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COVER PHOTO

Oregon Museum of Science and Industry's Camp Hancock, located in central Oregon's John Day River valley. Article beginning on next page profiles the life of Lon Hancock, the paleontologist after whom Camp Hancock was named. (Photo courtesy OMSI)

Two eastern Oregon quads mapped

The Bullrun Rock and Rastus Mountain 7½-minute quadrangles south of Unity in eastern Oregon are the subjects of two new geologic maps (scale 1:24,000) completed by the Oregon Department of Geology and Mineral Industries with the cooperation of the U.S. Forest Service. These maps can be used to guide mineral exploration, planning, and land management.

Geologic mapping of the Bullrun Rock quadrangle was done by H.C. Brooks and M.L. Ferns; mapping of the Rastus Mountain quadrangle was by Brooks, Ferns, R.W. Nusbaum, and P.M. Kovich.

Important units on the maps include the Jurassic Weatherby Formation and intrusive bodies of probable Cretaceous age. Locally these units have been mineralized and contain small amounts of copper and molybdenum sulfides. The area may have future mining potential, and considerable prospecting is occurring there now.

Blackline prints of the maps, identified as Open-File Reports 0-79-6 (Bullrun Rock) and 0-79-7 (Rastus Mountain), are available now for purchase, at \$2.00 per map. They may be bought or ordered by mail from the Oregon Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201, and from the Baker field office, 2033 First Street, Baker, 97814. Payment must accompany orders of less than \$20.00. □

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Alonzo Wesley "Lon" Hancock (1884-1961): a profile

by Viola L. Oberson, 3569 NE Stanton, Portland, Oregon 97212

Mrs. Oberson has been a member and officer of the Geological Society of the Oregon Country (GSOC) for many years. She was the first employee of the Oregon Museum of Science and Industry (OMSI) "and very much part of the successful efforts to bring OMSI to completion" (GSOC Geological News Letter, v. 28, no. 4, April 1962, p. 21). Currently Mrs. Oberson, a freelance writer in Portland, is working on a biography of Lon Hancock, the amateur paleontologist who was the first to discover vertebrate fossils in the Eocene Clarno Formation of north-central Oregon. (Ed.)

Paleontologists the world over know of Lon Hancock's work. Professional men from the universities and museums of the world came to his door to study the fossils he found. He considered himself an amateur, attained no college degrees, and published no scientific papers, but the fossils his persistence enabled him to find have been the subjects of numerous papers, master's theses, and doctoral dissertations. And part of the geologic history of ancient Oregon has had to be rewritten because of his discoveries.

Starting in the early 1930's, Lon Hancock combed the John Day-Clarno hills of north-central Oregon in his spare time, looking for vertebrate fossils in the Eocene Clarno Formation. At times he was accompanied by such scientists as Ralph Chaney, University of California; Chester Arnold, University of Michigan; Chester Stock, California Institute of Technology; Charles Falkenbach, American Museum of Natural History; Donald E. Savage, University of California at Berkeley; and Richard A. Scott and Jack Wolfe, U.S. Geological Survey. Sometimes his search parties consisted of a few friends, and often he went with his wife Berrie, who would drive their car so he could concentrate on looking for outcrops on the hills or in roadcuts. When he retired after 35 years of carrying mail by horse cart and on foot for the U.S. Postal Service in Portland, he believed he had hiked as much on the hills of his beloved Clarno-John Day country as he had walked the sidewalks of Portland.

The Eocene Clarno Formation consists of andesite, mudflows, and tuffaceous sandstones, siltstones, and conglomerates (Oles and Enlows, 1971). It was named by John C. Merriam, who in 1898 led a University of California field party in the exploration of the John Day Basin. At that time, and for many years after, although numerous plant fossils were collected from the Clarno Formation, no vertebrate fossils were found.

Thomas Condon (1910) wrote: "Just why the remains of these same Eocene mammals have not been found in eastern Oregon is one of our unsolved problems. Either the Shoshone region was cut off from the Wasatch region by intervening waters, or if these animals lived in Oregon, their remains may yet be

found." Edwin T. Hodge (1941), University of Oregon, wrote: "The only fossils found in the Clarno are plants; no animal remains have been found."

For many years, the search was on to find a bone! In other parts of the world, geologic formations with the same fossil flora had yielded vertebrate fossils as well. Why the John Day Formation, stratigraphically just above the Clarno Formation, should be so rich in vertebrate fossils—and not the Clarno—was a question that challenged both professional and amateur paleontologists and geologists.

On May 28, 1938, Hancock received permission from State Superintendent of Parks S.H. Boardman to dig and collect fossils in John Day Fossil State Park. Together with a friend, Tom Bones, he made the first discoveries of agatized nuts and other fossilized fruits and seeds in what later became known as the Clarno Nut Beds. Since 1942, Tom Bones has devoted his studies entirely to this area, and OMSI recently published a paper on his work (Bones, 1979).

Lon Hancock in his home museum, showing fossil nuts, seeds, and leaves from the Clarno Nut Beds.

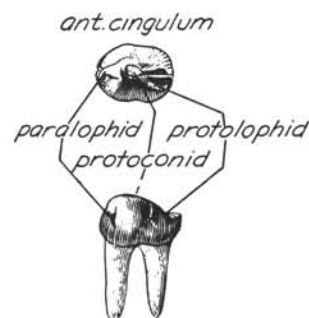


In 1952, a package of seeds and nuts sent from Hancock was examined by Richard A. Scott, then in London, together with Marjorie E.J. Chandler, Curator of the Department of Paleobotany at the British Museum. One pitted seed was identified as a new species of the same genus as a smaller "peach pit" specimen found in the London Clay. Scott wrote to Hancock: "Its relatives lived only in the Malay Peninsula and have never been found either living or fossil in America before—and this large specimen is over twice as large as any previously known species of this genus. If you would be willing to donate this specimen to the University of Michigan Museum, I would like to describe it as a new species, *Paleophytocrene hancockii*, if you don't object to the use of your name." Hancock answered promptly that he would be honored to lend his name to this new species, which was the first of several to carry his name.

Large Clarno Nut Bed collections are now in the Smithsonian Institution in Washington, D.C., and at the Visitors' Center, dedicated August 23, 1978, at the John Day Fossil Beds National Monument, on the former Cant Ranch, Dayville, Oregon. Most of the specimens were collected by Tom Bones.

Hancock continued his search for fossils and in September 1942 made a find that cleared up one aspect of Oregon's ancient history. His consuming dream had

Lon Hancock, working at the Clarno Nut Beds.
(Photo courtesy Ed Bushby)



Rhinoceros tooth found by Hancock in the Clarno Formation. Drawing of Hyrachus sp. tooth by Owen J. Poe (Stirton, 1944, p. 265).

finally come true. Squeezed tightly against a fossilized walnut was a perfectly formed tooth! Here was proof that animals lived during the Eocene in Oregon. Lon and Berrie hand carried this precious specimen to R.A. Stirton, University of California at Berkeley, who wrote in his 1944 identification monograph:

"The only known fossil mammal tooth from the Clarno Formation of Oregon is a rhinoceros second lower premolar which was discovered near the Clarno Bridge on the east side of the John Day River... in Wheeler County, Oregon. The specimen was found in a tuffaceous matrix bearing crystals of pyroxene and feldspar; many poorly preserved plants were also present. It was found by Mr. A.W. Hancock of Portland, Oregon, in September 1942 and was presented to the University of California Museum of Paleontology for description and preservation.... This, then, is the first specimen recorded outside of the Rocky Mountain area on this continent" (Stirton, 1944).

This discovery of a Clarno *Hyrachyus* or rhinoceros tooth dated the Clarno Formation as middle Eocene (Stirton, 1944) and led to the discovery of the mammal beds.

In April 1954, Al McGuiness directed Hancock to a spot a mile north of the Clarno Nut Beds where he had found some flat "stones" lying loose. Hancock recognized them as bones. He returned to the site five more times with either Murray Miller, Rudolph Erickson, Leo Simon, or Tom Bones, digging many test holes and finally finding some other bones, both small and large, this time in place. From these "new diggings" he later found many specimens that were added to his collection or sent encased in plaster of Paris to the University of Oregon Natural History Museum under the care of the director, J.A. Shotwell.

One of these specimens, a tapir skull, was identified in 1963 and posthumously named for "the late A.W. Hancock, who was the first to discover a fossil mammal in the Clarno Formation" (Radinski, 1963). Radinsky, in his Yale University doctoral dissertation, identified



Part of Hancock's home museum. Here over 15,000 children became acquainted with the life of the past.

one of Hancock's finds as the anterior part of a tapir skull with teeth and named it *Colodon? hancockii*, sp. nov. It is expected that many other specimens that Lon collected will receive the name *hancockii* when all of the bones, teeth, skulls, and skeletal parts which he sent to the University of Oregon Natural History Museum or gave to OMSI have been identified. Many of the skulls that he collected are now on loan to the Department of Paleontology of the University of California at Berkeley, where Bruce Hansen is in charge of their care and identification.

Hancock found in the Clarno digs the largest fossil skull yet found west of the Rockies—that of the giant "Thunderbeast" *Brontotherium*. Hancock unearthed rhinos, alligators, tiny camels, great cats, clawed horses, and horses tiny enough to have been carried under his arm or in his pocket. He also found parts of animals that had earlier been found only east of the Rockies and in Asia, among them *Titanotherium*, *Amyrnodon*, *Uintatherium*, *Hyrachyus*, *Chalicotherium*, and *Hyaenodon*. As Phil Brogan wrote in the July 8, 1979, *Oregonian*: "Many other mammal finds have been made in the Clarno beds in recent years. They have linked Oregon's Clarno lands with the ancient continent of North America of the early Cenozoic Era."

Lon Hancock was a most generous man. He shared his home museum with classes of grade school children

twice a week during the school year. Over 15,000 children, including boy scouts, girl scouts, and campfire girls, and nearly as many high school and college students and adults came to his museum room, which was arranged according to geologic eras and backgrounded by *Life* magazine posters picturing the flora and fauna of each period. His generosity with his lifetime collection of mammal fossils, rocks, minerals, fossil leaves, nuts, and fruits was evidenced by his willingness to have it used forever as a learning tool. His case of fossil skulls and skeletal bones brought the first

Tom Bones (left) and Lon Hancock at work in the Clarno Nut Beds.





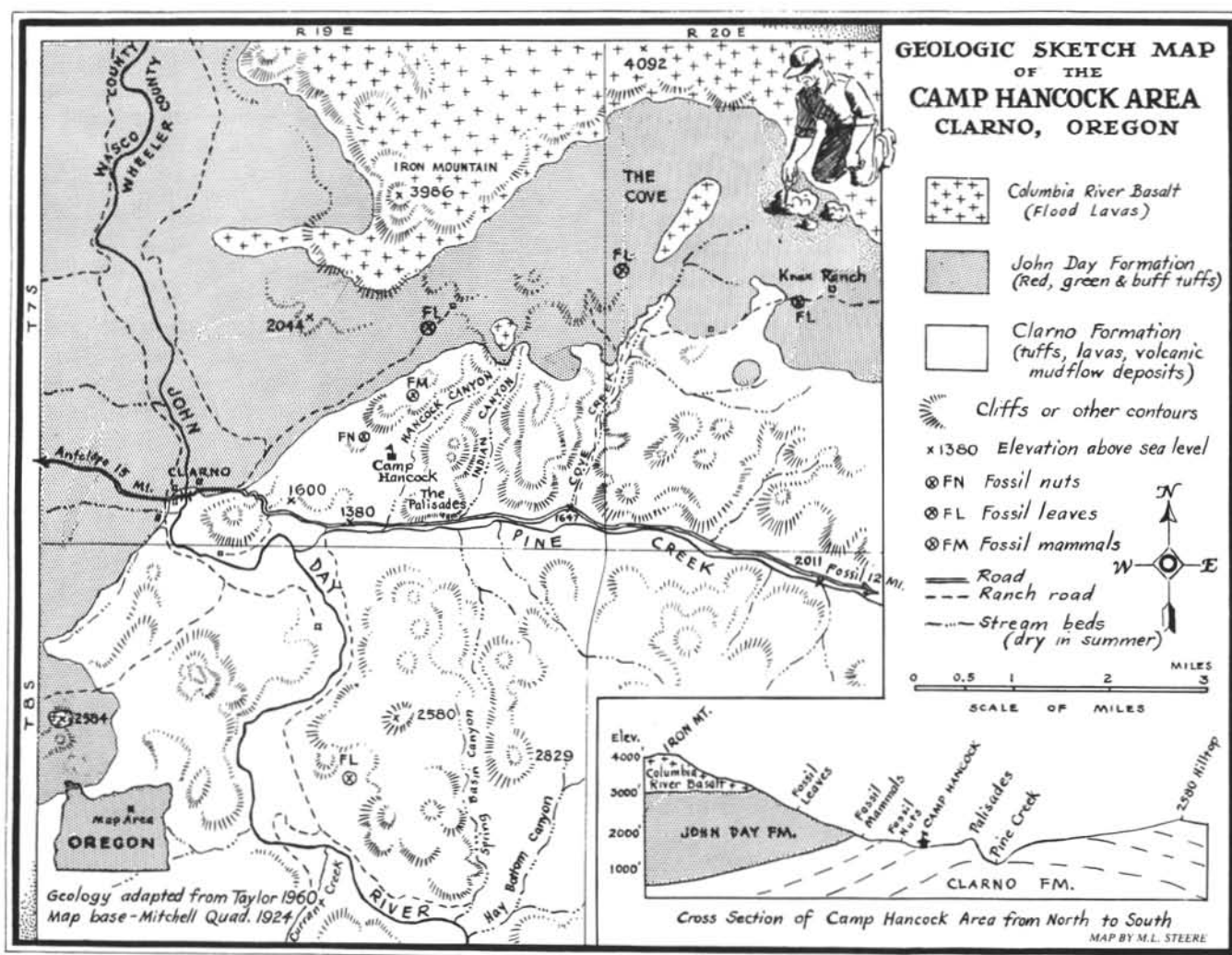
Part of Hancock's fossil collection, as arranged at OMSI by his wife Berrie. (Photo courtesy Delano Photographics)

visitor to the old "Writing Room" in the historic Portland Hotel where OMSI's original office and display room were set up by John C. Stevens and managed by this author. In accordance with Hancock's wishes, his entire home museum collection was given to OMSI after his death.

Lon and Berrie had no children of their own, but their generosity and dedication to youth is marked by their establishment of an outdoor school in Lon's beloved Clarno land. They spent a year of weekends stockpiling rocks away from where the kitchen, dining room, and tents would be placed. Lon drew his plans well for this school whose textbooks he knew he could unfold for all who would come. No other man could hold so many spellbound with the story of the geologic ages as he did on the top of Red Hill with his "sermon on the mount." The spot he chose for the site of his first outdoor school later became known as Camp Hancock. It

Camp Hancock in its early days. (Photo courtesy Ed Bushby)





is now a place name on all Oregon maps and is described by Lewis L. McArthur in his book *Oregon Geographic Names*:

"Camp Hancock, Wheeler County. Camp Hancock is a memorial to Lon W. Hancock, an amateur paleontologist and geologist. Hancock was born in Harrison, Arkansas in 1884. He left school at an early age and spent most of his adult life as a Post Office employee in Portland. He had an abounding interest in fossil hunting and during the 1940s he began taking young boys on outings in the Clarno area. These became more complex and in 1951 Lon and his wife took fourteen boys and ten volunteer staff members for the first formal twelve day summer camp at Camp Hancock under the sponsorship of the Oregon Museum of Science and Industry. Interest grew apace and the early tent camp has grown to a modern, well-equipped facility. Hancock died in 1961 and left his collection of more than 10,000 fossils and artifacts to OMSI" (McArthur, 1974, p. 111-112).

Truly, as is inscribed on Lon's posthumously awarded OMSI trophy, he was "A devoted paleontologist who dedicated his future so that others could learn of the past."

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Biostratigraphy of the Texaco Clark and Wilson No. 6-1 Well, Columbia County, Oregon

by Daniel R. McKeel, Consulting Paleontologist, Route 1, Box 157A, Otis, Oregon 97368

The following report is based on interpretations of Foraminifera at 42 different horizons within the interval from 30 to 8,451 ft. Unprocessed core and ditch samples and some previously picked faunal slides were borrowed from the Oregon Department of Geology and Mineral Industries and from the Department's R.E. Stewart Collection stored at Portland State University.

Essentially three intervals were found to contain age-diagnostic faunas: 575-2,052 ft; 3,282-4,325 ft; and 8,021-8,308 ft. All are interpreted to be equivalent to the Narizian Stage of Mallory (1959). The deepest upper Narizian fauna in this study was found at 4,325 ft. Narizian faunas below 8,000 ft are too sparse to allow determination whether they are upper or lower Narizian in age.

Open marine conditions are indicated by the presence of Radiolaria in all three of the above-mentioned intervals. A regressive sequence is evident in the upper half of the well. Bathyal faunas are present from 4,325 up to 3,282 ft and from 2,040 to 2,052 ft; outer neritic to upper bathyal faunas extend from 1,818 up to 700 ft; and neritic faunas occur from 575 up to 215 ft.

A detailed study (at 30-ft intervals) from 30 to 575 ft may show that some of this section is post-Narizian in age. The two fossiliferous samples (215 and 395 ft) studied here contain Foraminifera, but they are too sparse for age interpretation with any certainty.

Foraminiferal report

Depth (ft)	Stage/Age	Paleoenvironment
30 (ditch)*	Indeterminate	Marine (based on lith only)
215 (ditch)*	Indeterminate	Neritic
395 (ditch)*	Indeterminate	Open marine, near-shore neritic
575 (ditch)*	Narizian (upper Eocene)	Open marine, neritic
700-710 (core)**	Upper Narizian (upper Eocene)	Open marine, outer neritic—upper bathyal
915-925 (core)**	Upper Narizian (upper Eocene)	Open marine, outer neritic—upper bathyal
1,103-1,113 (core)**	Upper Narizian (upper Eocene)	Outer neritic—upper bathyal
1,325-1,335 (core)**	Upper Narizian (upper Eocene)	Open marine, outer neritic—upper bathyal
1,548-1,558 (core)**	Upper Narizian (upper Eocene)	Neritic to upper bathyal
1,568-1,574 (core)**	Upper Narizian (upper Eocene)	Neritic to upper bathyal
1,814-1,818 (core)**	Upper Narizian (upper Eocene)	Open marine, outer neritic—upper bathyal
2,040-2,052 (core)**	Upper Narizian (upper Eocene)	Nearshore bathyal

Depth (ft)	Stage/Age	Paleoenvironment
2,992-3,002 (core)**	Indeterminate	Marine
3,282-3,292 (core)**	Upper Narizian (upper Eocene)	Open marine, near-shore bathyal
3,435-3,510 (2 ditch samples combined)*	Upper Narizian (upper Eocene)	Open marine, near-shore bathyal
3,585 (ditch)*	Upper Narizian (upper Eocene)	Open marine, near-shore bathyal
3,800 (ditch)*	Upper Narizian (upper Eocene)	Open marine, near-shore bathyal
3,870 (ditch)*	Narizian (probably upper Eocene)	Open marine, near-shore bathyal
4,015 (ditch)*	Narizian (probably upper Eocene)	Open marine, near-shore bathyal
4,100 (ditch)*	Narizian (probably upper Eocene)	Open marine, near-shore bathyal
4,325 (ditch)*	Upper Narizian (upper Eocene)	Open marine, near-shore bathyal
4,545 (ditch)*	Indeterminate	Indeterminate
4,740 (ditch)*	Indeterminate	Indeterminate
4,970 (ditch)*	Indeterminate	Indeterminate
5,575 (ditch)*	Indeterminate	Indeterminate
6,115 (ditch)*	Indeterminate	Indeterminate
6,730 (ditch)*	Indeterminate	Indeterminate
7,400 (ditch)*	Indeterminate	Indeterminate
7,545 (ditch)*	Indeterminate	Indeterminate
7,620 (ditch)*	Indeterminate	Indeterminate
7,723 (core)*	Indeterminate	Probably neritic
7,733 (core)*	Tertiary	Probably neritic
7,780 (ditch)*	Indeterminate	Neritic?
8,021 (core)*	Narizian (probably upper Eocene)	Open marine, near-shore neritic
8,030 (core)*	Indeterminate	Neritic to upper bathyal
8,042 (core)*	Indeterminate	Neritic
8,213 (core)*	Indeterminate	Open marine
8,274 (core)*	Narizian (probably upper Eocene)	Open marine
8,308 (core)*	Narizian (probably upper Eocene)	Open marine
8,318 (core)*	Indeterminate	Open marine, bathyal
8,325 (core)*	Indeterminate	Open marine, outer neritic—bathyal
8,365 (core)*	Indeterminate	Open marine
8,451 (core)*	Indeterminate	Open marine

* Unprocessed sample.

** Previously picked faunal slide (from the R.E. Stewart collection housed at Portland State University).

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Subsurface correlations in the Mist area, Columbia County, Oregon

by Vernon C. Newton, Jr., Petroleum Engineer, Oregon Department of Geology and Mineral Industries

Exploration for oil and gas first began in the Mist area in 1946 when Texaco, Inc., put down its Clark and Wilson No. 6-1 well approximately 1¼ mi southeast of this small community (Figure 1). The project was part of a drive by industry to find new petroleum reserves after the end of World War II. Texaco encountered gas shows in sand of the uppermost Cowlitz Formation in Clark and Wilson No. 6-1, but the sands were found to be saturated with saltwater. Following Texaco's drilling, lands in Columbia County were leased by Superior Oil Company, Standard of California, and Mobil Oil Company over a 25-year period. No new holes, however, were put down until Reichhold Energy Corporation and its partners began exploring the area again in 1975.

After drilling three dry holes north of Mist, Reichhold and partners announced on May 1, 1979, that a commercial gas discovery had been made in its Columbia County No. 1—Redrill. The field is now undergoing development by Reichhold Energy Corporation, Northwest Natural Gas Company, and Diamond Shamrock Corporation. American Quasar Petroleum Company is drilling south of Mist to establish the southerly extension of the field.

The Texaco Clark and Wilson No. 6-1 well probably penetrated between 100 and 500 ft of rocks of the marine Keasey Formation before reaching Cowlitz-age rocks. The upper section of the Cowlitz Formation in this well is predominantly marine siltstone and mudstone. A silty sandstone body that was encountered between 1,900 and 2,300 ft has potential as a reservoir sand but at this location appears too silty and tight to produce a commercial quantity of gas. The main sand body lies between the depths of 3,000 and 3,600 ft. This sandstone interval appears to have good reservoir potential, based upon interpretation of the electric log and results of porosity and permeability tests performed on surface samples from the area and subsurface samples from two deep Texaco holes drilled in Columbia County (Figures 2 and 3 and Tables 1, 2, and 3). Volcanic rocks predominate between the depths of 4,500 and 7,500 ft in Clark and Wilson No. 6-1. These extrusive rocks consist of submarine lavas, volcanic breccias, and tuffs, with interbeds of Cowlitz-age siltstone, shale, and conglomerate. They were named the Tillamook Volcanic Series by W.C. Warren and others in 1945 and were tentatively assigned a wide age range extending from at least middle Eocene to upper

Eocene. The upper portion of the Tillamook Volcanic Series is equivalent to the Goble Volcanics, and both are interbedded with late Eocene marine sediments.

Sandstones in the lower portion of the Cowlitz Formation have potential for producing gas and possibly oil. In formation tests made in the Clark and Wilson No. 6-1 well at 7,880 to 8,000 ft, saltwater flowed to the surface, indicating that the sandstones have fairly good porosity and permeability. Mapping done by the Oregon Department of Geology and Mineral Industries in 1974-75 showed that it would be possible to locate a well up dip from the Clark and Wilson No. 6-1. Subse-

Figure 1. Texaco's Clark and Wilson No. 6-1 well, drilled in 1946-47 near Mist. (Photo courtesy Oregon Historical Society)



Table 1. Porosity—permeability of outcrop samples*

Formation	Location	Permeability (millidarcies)	Porosity (percent)	Sample description
Upper Cowlitz	NW ¼ sec. 31, T. 4 N., R. 5 W.	66	31.5	Sandstone; fine-grained, silty, micaceous, lithic arkose
Upper Cowlitz	SE ¼ sec. 5, T. 4 N., R. 5 W.	206	34.0	Sandstone; very fine-grained, silty, micaceous, lithic arkose
Upper Cowlitz	NE ¼ sec. 28, T. 4 N., R. 5 W.	46	30.9	Sandstone; very fine-grained, silty, micaceous, lithic arkose
Upper Cowlitz	NW ¼ sec. 23, T. 4 N., R. 5 W.	71	32.0	Sandstone; fine-grained, silty, micaceous, lithic arkose
Upper Cowlitz	NW ¼ sec. 23, T. 5 N., R. 6 W.	823	36.2	Sandstone; very fine-grained, silty, lithic arkose

* Source: Newton and Van Atta, 1976, p. 50-51.

Table 2. Texaco—Clark and Wilson No. 6-1
NE ¼ sec. 19, T. 6 N., R. 4 W.
Porosity—permeability of upper Eocene sandstone*

Formation	Depth (ft)	Permeability (millidarcies)	Porosity (percent)	Sample description
Upper Cowlitz	2,015	81.1	29.0	Sandstone; micaceous arkose
Upper Cowlitz	2,033	59.7	30.8	Sandstone; micaceous arkose
Upper Cowlitz	3,073	65.0	23.1	Sandstone; micaceous arkose
Upper Cowlitz	3,085	806.1	27.9	Sandstone; micaceous arkose
Upper Cowlitz	3,105	1,302.3	26.2	Sandstone; micaceous arkose
Upper Cowlitz	3,239	398.5	29.4	Sandstone; micaceous arkose
Upper Cowlitz	3,304	499.0	27.1	Sandstone; micaceous arkose
Lower Cowlitz	7,895-7,985	(Too friable—no recovery)		

* Source: Newton and Van Atta, 1976, p. 53-54.

Table 3. Texaco-Benson Clatskanie No. 1
NE ¼ sec. 36, T. 7 N., R. 4 W.
Porosity—permeability of upper Eocene sandstone*

Formation	Depth (ft)	Permeability (millidarcies)	Porosity (percent)	Sample description
Upper Cowlitz	2,124	82.0	24.5	Sandstone; arkose
Upper Cowlitz	2,629	106.0	27.2	Sandstone; arkose
Upper Cowlitz	2,648	8,500.0	25.7	Sandstone; arkose
Upper Cowlitz	2,653	722.0	25.1	Sandstone; arkose
Upper Cowlitz	2,699	17.0	27.9	Sandstone; arkose
Upper Cowlitz	2,815	440.0	21.5	Sandstone; arkose
Upper Cowlitz	5,120	0.6	13.7	Sandstone; silty arkose

* Source: Newton and Van Atta, 1976, p. 52.

MIST GAS FIELD SUBSURFACE CORRELATION

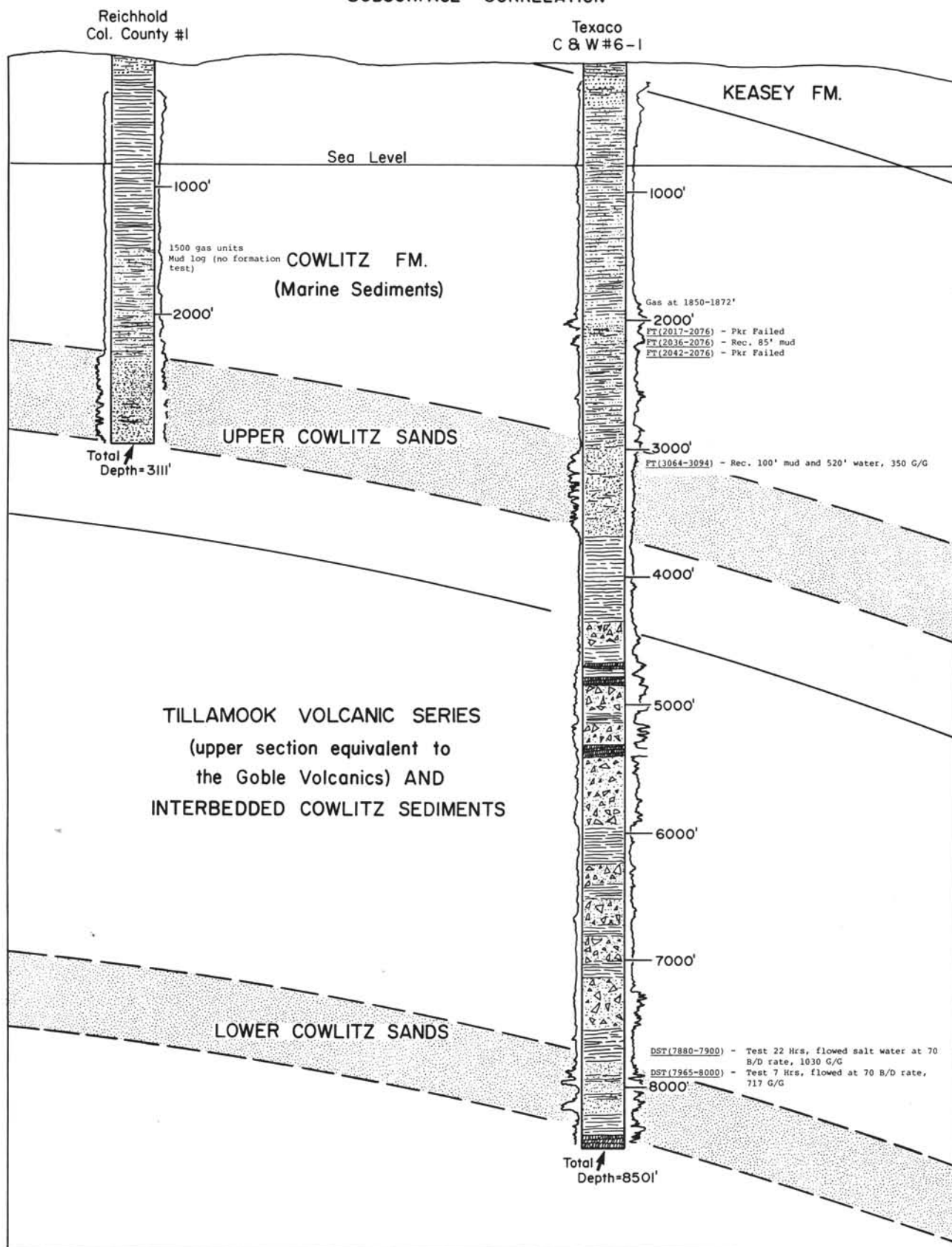


Figure 2. Subsurface correlations at Mist Gas Field.

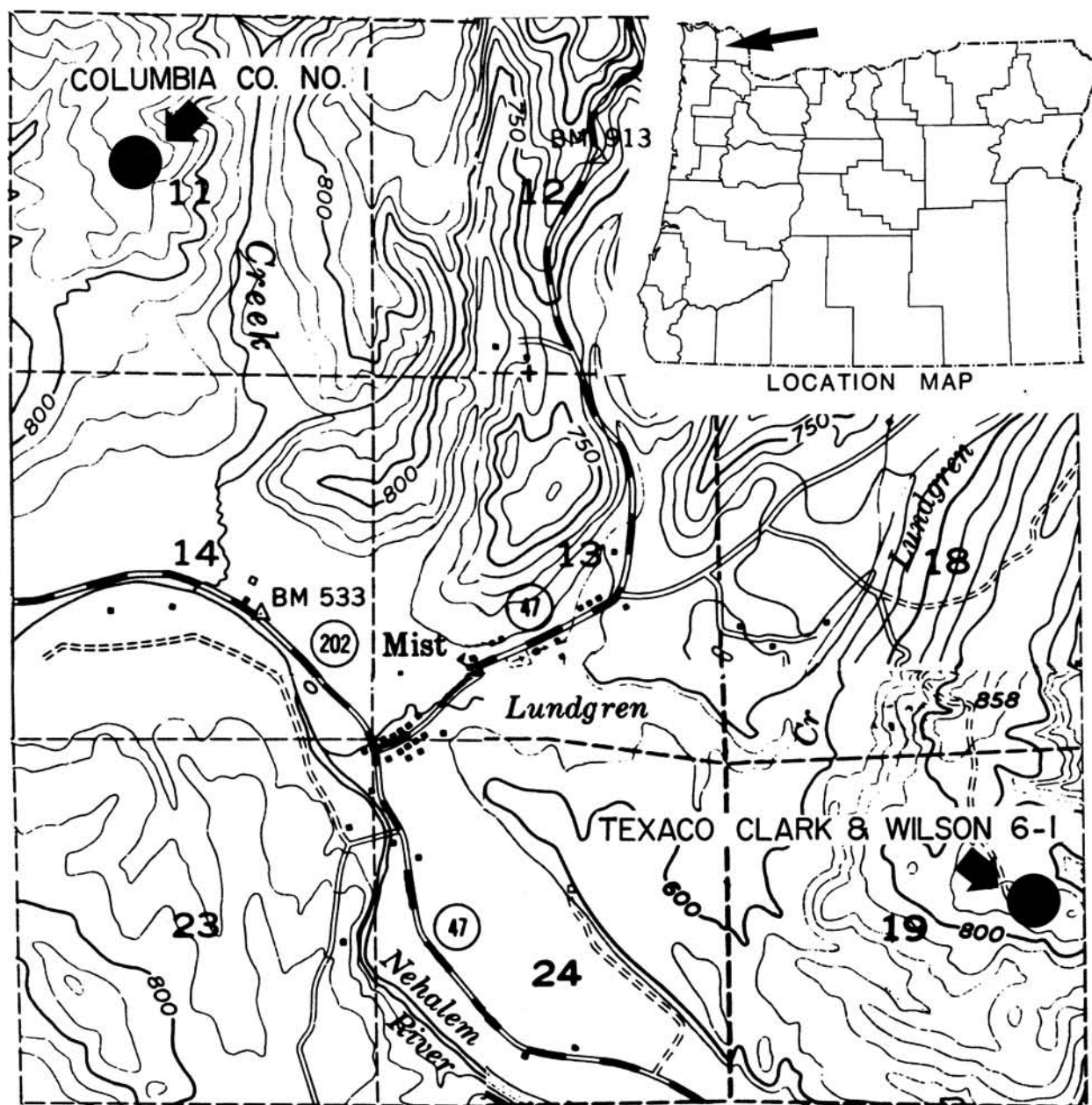


Figure 3. Location of Columbia County No. 1 and Texaco Clark and Wilson No. 6-1 Wells, Columbia County, Oregon.

quent drilling has proven this possibility. With gas production established in the upper Cowlitz sands, it will be very interesting to see whether production can also be found in the lower sands.

Under contract for the Oregon Department of Geology and Mineral Industries, D.R. McKeel, consulting paleontologist, reworked cores and drill cuttings from the Clark and Wilson No. 6-1 well for paleontological information in August 1979. Results of his studies are summarized in this issue of *Oregon Geology* and should be very helpful for anyone conducting investigations in northwestern Oregon. Detailed species lists will be made available in 1980 as part of an open-file report. Subsurface correlations shown in the

Department's earlier publications on this area agree substantially with McKeel's findings.

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Mist gas discovery guided by Wesley G. Bruer

The discovery of the State's first commercial gas field at Mist, Oregon, is credited to Wesley G. Bruer, consulting geologist for Reichhold Energy Corporation. After drilling seven dry holes in northwestern Oregon, Reichhold and its partners finally achieved success by re-entering the Columbia County No. 1 well and directionally drilling approximately 600 ft away from the surface location.

The Mist Gas Field was born on May 1, 1979, when, five minutes after opening the testing tool valve, gas reached the 2-in. flow line with a roar. At that instant, there was little doubt that the well was a commercial discovery. For Wesley Bruer, who had labored long and maintained faith in the area, and for the companies that had gambled a few million dollars on an idea, there came with the roar of gas a realization that the objective had finally been reached.

The discovery was mainly an Oregon project, with in-State industries as two of the financial partners: Reichhold Energy, a manufacturer of ammonium nitrate fertilizer, and Northwest Natural Gas Company, a supplier of gas. Wesley Bruer, consultant for Reichhold, was born and raised at St. Helens, Oregon, and was graduated from Oregon State University in 1950.

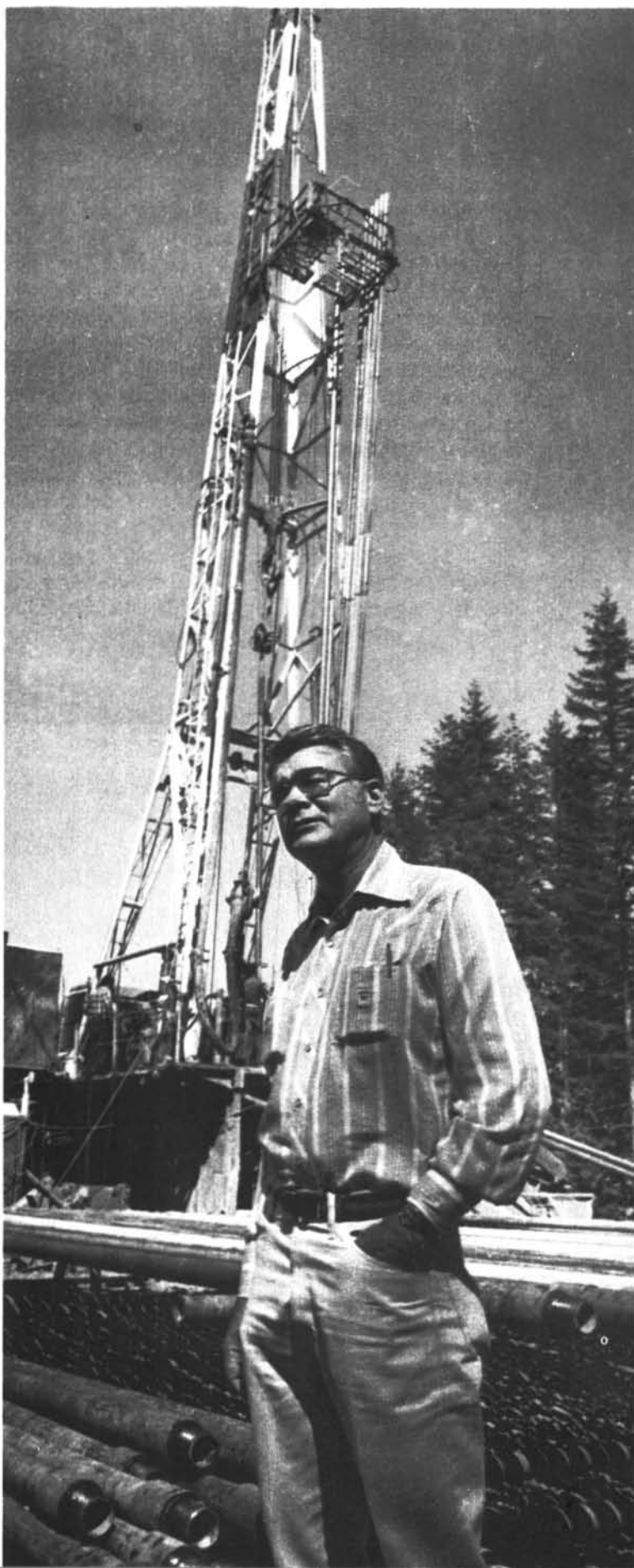
After graduation, Bruer investigated Oregon's oil and gas potential for Superior Oil Company. Since then, he has held many positions in geology, including California State Geologist from 1969 to 1973 and State Energy Coordinator in California during the early energy crisis years. He has had his own consulting practice for the past several years.

Development drilling by Reichhold is proceeding in the Mist Field, with a total of five producing wells and five dry holes drilled to date. American Quasar Petroleum has moved into the area since the discovery and has drilled two holes south of Mist and another hole south of Clatskanie. All three holes have been plugged. The Department has received applications for permission to drill at an additional twenty-four drill locations from Reichhold Energy Corporation and American Quasar Petroleum Company.

In honor of Bruer's persistent geologic efforts in the Mist area, Oregon's first natural gas pool was named the Bruer Pool during pipeline dedication ceremonies on Nov. 17, 1979.

Total production proved to date is approximately 17 million cu ft per day, an amount equal to 7 percent of Northwest Natural Gas Company's supply in western Oregon. □

Wesley G. Bruer (Photo courtesy Northwest Natural Gas)



Geologists in the Bureau of Land Management, Oregon

by Jack Feuer, Geologist, Oregon State Office, Bureau of Land Management, Portland, Oregon

The Bureau of Land Management (BLM) employs 17 geologists in Oregon, most of whom are located in district offices throughout the State. These geologists provide professional input for managing the Federally owned minerals on lands managed by BLM. This is about one-fourth of the land in Oregon (over 15 million acres). BLM also has a limited role concerning the minerals on National Forest land (also about one-fourth of Oregon land).

Until the mid-1960's, BLM geologists (or mining engineers) primarily did mining claim validity examinations for occupancy trespass and mineral patent applications. Other duties included conducting sales of common variety minerals, preparing mineral reports in support of realty and other programs, and determining Federal surface resource rights on mining claims. The role of geologists (and mining engineers) changed considerably with passage of the Federal Land Policy and Management Act of 1976 and other laws that mandated a broader and more active approach to land management than before. In addition to previous duties, BLM geologists are currently involved in energy leasing (oil, gas, and geothermal), land use planning, geologic hazard identification, environmental analyses, and even the wilderness review program.

While BLM geologists seldom do geologic mapping in the traditional sense, they often do original Mineral Resource Inventory (MRI) and mineral resource analysis work for Bureau land use and land management decision-making purposes. These Mineral Resource Inventories and Unit Resource Analyses (URA) are valuable area-wide or planning unit repositories of geologic and mineral-related information. These repositories are open to the public and helpful to those interested in such activities as mineral exploration, rockhounding, geologic mapping, land use planning, and scenic photography.

In its MRI effort, BLM is presently examining younger volcanic flows in eastern Oregon. These include Devil's Garden, Squaw Ridge, and Four Craters in Lake County; Diamond Craters in Harney County; and Jordan Craters, Saddle Butte Lava Field, and Bowden Crater in Malheur County. These MRI examinations will cover both mineral and geologic resources. Geologic resources include any special and distinctive features valuable for education or scientific purposes that land managers should know about. Mineral resources include known resources, mineral occurrences, and mineral potential. Known mineral resources

in these areas are mainly slab lava for decorative facing stone, but indicia for other resources and evidence of activity are also inventoried. Known or observed indicia for geothermal resources, no matter how subtle, are especially sought out.

Many of these areas have been given special designations such as established or proposed Research Natural Areas. Some are segregated from mineral entry due to proposed mineral withdrawals. Anyone interested in learning more about these or other areas should contact the local BLM District Office or the State Office where geologists and other resource specialists are available for public assistance. Names and addresses are as follows:

BAKER DISTRICT—523-6391
Gordon Staker, District Manager
P.O. Box 987
Baker, OR 97814
District Mining Engineer—Bob Ciesiel

BURNS DISTRICT—573-2071
L. Christian Vosler, District Manager
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District Geologist—George Brown

COOS BAY DISTRICT—269-5880
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P. O. Box 2965
Portland, OR 97208
State Office Geologists—Dave Sinclair 231-6911
Durga Rimal 231-6976
Jack Feuer 231-6975
Dean Delevan 231-6915
□

Archeological information requested

The State Historic Preservation Office, in cooperation with the Anthropology Department of the University of Oregon, maintains a file of archeological and historic sites in Oregon.

Acting State Archeologist Leland Gilson has asked that any geologists who discover archeological sites during field work report them to his office.

Address any archeological information to: Leland Gilson, Preservation Archeologist, State Historic Preservation Office, Parks and Recreation Branch, Department of Transportation, 525 Trade Street S.E., Salem, Oregon 97310. □

In memoriam: Fayette W. "Fay" Libbey, 1882-1979

The Oregon Department of Geology and Mineral Industries mourns the death of its second director, "Fay" W. Libbey, who passed away on November 2, 1979.

Fayette Wilmott Libbey was born in Macwahoc, Maine, and grew up in Bangor, Maine. He was graduated from the Massachusetts Institute of Technology in 1906 with a degree in mining engineering. He came to Oregon in 1935 as a geologist with the U.S. Army Corps of Engineers and became the Department's first mining engineer when this agency was created in 1937 by the Oregon Legislature. "Mr. Libbey," as he was usually called by the Department staff, served as director of the agency from 1944 until his retirement in 1954.



It was Libbey's insight and support for exploration that led to the discovery of large areas of ferruginous bauxite in northwestern Oregon. Under his directorship, the Department also investigated and produced publications on coal prospects in the Medford and Coos Bay areas, assessments of potential of the Oregon King Mine in Jefferson County and the Almeda Mine in Josephine County, and the early gold mining activities in Oregon. He received special honors upon his retirement from the Governor of Oregon and the Oregon section of the American Institute of Mining and Metallurgical Engineers. His service to the Department and the State of Oregon covered almost four decades. Visitors to the Department will find a very attractive copper display in the museum and numerous books in the library donated by "our Mr. Libbey." □

NEW OIL AND GAS DRILLING PERMITS

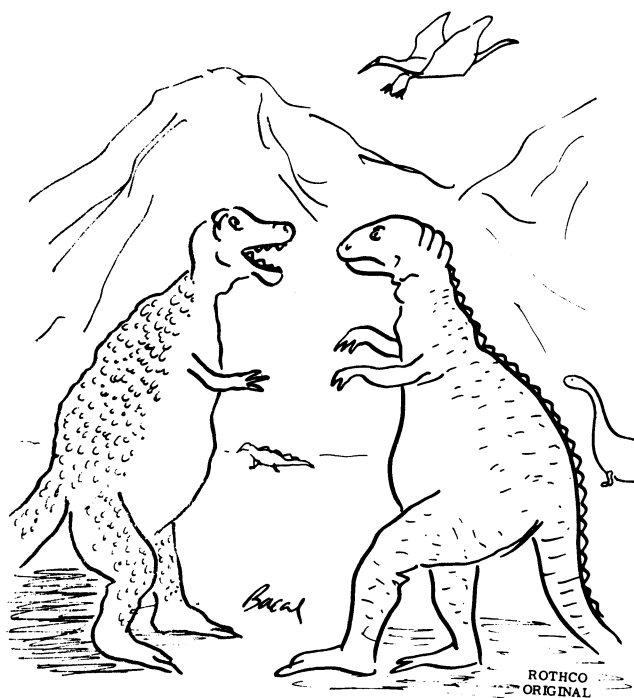
Permit no.	Date issued	Company	Lease name and county	Location
110	9-12-79	American Quasar Petroleum Co.	Well No. 24-11 (Columbia County)	NE ¼ NW ¼ sec. 24 T. 6 N., R. 5 W.
111	9-28-79	Reichhold Energy Corporation	Crown Zellerbach No. 3 (Columbia County)	SW ¼ SE ¼ sec. 6 T. 4 N., R. 3 W.
112	9-28-79	Reichhold Energy Corporation	Crown Zellerbach No. 4 (Columbia County)	SE ¼ NW ¼ sec. 36 T. 5 N., R. 4 W.
113	9-29-79	American Quasar Petroleum Co.	L. Fibre No. 36-41 (Columbia County)	NE ¼ NE ¼ sec. 36 T. 6 N., R. 5 W.
114	9-29-79	American Quasar Petroleum Co.	L. Fibre No. 31-21 (Columbia County)	NE ¼ NW ¼ sec. 31 T. 6 N., R. 4 W.
115	10-17-79	Reichhold Energy Corporation	Columbia County No. 12 (Columbia County)	NW ¼ NW ¼ sec. 14 T. 6 N., R. 5 W.
116	10-24-79	Oregon Natural Gas Development Co.	Crown Zellerbach No. 1 (Tillamook County)	SE ¼ NW ¼ sec. 13 T. 2 S., R. 10 W.
117	10-24-79	John Miller	John Stump No. 1 (Polk County)	SW ¼ NW ¼ sec. 26 T. 8 S., R. 5 W.
118	10-23-79	American Quasar Petroleum Co.	Crown Zellerbach No. 29-14 (Columbia County)	SW ¼ SW ¼ sec. 29 T. 6 N., R. 4 W.

Juan de Fuca Plate map published by Canadians

A relief map specifically designed as a base for geoscientists working in the Pacific Northwest has recently been published by the Canadian Department of Energy, Mines, and Resources. It is based on the region of the Juan de Fuca Plate and its zone of interaction with North America. The area covered is from the Snake River to the offshore ridge (116°W to 133°W) and from Cape Mendocino to the Queen Charlotte Islands (39°N to 53°N). Sea-floor relief is shown at 200 m intervals and topographic relief at 500 m intervals on a scale of 1:2,000,000.

The map developed in response to a demand for a single projection base which transcended the usual land-sea and Canada-United States borders and provided a focus for studies in a region with a clear tectonic unity. Cultural information (roads, railways, towns, etc.) has been omitted or reduced to a minimum, and the map is available in a three part set. JFP 1 is a full-color version using the International Map of World color scheme; JFP 2 is a black-white contour-only version with all nonrelief information suppressed; JFP 3 is a black-white plotting sheet showing only a degree grid, the coastline, and political boundaries.

The set is available at a cost of \$5.00 Canadian, including postage (check or money order payable to the Receiver General for Canada) from "Juan de Fuca Plate Map," Pacific Geoscience Centre, P.O. Box 6000, Sidney, B.C., Canada, V8L 4B2. □



"IS IT MY IMAGINATION, OR HAVE THE WINTERS
BEEN GETTING COLDER?"

Book review

by Ralph S. Mason, former State Geologist

THE MAGNIFICENT GATEWAY, by John Eliot Allen (1979, Timber Press, 144 pages, photos, maps, and tables). A comprehensive and useful study of the only visible cross-section through the entire length of the Cascade Range.

The author, who is an old hand at teaching geology, has incorporated, as a preface to the geologic story of the Columbia River Gorge, some most helpful information on geologic processes, terms, and map symbols. This material is included to prepare the layman for the detailed discussion that follows on how the Gorge was formed.

Although Allen has written his paperback book primarily for the tourist and interested lay person, he has, through the carefully documented trip logs, assembled a wealth of geologic information of interest to the professional as well. Since travelers through the Gorge move in both directions, two trip logs have been prepared, one covering the area from Portland to The Dalles, along the Oregon side, the other from The Dalles to Vancouver on the Washington side.

No study of the Columbia Gorge can be complete without an account of the catastrophic floods originating from the melting of the ice dams formed during Ice Age time in northern Idaho and western Montana. The cubic miles of water thus suddenly released carved and altered the topography of the Gorge in a matter of a few days.

Also included is information on early Man, trails, weather, and vegetation. Numerous photographs, maps, and charts round out the book. Unfortunately, there is no map of the area devastated by the catastrophic floods. All in all, however, Allen has done an excellent job of explaining how one of the region's prime scenic assets was formed. □

Volcano map available from NOAA

The National Oceanic and Atmospheric Administration has compiled a map locating the volcanoes that have erupted in the last 12,000 years. The 57-by-36 in. map lists some 700 volcanoes and also shows the locations of major earthquakes between 1963 and 1977.

The map is available for \$2.50 from NOAA, National Ocean Survey, Distribution Division, C44, Riverdale, Md. 20840. □

DOGAMI adds new staff member: Dennis L. Olmstead

For the past twenty-five years, drilling for oil, gas, and geothermal resources has been conducted on a very limited scale in Oregon. During the last two years, however, the situation has changed dramatically, thereby greatly increasing the regulatory workload for Vern Newton, the Department's only petroleum geologist. On October 22, therefore, the Department added another geologist, Dennis L. Olmstead, to its staff to help with the regulatory work in drilling for oil, gas, and geothermal resources.

Olmstead comes well prepared for his new responsibilities. A graduate of the State University of New York at Oneonta (B.S. in geology, 1969) and of the University of Washington (M.S. in oceanography, 1972), he began his professional career as field geologist for a soil engineering consultant in Sacramento, California. A year later, he joined the California Division of Oil and Gas as energy and mineral resource engineer in the Los Angeles Basin and the Sacramento Valley. This three-year appointment included regulatory responsibilities in testing and inspecting drilling rigs and issuing permits to drill, rework, and abandon wells. For another two years, Olmstead worked for the Division as assistant geothermal officer, regulating geothermal exploratory and development drilling in northern California. He spent the last eight months before joining DOGAMI as geologist for the California Division of Mines and Geology, participating in a low-temperature geothermal assessment program of the Federal and State Departments of Energy.

Although a native of the east coast, Olmstead feels he has come full circle: from his graduate days at the University of Washington via California back to the Northwest. And if he is not outdoors doing his work, you may still find him out there, in the mountains or along the streams, pursuing his hobbies of climbing, skiing, and whitewater boating. □



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