basalts of Oregon (U.S.A.) and their geotectonic environment, I. Petrochemistry of Tertiary basalts of the Oregon Coast Range (Loeschke, J. 1979)

**Sand** *see also under Economic geology; see also under Economic geology under Pacific Coast*

**Sandstone** *see also under Clastic rocks under Sedimentary rocks*

### Sea water—Composition

*Suspended materials:* A study of suspended particulate matter; Arctic Ocean and northern Oregon continental shelf (Peterson, R. E. 1977)  
— Suspended material over the central Oregon continental shelf in May 1974; I. Concentrations of organic and inorganic components (McCave, I. N. 1979)

### Sea water—Geochemistry

*Nitrogen:* Nitrous oxide and methane in Alsea Bay, Oregon (de Angelis, M. A. 1979)

### Sedimentary petrology

*Diagenesis:* Diagenetic alteration and formation of authigenic minerals in the Miocene Rome Beds, Southeast Oregon (Campion, K. M. 1979)  
— Diagenetic alteration and formation of authigenic minerals in the Miocene "Rome Beds", Southeast Oregon (Campion, K. M. 1979)  
— Petrology and diagenetic effects of graywacke sandstones; Eocene Umpqua Formation, Southwest Oregon (Burns, L. K. 1977)  
— Petrology and diagenetic effects of lithic sandstones; Paleocene and Eocene Umpqua Formation, Southwest Oregon (Burns, L. K. 1979)

*Sedimentary rocks:* Grain orientation of massive sandstones (Robertson, C. A. 1976)

— Mesozoic lithic sandstones in central Oregon (Dickinson, W. R. 1979)

— Tertiary volcanoclastic deltas in an arc-trench gap, Oregon Coast Range (Niem, Alan R. 1976)

*Sedimentary structures:* Clastic dikes in southeastern Oregon (Peterson, Norman V. 1978)

— Deposition of upper Mesozoic resedimented conglomerates and associated turbidites in southwestern Oregon (Walker, R. G. 1977)

— Retrogradational shelf sequence; Upper Cretaceous (Campanian-Maastrichtian) Cape

Sebastian Sandstone, southwestern Oregon (Bourgeois, J. 1979)

*Sedimentation:* Beach profiles obtained with an amphibious DUKW on the Oregon and Washington coasts (Komar, P. D. 1977)

— Debris removal and its effects on sedimentation in an Oregon coast range stream (Beschta, R. L. 1979)

— Depositional trends of modern and ancient deep-sea fans (Nelson, C. H. 1976)

— Evidence for a Late Jurassic island arc of the Franciscan Complex, southwestern Oregon (Wiggins, B. D. 1979)

— Modeling of sediment transport processes over uneven erodible beds in marine systems (McLean, S. R. 1976)

— Paleocurrent trends and petrologic variations in Mesozoic strata near South Fork of John Day River, central Oregon (Dickinson, W. R. 1976)

— Provenance, distribution, and alteration of volcanic sediments in a saline, alkaline lake (Deike, R. 1976)

— Sand transport across Eocene shelf and slope in southwestern Oregon (Dott, R. H. Jr. 1978)

— Sediment sources and Holocene sedimentation history in Tillamook Bay, Oregon; data and preliminary interpretations (Glenn, J. L. 1978)

— Sedimentology of two progradational submarine-channel deposits on an active continental margin, Cretaceous, southwestern Oregon (Bourgeois, J. 1979)

— Submarine-fan conglomerates and sandstones, Jurassic of southwestern Oregon, not associated with continental margin (Walker, R. G. 1976)

*Sediments:* Opaque minerals as aids in distinguishing between source and sorting effects on beach-sand mineralogy in southern Oregon (Luepke, G. 1976)

— Sediment characteristics and the trophic status of four Oregon lakes (Davis, G. E. 1976)

— The petrology and stratigraphy of the Portland Hills Silt (Lentz, R. T. 1977)

*Sedimentary rocks* *see also Sedimentary structures; Sedimentation; Sediments*

### Sedimentary rocks—Carbonate rocks

*Limestone:* An exposure of limestone at Gray Butte, Jefferson County, Oregon (Ashwill, M. 1979)

### Sedimentary rocks—Chemically precipitated rocks

*Chert:* Jurassic radiolarian chert from near John Day, Oregon (Jones, D. L. 1976)

### Sedimentary rocks—Clastic rocks

*Conglomerate:* Deposition of upper Mesozoic resedimented conglomerates and associated turbidites in southwestern Oregon (Walker, R. G. 1977)

— Submarine-fan conglomerates and sandstones, Jurassic of

southwestern Oregon, not associated with continental margin (Walker, R. G. 1976)

*Diagenesis:* Diagenetic alteration and formation of authigenic minerals in the Miocene Rome Beds, Southeast Oregon (Campion, K. M. 1979)

— Diagenetic alteration and formation of authigenic minerals in the Miocene "Rome Beds", Southeast Oregon (Campion, K. M. 1979)

*Environmental analysis:* Mesozoic forearc basin in central Oregon (Dickinson, W. R. 1979)

*Fanglomerate:* Petrography of the Rattlesnake Formation at the type area, central Oregon (Enlow, Harold E. 1976)

*Flysch:* Evidence for a Late Jurassic island arc of the Franciscan Complex, southwestern Oregon (Wiggins, B. D. 1979)

*Graywacke:* Petrology and diagenetic effects of graywacke sandstones; Eocene Umpqua Formation, Southwest Oregon (Wiggins, B. D. 1979)

*Lithofacies:* Mesozoic paleogeography and paleotectonics, Suplee-Izee and Aldrich Mountains inner, central Oregon (Dickinson, W. R. 1978)

*Lithostratigraphy:* Stratigraphy and petrography of the Selah Member, Roosevelt-Arlington area, North central Oregon and South central Washington (Farooqui, S. M. 1978)

— The Permian and Triassic Seven Devils Group, western Idaho and northeastern Oregon (Vallier, T. L. 1977)

*Mudstone:* Development of spaced cleavage in deep-sea mudstone; an initial response to subduction (Berglund, P. L. 1978)

*Petrography:* Petrography of selected samples from the Pittsburg Bluff and Cowlitz formations in northwestern Oregon (Van Atta, Robert O. 1976)

*Pyroclastics:* Zeolite-clay mineral zonation of volcanoclastic sediments within the McDermitt Caldera complex of Nevada and Oregon (Glanzman, R. K. 1979)

*Sandstone:* Field guide to the geology of Corvallis and vicinity, Oregon (Lawrence, Robert D. 1977)

— Mesozoic lithic sandstones in central Oregon (Dickinson, W. R. 1979)

— Petrology and diagenetic effects of lithic sandstones; Paleocene and Eocene Umpqua Formation, Southwest Oregon (Burns, L. K. 1979)

— Retrogradational shelf sequence; Upper Cretaceous (Campanian-Maastrichtian) Cape Sebastian Sandstone, southwestern Oregon (Bourgeois, J. 1979)

— Tertiary volcanoclastic deltas in an arc-trench gap, Oregon Coast Range (Niem, Alan R. 1976)

*Trace elements:* Diagenetic and hydrothermal alteration, and trace element distribution in tuffaceous sediments within the McDermitt Caldera, Nevada-Oregon (Rytuba, J. J. 1977)

## Sedimentary structures

*Turbidite:* Fan Valleys, channels, and depositional lobes on modern submarine fans; characters for recognition of sandy turbidite environments (Normark, W. R. 1978)

— Grain orientation of massive sandstones (Robertson, C. A. 1976)

— Paleocurrent trends and petrologic variations in Mesozoic strata near South Fork of John Day River, central Oregon (Dickinson, W. R. 1976)

— Sedimentology of two progradational submarine-channel deposits on an active continental margin, Cretaceous, southwestern Oregon (Bourgeois, J. 1979)

### Sedimentary rocks—Lithofacies

*Environmental analysis:* Sand transport across Eocene shelf and slope in southwestern Oregon (Dott, R. H. Jr. 1978)

*Petrography:* Lithofacies and depositional environments of the Coaledo Formation, Coos County, Oregon (Ryberg, Paul Thomas. 1978)

### Sedimentary rocks—Lithostratigraphy

*Shale:* Pre-Tertiary stratigraphy in the Snake River canyon and adjacent Seven Devils and Wallowa Mountains, northeastern Oregon and western Idaho (Vallier, T. L. 1976)

*Sedimentary structures* *see also Sedimentary rocks; Sediments*

### Sedimentary structures—Bedding plane irregularities

*Genesis:* Modeling of sediment transport processes over uneven erodible beds in marine systems (McLean, S. R. 1976)

### Sedimentary structures—Environmental analysis

*Graded bedding:* Submarine-fan conglomerates and sandstones, Jurassic of southwestern Oregon, not associated with continental margin (Walker, R. G. 1976)

*Marine environment:* Sand transport across Eocene shelf and slope in southwestern Oregon (Dott, R. H. Jr. 1978)

*Nearshore environment:* Retrogradational shelf sequence; Upper Cretaceous (Campanian-Maastrichtian) Cape Sebastian Sandstone, southwestern Oregon (Bourgeois, J. 1979)

*Submarine environment:* Sedimentology of two progradational submarine-channel deposits on an active continental margin, Cretaceous, southwestern Oregon (Bourgeois, J. 1979)

*Submarine fans:* Fan Valleys, channels, and depositional lobes on modern submarine fans; characters for recognition of sandy turbidite environments (Normark, W. R. 1978)

### Sedimentary structures—Interpretation

*Graded bedding:* Deposition of upper Mesozoic resedimented conglomerates and associated turbidites in southwestern Oregon (Walker, R. G. 1977)

## Sedimentary structures

### Sedimentary structures—Planar bedding structures

*Genesis:* The Touchet Beds of the Walla Walla Valley (Carson, R. J. 1978)

### Sedimentary structures—Secondary structures

*Clastic dikes:* Clastic dikes in southeastern Oregon (Peterson, Norman V. 1978)

### Sedimentation—Controls

*Structural controls:* Quaternary sedimentation and tectonics on Oregon continental slope; active-margin environment (Kulm, L. D. 1978)

*Tectonic controls:* Mesozoic forearc basin in central Oregon (Dickinson, W. R. 1979)

### Sedimentation—Cyclic processes

*Beaches:* Seasonal variation in beach erosion and sedimentation on the Oregon coast (Fox, W. T. 1978)

*Dunes:* Daily cycles in coastal dune deposits (Hunter, R. E. 1978)

*Transgression:* Retrogradational shelf sequence; Upper Cretaceous (Campanian-Maastrichtian) Cape Sebastian Sandstone, southwestern Oregon (Bourgeois, J. 1979)

### Sedimentation—Diagenesis

*Consolidation:* Tectonically induced deformation of deep-sea sediments off Washington and northern Oregon; mechanical consolidation (Carson, B. 1977)

### Sedimentation—Environment

*Bays:* Sediment sources and Holocene sedimentation history in Tillamook Bay, Oregon; data and preliminary interpretations (Glenn, J. L. 1978)

*Beaches:* Beach profiles obtained with an amphibious DUKW on the Oregon and Washington coasts (Komar, P. D. 1977)

— Opaque minerals as aids in distinguishing between source and sorting effects on beach-sand mineralogy in southern Oregon (Luepke, G. 1976)

*Deltas:* Tertiary volcaniclastic deltas in an arc-trench gap, Oregon Coast Range (Niem, Alan R. 1976)

*Deposition:* Lithofacies and depositional environments of the Coaledo Formation, Coos County, Oregon (Ryberg, Paul Thomas. 1978)

*Estuaries:* A biogeochemical study of manganese in the estuarine zone (Flegel, A. R., Jr. 1979)

*High-energy environment:* Depositional environments within high-energy tidally dominated embayments along Pacific margin, United States (Rappeport, M. L. 1980)

*Lakes:* Provenance, distribution, and alteration of volcanic sediments in a saline, alkaline lake (Deike, R. 1976)

*Marine environment:* Cambrian and latest Precambrian paleogeography and tectonics in the western United States (Stewart, J. H. 1977)

— Depositional trends of modern and ancient deep-sea fans (Nelson, C. H. 1976)

— Mississippian paleogeography and tectonics of the western United States (Poole, F. G. 1977)

— Ordovician paleogeography of the western United States (Ross, R. J., Jr. 1977)

— Paleozoic rocks of eastern Oregon and western Idaho (Vallier, T. L. 1977)

— Pennsylvanian paleogeographic patterns in the western United States (Rich, M. 1977)

— Permian depositional provinces and tectonics, western United States (Stevens, C. H. 1977)

— Silurian and Devonian paleogeography of the western United States (Poole, F. G. 1977)

— Some Siluro-Devonian biofacies patterns in the western United States (Berry, W. B. N. 1977)

*Submarine environment:* Sedimentology of two progradational submarine-channel deposits on an active continental margin, Cretaceous, southwestern Oregon (Bourgeois, J. 1979)

*Submarine fans:* Fan Valleys, channels, and depositional lobes on modern submarine fans; characters for recognition of sandy turbidite environments (Normark, W. R. 1978)

— Submarine-fan conglomerates and sandstones, Jurassic of southwestern Oregon, not associated with continental margin (Walker, R. G. 1976)

### Sedimentation—Processes

*Floods:* Late Pleistocene sediments and floods in the Willamette Valley (Allison, I. S. 1978)

*Resuspension:* Optical evidence of sediment resuspension; Oregon continental shelf (Chriss, T. M. 1978)

*Sedimentation—Provenance*

*Estuaries:* Estuarine sediment sources in the Tillamook Estuary in Oregon (Glenn, J. L. 1978)

*Island arcs:* Evidence for a Late Jurassic island arc of the Franciscan Complex, southwestern Oregon (Wiggins, B. D. 1979)

*Melange:* Mesozoic lithic sandstones in central Oregon (Dickinson, W. R. 1979)

*Paleocurrents:* Mesozoic paleogeography and paleotectonics, Suplee-Izze and Aldrich Mountains inlier, central Oregon (Dickinson, W. R. 1978)

— Paleocurrent trends and petrologic variations in Mesozoic strata near South Fork of John Day River, central Oregon (Dickinson, W. R. 1976)

*Volcanic ash:* Source directions of pumice and ash deposits near Bend, Oregon (Mimura, K. 1978)

### Sedimentation—Rates

*Eocene:* Planktonic foraminifera of the lower Tertiary Roseburg, Lookingglass, and Flournoy formations, Southwest Oregon (Miles, G. A. 1977)

*Indicators:* Paleogene planktonic foraminifera from Southwest Oregon (Miles, G. A. 1977)

*Interpretation:* Geochronology on Cascadia abyssal plain using high resolution gamma ray spectrometry (Cutshall, N. H. 1978)

### Sedimentation—Transport

*Marine transport:* Beach profile changes and onshore-offshore sand transport on the Oregon coast (Aguilar-Tunon, N. A. 1977)

— Modeling of sediment transport processes over uneven erodible beds in marine systems (McLean, S. R. 1976)

— Sand transport across Eocene shelf and slope in southwestern Oregon (Dott, R. H., Jr. 1978)

— Seasonal reversal of flood-tide dominant transport in a small Oregon estuary (Boggs, S., Jr. 1976)

— Stability of dredged material deposited at ocean dumping sites seaward of Columbia River mouth (Sternberg, R. W. 1977)

— Suspended material over the central Oregon continental shelf in May 1974; I. Concentrations of organic and inorganic components (McCave, I. N. 1979)

— Weather patterns and coastal processes (Fox, W. T. 1976)

*Stream transport:* Debris removal and its effects on sedimentation in an Oregon coast range stream (Beschta, R. L. 1979)

— Erosion, sediment, and related salt problems and treatment opportunities in western states (Hedlund, J. D. 1977)

— Long-term patterns of sediment production following road construction and logging in the Oregon Coast Range (Beschta, R. L. 1978)

— Mechanics of the turbulent boundary layer over sand waves in the Columbia River (McLean, S. R. 1976)

*Sediments* see also *Sedimentary rocks; Sedimentary structures; Sedimentation*

### Sediments—Carbonate sediments

*Lithostratigraphy:* Radiolarian-planktonic foraminifera ratios and Pleistocene deep-sea stratigraphy in the northeastern Pacific off Oregon and Washington (Fowler, G. A. 1977)

### Sediments—Clastic sediments

*Clay:* The many facets of clays, in Corvallis (Hower, W. F. 1976)

*Environmental analysis:* The petrology and stratigraphy of the Portland Hills Silt (Lentz, R. T. 1977)

*Geochemistry:* Sediment characteristics and the trophic status of four Oregon lakes (Davis, G. E. 1976)

*Provenance:* Sediment sources and Holocene sedimentation history in Tillamook Bay, Oregon; data and preliminary interpretations (Glenn, J. L. 1978)

*Pyroclastics:* Morphologic parameters of Mount Mazama and Glacier Peak tephras; a scanning-electron microscope study (Tucker, G. B. 1977)

*Sand:* Major exploratory trenches for Pebble Springs Nuclear Project, Gilliam County, Oregon (Farooqui, S. M. 1976)

## Seismology

— Opaque minerals as aids in distinguishing between source and sorting effects on beach-sand mineralogy in southern Oregon (Luepke, G. 1976)

*Till:* Quaternary glaciation and volcanism, Metolius River area, Oregon (Scott, W. E. 1977)

*Volcanic ash:* Chabazite in siliceous tuffs of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J. III. 1978)

### Sediments—Distribution

*Suspended materials:* Optical evidence of sediment resuspension; Oregon continental shelf (Chriss, T. M. 1977)

### Sediments—Environmental analysis

*Terrestrial environment:* Late Pleistocene sediments and floods in the Willamette Valley (Allison, I. S. 1978)

### Sediments—Lithofacies

*Environmental analysis:* Depositional environments within high-energy tidally dominated embayments along Pacific margin, United States (Rappeport, M. L. 1980)

### Sediments—Properties

*Consolidation:* Tectonic consolidation of deep-sea sediments; preliminary results of laboratory simulation (Carson, B. 1976)

*Physical properties:* Tectonically induced deformation of deep-sea sediments off Washington and northern Oregon; mechanical consolidation (Carson, B. 1977)

*Seismic surveys* see under *Geophysical surveys; see under Geophysical surveys under Pacific Coast*

*Seismology* see also *Engineering geology*

### Seismology—Crust

*Elastic waves:* Ophiolites, seismic velocities and oceanic crustal structure (Christensen, N. I. 1978)

*Strain:* Strain accumulation rates in the western United States between 1970 and 1978 (Prescott, W. H. 1979)

*Structure:* Crustal thickness in northern Nevada from seismic refraction profiles (Stauber, D. A. 1978)

*Velocity structure:* Crustal structure near the Juan de Fuca and Explorer plate boundary from seismic refraction data (Au, D. 1979)

— Seismic studies at the Mt. Hood Volcano, northern Cascade Range, Oregon (Green, S. M. 1979)

— Shear wave structure of the western Snake River plain from surface wave dispersion (Priestley, K. 1979)

— Upper crustal structure of the Mt. Hood, Oregon, region as revealed by time term analysis (Healy, J. H. 1979)

### Seismology—Earthquakes

*Crust:* The April 29, 1965 Puget Sound earthquake and the crustal and upper mantle structure of western Washington and Oregon (Langston, C. A. 1977)

*Epicenters:* Attenuation patterns in the Pacific Northwest based on

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intensity data and the location of the 1872 North Cascades earthquake (Malone, S. D. 1979)

**Magnitude:** Horizontal particle velocity and its relation to magnitude in the western United States (Espinosa, A. F. 1979)

— The Deschutes Valley earthquake of April 12, 1976 (Couch, Richard, 1976)

**Mantle:** The April 29, 1965 Puget Sound earthquake and the crustal and upper mantle structure of western Washington and Oregon (Langston, C. A. 1977)

**Occurrence:** Earthquake history of Oregon (von Hake, C. A. 1976)

**Properties:** A study of the October 12, 1877, Oregon earthquake (Thenhaus, P. C. 1978)

**Swarms:** The Adel, Oregon earthquake sequence; evidence for present-day subduction tectonics in northwestern Nevada (Schaff, S. C. 1976)

— The 1968 Adel, Oregon, earthquake swarm (Schaff, S. C. 1976)

### Seismology—Elastic waves

**Teleseismic signals:** Corvallis, Oregon, crustal and upper mantle receiver structure from teleseismic P and S waves (Langston, C. A. 1977)

### Seismology—Microearthquakes

**Detection:** Sonobuoy array measurements of active faulting on the Gorda Ridge (Jones, P. R. 1978)

**Distribution:** Microearthquakes near Portland, Oregon (Johnson, Ansel G. 1977)

### Seismology—Seismicity

**Epicenters:** A seismicity study of the Pacific Northwest region of the United States, November 1961 - August 1965 (Racine, D. 1979)

**Volcanoes:** Seismic studies at the Mt. Hood Volcano, northern Cascade Range, Oregon (Green, S. M. 1979)

— Seismicity studies of the Mount Hood, Oregon, area (Weaver, C. S. 1979)

**Shale** see under Lithostratigraphy under Sedimentary rocks

**Sheet silicates** see under Minerals

**Shore features** see under Geomorphology

**Shorelines** see also under Engineering geology

**Silicates** see under Minerals

**Silurian** see also under Stratigraphy under Western U.S.

**Slope stability** see also Engineering geology; Geomorphology

**Soil mechanics** see also Rock mechanics

### Soil mechanics—Case studies

**Stability:** Performance of a thin metal retaining wall with multiple anchorage (Schroeder, W. L. 1976)

### Soil mechanics—Experimental studies

**Slope stability:** Influence of soil aggregation on slope stability in the Oregon Coast Ranges (Yee, C. S. 1977)

### Soils—Erosion

**Landslides:** Timber harvesting, mass erosion, and steepland forest geomorphology in the Pacific Northwest (Swanson, D. N. 1976)

### Soils—Surveys

**California:** Comparison of relative age dating (RAD) data from eastern Sierra Nevada cirque deposits with those from the tephrochronologically age controlled deposits of the Wallowa Mountains, Oregon (Burke, R. M. 1978)

**Idaho:** Erosion research in the dryland grain region of the Pacific Northwest; recent developments and needs (McCool, D. K. 1977)

**Regional:** Environmental geology of the Kellogg Creek - Mt. Scott Creek and lower Clackamas River drainage areas, northwestern Clackamas County, Oregon (Brunengo, M. J. 1978)

— Erosion research in the dryland grain region of the Pacific Northwest; recent developments and needs (McCool, D. K. 1977)

— Land use and management of soils with relict duripans, southwestern Oregon (U.S.A.) (Herriman, R. C. 1979)

— Long-term patterns of sediment production following road construction and logging in the Oregon Coast Range (Beschta, R. L. 1978)

— Relationships of clay mineralogy to landscape stability in western Oregon (Taskey, R. D. 1978)

— Soil-geomorphology relations in mountains of Oregon, U.S.A. (Parsons, R. B. 1978)

— Stratigraphy and land use of the post-Diamond Hill Paleosol, western Oregon (Parsons, R. B. 1979)

— Water and anion movement in selected soils of western Oregon (Hammermeister, D. P. 1977)

**Washington:** Erosion research in the dryland grain region of the Pacific Northwest; recent developments and needs (McCool, D. K. 1977)

**Western U.S.:** Erosion, sediment, and related salt problems and treatment opportunities in western states (Hedlund, J. D. 1977)

### Soils—Waste disposal

**Human waste:** Land utilization and disposal of organic wastes in cool subhumid and humid regions (Vettes, F. G., Jr. 1977)

**Speleology** see under Solution features under Geomorphology

**Springs** see also Ground water; Hydrogeology; see also under Hydrogeology under Great Basin; Pacific Coast

### Springs—Geochemistry

**Mineral waters:** A model for fluids in metamorphosed ultramafic rocks (Pfeifer, H. R. 1977)

### Standard materials—Igneous rocks

**Nepheline syenite:** Nepheline syenite, STM-1, from Table Mountain, Oregon (Snavely, P. D., Jr. 1976)

**Quartz latite:** Quartz latite (delle-nite), QLO-1, from southeastern Oregon (Walker, G. W. 1976)

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**Carboniferous:** Carboniferous formations in Oregon (Baldwin, Ewart M. 1979)

**Cenozoic:** Cenozoic molluscan stages of Oregon and Washington (Armentrout, J. M. 1977)

— Geologic cross section of the central Oregon continental margin (Snavely, P. D., Jr. 1980)

— Interpretation of the Cenozoic geologic history, central Oregon continental margin; cross-section summary (Snavely, P. D., Jr. 1980)

— Late Cenozoic ash-flow tuffs and their vents, eastern Oregon (Walker, G. W. 1976)

— Magmatic evolution of the central Oregon Cascades (McBirney, A. R. 1976)

— Major exploratory trenches for Pebble Springs Nuclear Project, Gilliam County, Oregon (Farooqui, S. M. 1976)

— Origin of the McDermitt Caldera in Nevada and Oregon and its related mercury deposits (McKee, E. H. 1976)

— Progress report on Cenozoic correlations, west coast North America (Armentrout, J. M. 1978)

— Revisions to the Cenozoic stratigraphy of Harney Basin, southeastern Oregon (Walker, G. W. 1979)

— Steens Mountain, Oregon (Lund, E. H. 1976)

**Changes of level:** Quaternary sedimentation and tectonics on Oregon continental slope; active-margin environment (Kulm, L. D. 1978)

**Cretaceous:** First occurrence, systematics, and functional morphology of Nipponites (Cretaceous Lytoceratina) from the Americas (Ward, P. D. 1977)

— Paleocurrent trends and petrologic variations in Mesozoic strata near South Fork of John Day River, central Oregon (Dickinson, W. R. 1976)

**Devonian:** Devonian brachiopods and conodonts from central Oregon (Johnson, J. G. 1978)

— Middle Devonian (Givetian) conodonts from central Oregon (Savage, N. M. 1979)

**Eocene:** A preliminary study of Lookingglass Formation (Eocene) stratigraphy of the northwest quarter of the Dutchman Butte Quadrangle (Koler, Thomas E. 1979)

— An Eocene foraminiferal fauna from Bandon, Oregon (Link, R. L. 1976)

— An extinct Evodia wood from Oregon (Gregory, I. 1976)

— Biostratigraphy of the Texaco Clark and Wilson No. 6-1 Well, Columbia County, Oregon (McKeel, Daniel R. 1979)

— Calcareous plankton biostratigraphy of the type Bastendorff Formation, Southwest Oregon (Warren, A. D. 1977)

— Depositional trends of modern and ancient deep-sea fans (Nelson, C. H. 1976)

— Field guide to the geology of Corvallis and vicinity, Oregon (Lawrence, Robert D. 1977)

— Holothurian microfossils and Eocene stratigraphy of Southwest Oregon (Orr, W. N. 1978)

— Late Eocene foraminiferal biostratigraphy and paleoecology of northwestern Oregon (McDougall, K. 1977)

— Lithofacies and depositional environments of the Coaledo Formation, Coos County, Oregon (Ryberg, Paul Thomas. 1978)

— Micropaleontological study of four deep wells in Coos County, Oregon (McKeel, Daniel R. 1979)

— Middle and upper Eocene biostratigraphy (foraminifera) of the Cascade Head area, Lincoln and Tillamook counties, Oregon (Callender, A. D., Jr. 1977)

— Paleoecologic evaluation of late Eocene zonations of West Coast (McDougall, K. 1979)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetic evidence for tectonic rotation of the Oregon Coast Range (Simpson, R. W., Jr. 1977)

— Paleomagnetism of the middle Tertiary Clarno Formation, North-central Oregon; constraint on models for tectonic rotation (Beck, M. E., Jr. 1978)

— Petrography of selected samples from the Pittsburg Bluff and Cowlitz formations in northwestern Oregon (Van Atta, Robert O. 1976)

— Planktonic foraminifera of the lower Tertiary Roseburg, Lookingglass, and Flournoy formations, Southwest Oregon (Miles, G. A. 1977)

— Stratigraphy of the middle to late Eocene formations of southwestern Willamette Valley, Oregon (Gandera, William Edward. 1977)

— Subsurface correlations in the Mist area, Columbia County, Oregon (Newton, Vernon C., Jr. 1979)

— Tectonic rotation of Eocene volcanic rocks in the Coast Range of Oregon (Cox, A. 1976)

— Tectonic rotation of middle Eocene sediments in the Coast Range of Oregon (Simpson, R. W., Jr. 1976)

— Tectonic rotation of the Oregon Coast Range (Cox, A. 1977)

— The Clarno Formation of central Oregon, U.S.A.; volcanism on a thin continental margin (Rogers, J. J. W. 1977)

**Holocene:** Hydration dating of volcanism at Newberry Crater, Oregon (Friedman, I. 1977)

**Jurassic:** Biostratigraphy of the Snowshoe Formation (Jurassic) in the Izee area, Grant County, Oregon (Smith, P. L. 1976)

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- Biostratigraphy of the type Weberg Member, Snowshoe Formation, Grant County, Oregon (Taylor, D. G. 1977)
- Deposition of upper Mesozoic resedimented conglomerates and associated turbidites in southwestern Oregon (Walker, R. G. 1977)
- Paleocurrent trends and petrologic variations in Mesozoic strata near South Fork of John Day River, central Oregon (Dickinson, W. R. 1976)
- Petrology of the Rogue River area, Klamath Mountains, Oregon; problems in the identification of ancient volcanic arcs (Garcia, M. O. 1976)
- Pre-Tertiary stratigraphy in the Snake River canyon and adjacent Seven Devils and Wallowa Mountains, northeastern Oregon and western Idaho (Vallier, T. L. 1976)
- Rogue River island arc complex, western Jurassic belt, Klamath Mountains, Oregon (Garcia, M. O. 1976)
- Submarine-fan conglomerates and sandstones, Jurassic of southwestern Oregon, not associated with continental margin (Walker, R. G. 1976)
- The amphibolite of Briggs Creek; a tectonic slice of metamorphosed oceanic crust in southwestern Oregon? (Coleman, R. G. 1976)

*Maps:* Geologic cross section of the central Oregon continental margin (Snavely, P. D., Jr. 1980)

*Mesozoic:* Jurassic radiolarian chert from near John Day, Oregon (Jones, D. L. 1976)

— Mesozoic forearc basin in central Oregon (Dickinson, W. R. 1979)

— Mesozoic metavolcanic sequences in the northern Klamath Mountains, southwestern Oregon (Johnson, M. G. 1977)

— Mesozoic paleogeography and paleotectonics, Suplee-Izee and Aldrich Mountains inlier, central Oregon (Dickinson, W. R. 1978)

— Paleogeographic and paleotectonic implications of Mesozoic stratigraphy and structure in the John Day inlier of central Oregon (Dickinson, W. R. 1978)

— Paleomagnetic evidence for clockwise rotation in western Idaho, eastern Oregon, and northern Nevada (Basham, W. L. 1978)

— Pre-Cenozoic tectonic framework, eastern Oregon and western Idaho (Brooks, Howard C. 1976)

— Radiolarians from Mesozoic rocks in western Oregon (Blair, W. N. 1978)

— Radiolarians from pre-Nevadan rocks of the Klamath Mountains, California and Oregon (Irwin, W. P. 1978)

— Rb-Sr and K-Ar geochronometry of granitic rocks west of the Idaho Batholith in western Idaho and Northeast Oregon (Armstrong, R. L. 1976)

- Rb-Sr and K-Ar geochronometry of Mesozoic granitic rocks and their Sr isotopic composition, Oregon, Washington, and Idaho (Armstrong, R. L. 1977)
- Structures of the Canyon Mountain (Oregon) ophiolite complex (Ave Lallement, H. G. 1976)
- The John Day area; an example of pre-Tertiary geology in the Blue Mountain region; Oregon-Idaho (Thayer, T. P. 1976)
- Miocene:* A new late Hemingfordian mammal fauna from the John Day Formation, Oregon, and its stratigraphic implications (Woodburn, M. O. 1977)
- An exposure of limestone at Gray Butte, Jefferson County, Oregon (Ashwill, M. 1979)
- Columbia River Basalt Group stratigraphy and structure in the Bull Run watershed, western Cascades, northern Oregon (Vogt, Beverly F. 1979)
- Columbia River Basalt Group stratigraphy in western Oregon (Beeson, Marvin H. 1979)
- Flavonoid and other chemical constituents of fossil Miocene *Celtis* and *Ulmus* (Succor Creek flora) (Giannasi, D. E. 1977)
- Flavonoids and other chemical constituents of fossil Miocene *Zelkova* (Ulmaceae) (Niklas, K. J. 1977)
- Geochemistry and origin of basalt of the Columbia River Group, Oregon and Washington (McDougall, I. 1976)
- Geochemistry and thermolysis of flavonoids (Niklas, K. J. 1977)
- Magnetostratigraphy and correlation of Miocene basalts of the northern Oregon coast and Columbia Plateau, Southeast Washington (Choiniere, S. R. 1979)
- Magnetostratigraphy of the Imnaha and Grande Ronde basalts in the southeast part of the Columbia Plateau (Hooper, P. R. 1979)
- Neogene molluscan stages of Oregon and Washington (Addicott, W. O. 1976)
- New Miocene formation at Coos Bay, Oregon (Armentrout, J. M. 1978)
- Paleomagnetic correlation and magnetostratigraphy of Miocene basalts of the Oregon coast and Columbia Plateau (Choiniere, S. R. 1976)
- Preliminary correlation of lower Yakima Basalt flows in western Oregon with the type area in central Washington (Beeson, Marvin H. 1976)
- Stratigraphic resolution of ambiguities in the interpretation of unusual paleomagnetic directions in Miocene basalts of the Oregon coast (Choiniere, S. R. 1976)
- Stratigraphy and structure of the Columbia River Basalt Group in the Cascade Range, Oregon (Moran, Michael R. 1979)
- Stratigraphy and structure of the Columbia River Group in the Cascade Range, Oregon (Beeson, Marvin H. 1979)
- Tectonic significance of the paleomagnetism of the Frenchman Springs Basalt, Oregon and Washington (Kienle, Clive F., Jr. 1978)
- The stratigraphy and structure of the Columbia River Basalt in the Clackamas River area (Anderson, James Lee. 1977)
- Volcanism and mineralization of the McDermitt Caldera, Nevada-Oregon (Rytuba, J. J. 1976)
- $^{40}\text{Ar}$ - $^{39}\text{Ar}$  age determinations on the Owyhee basalt of the Columbia Plateau (Bottomley, R. J. 1976)
- Neogene:* Late Cenozoic marine invertebrates from Northwest California and Southwest Oregon (Roth, B. 1979)
- Stratigraphy and structure of the Columbia River Basalt in the Cascade Range, Oregon (Beeson, Marvin H. 1979)
- Stratigraphy, structure, and petrology of Columbia River Basalt in a portion of the Grande Ronde River - Blue Mountains area of Oregon and Washington (Ross, M. E. 1978)
- Oligocene:* An exposure of limestone at Gray Butte, Jefferson County, Oregon (Ashwill, M. 1979)
- Bathyal gastropods of the family Turridae in the early Oligocene Keasey Formation in Oregon, with a review of some deep-water genera in the Paleogene of the eastern Pacific (Hickman, C. S. 1976)
- Petrography of selected samples from the Pittsburg Bluff and Cowlitz formations in northwest Oregon (Van Atta, Robert O. 1976)
- Tectonic rotation of Oligocene intrusive rocks in the Coast Range of Oregon; a constant rate of rotation for the period 50-30 m.y. B.P. (Plumley, P. W. 1977)
- Paleocene:* The age of the "Pilot Rock Flora", Umatilla County, Oregon (Eelemendorf, J. 1978)
- Paleogene:* Late Eocene and Oligocene benthonic foraminiferal correlations between California and the Pacific Northwest (Tipton, A. 1977)
- Paleogene planktonic foraminifera from Southwest Oregon (Miles, G. A. 1977)
- Paleozoic:* Paleozoic rocks of eastern Oregon and western Idaho (Vallier, T. L. 1977)
- Pre-Cenozoic tectonic framework, eastern Oregon and western Idaho (Brooks, Howard C. 1976)
- Permian:* Petrology and initial tectonic setting of Permian and Triassic volcanic rocks, northeastern Oregon and western Idaho (Batiza, R. 1976)
- Pre-Tertiary stratigraphy in the Snake River canyon and adjacent Seven Devils and Wallowa Mountains, northeastern Oregon and western Idaho (Vallier, T. L. 1976)
- The John Day area; an example of pre-Tertiary geology in the Blue Mountain region; Oregon-Idaho (Thayer, T. P. 1976)
- The Permian and Triassic Seven Devils Group, western Idaho and northeastern Oregon (Vallier, T. L. 1977)

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- Pleistocene:* Quaternary geology of the Pacific Northwest (Easterbrook, D. J. 1976)
- Pliocene:* Chabazite in siliceous tuffs of a Pliocene lacustrine deposit near Durkee, Baker County, Oregon (Gude, A. J., III. 1976)
- Petrography of the Rattlesnake Formation at the type area, central Oregon (Enlow, Harold E. 1976)
- Quaternary:* Late Pleistocene and Holocene zoogeography, Pacific Northwest coast (Kennedy, G. L. 1979)
- Obsidian hydration dating of volcanic events (Friedman, I. 1976)
- Quaternary glaciation and volcanism, Metolius River area, Oregon (Scott, W. E. 1977)
- Stratigraphy and petrology of late Quaternary terrace deposits around Tillamook Bay, Oregon (Frye, W. H. 1976)
- The Warner Valley, Oregon; a test of pluvial climatic conditions (Weide, D. L. 1976)
- Tertiary:* A new amphisbaenian (Reptilia; Amphisbaenia) from the Oligocene-Miocene John Day Formation, Oregon (Berman, D. S. 1976)
- An overview of the state and federal studies in foraminiferal biostratigraphy of the Pacific Northwest Tertiary province (Rau, W. W. 1977)
- Chemistry, petrography, and stratigraphy of the Columbia River Group in the Imnaha River valley region, eastern Oregon and western Idaho (Kleck, W. D. 1976)
- Geochemical data on Columbia River Basalt stratigraphy in western Oregon (Beeson, Marvin H. 1976)
- Geology of the Saddle and Humbug Mountain area, Clatsop County, northwestern Oregon (Penoyer, E. 1976)
- Neogene molluscan stages of Oregon and Washington (Addicott, W. O. 1976)
- Palaeomagnetic record of a late Tertiary field reversal (Dodson, R. 1978)
- Paleomagnetism of basalt flows, North central Deschutes-Umatilla Plateau, Oregon (Farooqui, S. M. 1976)
- Petrogenesis of Picture Gorge basalts; a preliminary report (Goles, G. G. 1976)
- Significance of pectinids in Tertiary biochronology of the Pacific Northwest states (Addicott, W. O. 1977)
- Stratigraphy and petrography of the Selah Member of the Ellensburg Formation in south-central Washington and north-central Oregon (Kent, Mavis Hensley. 1978)

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- Stratigraphy and petrography of the Selah Member, Roosevelt-Arlington area, North central Oregon and South central Washington (Farooqui, S. M. 1978)
- Tertiary volcanoclastic deltas in an arc-trench gap, Oregon Coast Range (Niem, Alan R. 1976)
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