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OREGON RADIOACTIVE DISCOVERIES IN 1954 AND 1955

By
T. C. Matthews*

Many occurrences of radioactive minerals were located in the State during 1954 and 1955, but the only commercial production so far has been from the White King and Lucky Lass mines near Lakeview in Lake County. These two mines, about 1 mile apart, are under lease to the Lakeview Mining Company (Thornburg Bros.) who shipped three carloads of ore in 1955 to Salt Lake City, Utah. Development work is also being done on claims on the east flank of Steens Mountain in Harney County and in the Bear Creek area of Crook County. The occurrences in the Wallowa Mountains area shown on the index map represent only a few of the many reported.

Tables 1 and 2 present pertinent facts about the known radioactive discoveries in the State. Information for the tables was based on samples submitted to the offices of the Department or collected in the field by members of the Department staff. Additional information was furnished by the Atomic Energy Commission, Salt Lake City Exploration Branch, E. K. Thurlow, Chief. The index map shows the distribution of the occurrences. The numbers on the map correspond with those in the tables.

In Table 1, the name refers to either the owner or operator of the claim from which the sample was received or the person submitting the sample to the Department. The location is that which was furnished with the sample. The uranium minerals listed may represent only the dominant radioactive minerals present. "Radioactive blacks" include such minerals as betafite, brannerite, davidite, euxenite, fergusonite, and samarskite, which often occur in placer deposits. Host rocks and associated minerals are given if known. Unless otherwise indicated, the tests for U_3O_8 equivalent were made by members of the Department using either a radioassayer (AEC Type TM-6-B) or a scintillator (Precision Model 111-B). No samples have been included which read less than .02 percent U_3O_8 equivalent. Unless otherwise noted, chemical analyses for U_3O_8 were made by L. L. Hoagland, Assayer-Chemist with the Department. All available samples were tested with the short-wave ultraviolet lamp, and the color of the fluorescence, if any, is given. The presence of mercury was considered significant, as it may have bearing on the origin of the uranium mineralization. Mercury was determined by the Willemite screen - ultraviolet lamp method which can detect extremely small traces.

Table 2 gives the results of qualitative spectrographic analyses run on many of the samples. Since these analyses were made to assist in determining the radioactive minerals or rare earths present, many of the samples used were panned concentrates or hand-picked specimens.

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* Spectroscopist, State of Oregon Department of Geology and Mineral Industries.

Table 1.

Radioactive Occurrences in Oregon, 1954 - 1955

Map No.	Name	Location	Uranium Minerals	Host Rock and Associated Minerals	U_3O_8 Equiv.	U_3O_8 Chem. Analysis	Fluorescence	Mercury
BAKER COUNTY:								
1	Ernest Rogers Robinette, Ore.	Homestead mining district	Unknown	Black sands. Monazite, zircon	.03		Orange (zircon)	None
2*	J. W. Vermeesch Alicel, Ore.	Sec. 19 T. 11 S., R. 46 E.	Unknown	Travertine	.035		None	None
3*	Nobel Knight Baker, Ore.	Sec. 10 T. 9 S., R. 42 E.	Unknown	Pumicite	#.07	#.13	None	None
4	Sam Thompson Gold Beach, Ore.	Sec. 32 T. 8 S., R. 38 E.	Unknown	Black sand concentrate	.3		None	None
CROOK COUNTY:								
1*	Harley Dosser Redmond, Ore.	T. 16 S., R. 14 E. Powell Butte dist.	Unknown	Porphyritic rhyolite. Radioactivity highest along fractures.	.09	.105	None	Trace
2*	Charles Williams Lakeview, Ore.	Sec. 13 T. 18 S., R. 16 E. Bear Creek dist.	Autunite Novacekite	Rhyolite and tuff	.1	.22	Yellow-green	Trace
CURRY COUNTY:								
1	Bert Squire Grants Pass, Ore.	Sec. 23 T. 39 S., R. 11 W.	Autunite (?)	Fine-grained tuff	.2		Yellow-green	Trace
2	John Wimer Roseburg, Ore.	Sec. 16 T. 41 S., R. 13 W.	Black radio-active minerals	Black sand. Zircon	.14		Orange (zircon)	None
GRANT COUNTY:								
1*	Ray Summers John Day, Ore.	Sec. 12 T. 12 S., R. 33 E. Standard mine	Unknown	Schist. Calcite, chalcopyrite, pyrite	.07	.05	None	None
1+	Burt Hayes and K. J. Murray John Day, Ore.	Standard mine	Unknown	Chalcopyrite, pyrite, cobaltite, glaucodot, arsenopyrite, galena, bismuthinite, sphalerite, gold reported, calcite, quartz gangue.	#.069			
2	Paul Remaley Prairie City, Ore.	Sec. 14 T. 12 S., R. 33 E.	Unknown	Metavolcanics. Chalcopyrite, pyrite in vein	.02		None	None
HARNEY COUNTY:								
1*	Dewey Quier Burns, Ore.	Sec. 17 T. 34 S., R. 34 E. Pike Creek carnotite claim	Unknown	Tuff and rhyolite breccia	.4 .3	.372 .186	None None	Trace Trace
1+	same	same	Unknown	Unknown	#.47	#.373		
2	John Langrell, Jr. Denio, Ore.	Sec. 18 T. 40 S., R. 35 E.	Unknown	Schist. Chalcocite, malachite, azurite, quartz gangue	.02		None	None
3*	Harry and Don Alexander, Andrews, Ore.; Fred & Nellie Ladd, Seattle, Wash.; Miller Mining Co., Joseph, Ore.	Sec. 20 T. 34 S., R. 34 E.	Autunite	Fracture zones in rhyolite		.34 (private lab.)	Yellow-green	

*Property examined by State of Oregon Department of Geology and Mineral Industries.

+Property examined by Atomic Energy Commission, Salt Lake Exploration Branch.

#Analysis by Atomic Energy Commission.

Note: All analyses by State of Oregon Department of Geology and Mineral Industries unless otherwise indicated.

Table 1 (cont.)

Map No.	Name	Location	Uranium Minerals	Host Rock and Associated Minerals	U_3O_8 Equiv.	U_3O_8 Chem. Analysis	Fluorescence	Mercury
JACKSON COUNTY:								
1	George DeGroote Portland, Ore.	Little Applegate River south of Jacksonville	Unknown	Calcareous graphite schist	.02		None	None
2	Ervine House Shady Cove, Ore.	Near Trail	Unknown	Rhyolite breccia and tuff	.045		Yellow-green	None
3*	Vernon Ritchie, Norman Nelson Medford, Ore.	Sec. 27 T. 40 S., R. 1 E.	Euxenite-polycrase	Pegmatite	.10		None	None
4	Carl Love Milwaukie, Ore.	Sec. 19 T. 33 S., R. 1 W. Dawn Marie claim	Unknown	Volcanic tuff. Fluorescence along fractures.	.055		Green	None
4	Same	Same	Unknown	Rhyolite. Quartz gangue	#.07	#.072		
JOSEPHINE COUNTY:								
1	Unknown	Greenback mining district	Unknown	Diorite	.25		None	None
LAKE COUNTY:								
1*	John Roush, Don Tracy, Walter Lehman, Lakeview, Ore.	Sec. 30 T. 37 S., R. 19 E. White King mine	Autunite Novacekite	Opalized tuff and rhyolite. Realgar, orpiment, cinnabar, pyrite, stibnite	.42 .34	.548 .458	Yellow-green Yellow-green	Trace Trace
1+	Thornburg Bros., lessee, (Lakeview Mining Co.) Lakeview, Ore.	White King mine	Autunite Novacekite Meta-torbernite	Opalite. Realgar	#.21	#.309		
2*	Don Lindsey, Robert Adams, Claire Smith, L. F. Shelton, Lakeview, Ore.	Sec. 25 T. 37 S., R. 18 E. Lucky Lass mine	Autunite Novacekite	Tuff and agglomerate	.42	.557	Yellow-green	Trace
2+	Thornburg Bros., lessee, (Lakeview Mining Co.) Lakeview, Ore.	Lucky Lass mine	Autunite Novacekite	Iron oxide	#.37 #.44	#.464 #.674		
3*	Sam Lookholder Elmo Angele, Lakeview, Ore.	Sec. 13 T. 37 S., R. 18 E. Marty K claim	Autunite	Volcanic tuff, fault gouge	.3 .2	.383 .305	Yellow-green Yellow-green	Trace None
3+	Elmo Angele Lakeview, Ore.	Marty K claim	Autunite	Opalite. Cinnabar (?)	#.16			
4	Lewis A. Kaehn, Denver H. Drake, Don Becker, Ralph Russell, Gilchrist, Ore.	Sec. 6 T. 35 S., R. 18 E. Bald Butte claim	Unknown	Silicified tuff	.035		None	None
5*	J. W. Stott Grants Pass, Ore.	Sec. 33 T. 37 S., R. 18 E. Big Enough claim	Unknown	Carbonaceous argillite Carbonized wood in tuff	.035 .03		None None	None None
MALHEUR COUNTY:								
1*	Louis Hall Ontario, Ore.	T. 21 S., R. 42 E. Blue Moon #1 claim	Unknown	Limonite-stained sandstone	.03		Yellow	None
1	Same	Same	Unknown	Unknown	#.04			
2*	Jack Flock Dayton, Ore.	T. 21 S., R. 42 E.	Unknown	Opalite concretion in diatomite	.04		Yellow	None
3	S. B. Rasmussen LaGrande, Ore.	Malheur County	Unknown	Claylike material	#.05	#.062		

Table 1 (cont.)

Map No.	Name	Location	Uranium Minerals	Host Rock and Associated Minerals	U_3O_8 Equiv.	U_3O_8 Chem. Analysis	Fluorescence	Mercury
UNION COUNTY:								
1	Art Fisk Baker, Ore.	T. 5 S., R. 43 E.	Unknown	Copper sulphides, quartz gangue	.09	.111	None	None
2	Art Fisk Baker, Ore.	T. 5 S., R. 43 E.	Unknown	Silicified fault breccia. Quartz, magnetite, chlorite, iron minerals	.08	.102	Yellow-white	None
3	Scott Corbett, Jr. Portland, Ore.	T. 5 S., R. 43 E.	Unknown	Granite pegmatite	.06		None	None
4	Harry Peeples Prineville, Ore.	Sec. 32 T. 5 S., R. 43 E.	Black radio-active minerals	Granite. Quartz gangue	.15		None	None
5+	Miller Mining Co. E. R. Wells Joseph, Ore.	Secs. 23, 26 T. 5 S., R. 43 E. Tungs Ore claim	Unknown	Malachite, chalco-pyrite, bornite, quartz gangue	#.21 #.97	#.197 #.830		
WALLOWA COUNTY:								
1 *	William McCrady Portland, Ore.	Sec. 23 T. 4 S., R. 43 E. Lostine River dist.	Unknown	Bornite, malachite, azurite, quartz gangue	.02		None	None
2 *	H. R. Ahalt Lostine, Ore.	Sec. 21 T. 4 S., R. 43 E.	Black radio-active minerals	Pegmatite. Gold, silver, copper	.2		None	None
3	Edward Groh Portland, Ore.	Sec. 6 T. 4 S., R. 45 E.	Unknown	Mica schist	.08		None	None
4	Marvin Murray Enterprise, Ore	T. 4 S., R. 43 E.	Black radio-active minerals	Pegmatite	.15		None	None
WHEELER COUNTY:								
1	James Nelson Condon, Ore.	Near Spray	Unknown	Tuff	.02			
2	Edward Groh Portland, Ore.	Sec. 16 T. 11 S., R. 21 E. Near Sargent Butte	Unknown,	Rhyolite tuff	.02		None	None

Symbols for Elements in Table 2

Ag	Silver	Hf	Hafnium	Sb	Antimony
Al	Aluminum	K	Potassium	Si	Silicon
As	Arsenic	La	Lanthanum	Sn	Tin
B	Boron	Li	Lithium	Sr	Strontium
Ba	Barium	Mg	Magnesium	Th	Thorium
Be	Beryllium	Mn	Manganese	Ti	Titanium
Bi	Bismuth	Mo	Molybdenum	U	Uranium
Ca	Calcium	Na	Sodium	V	Vanadium
Ce	Cerium	Nb	(columbium) Niobium	W	(wolfram) Tungsten
Co	Cobalt	Nd	Neodymium	Y	Yttrium
Cr	Chromium	Ni	Nickel	Yb	Ytterbium
Cu	Copper	Pb	Lead	Zn	Zinc
Fe	Iron	Pr	Praseodymium	Zr	Zirconium

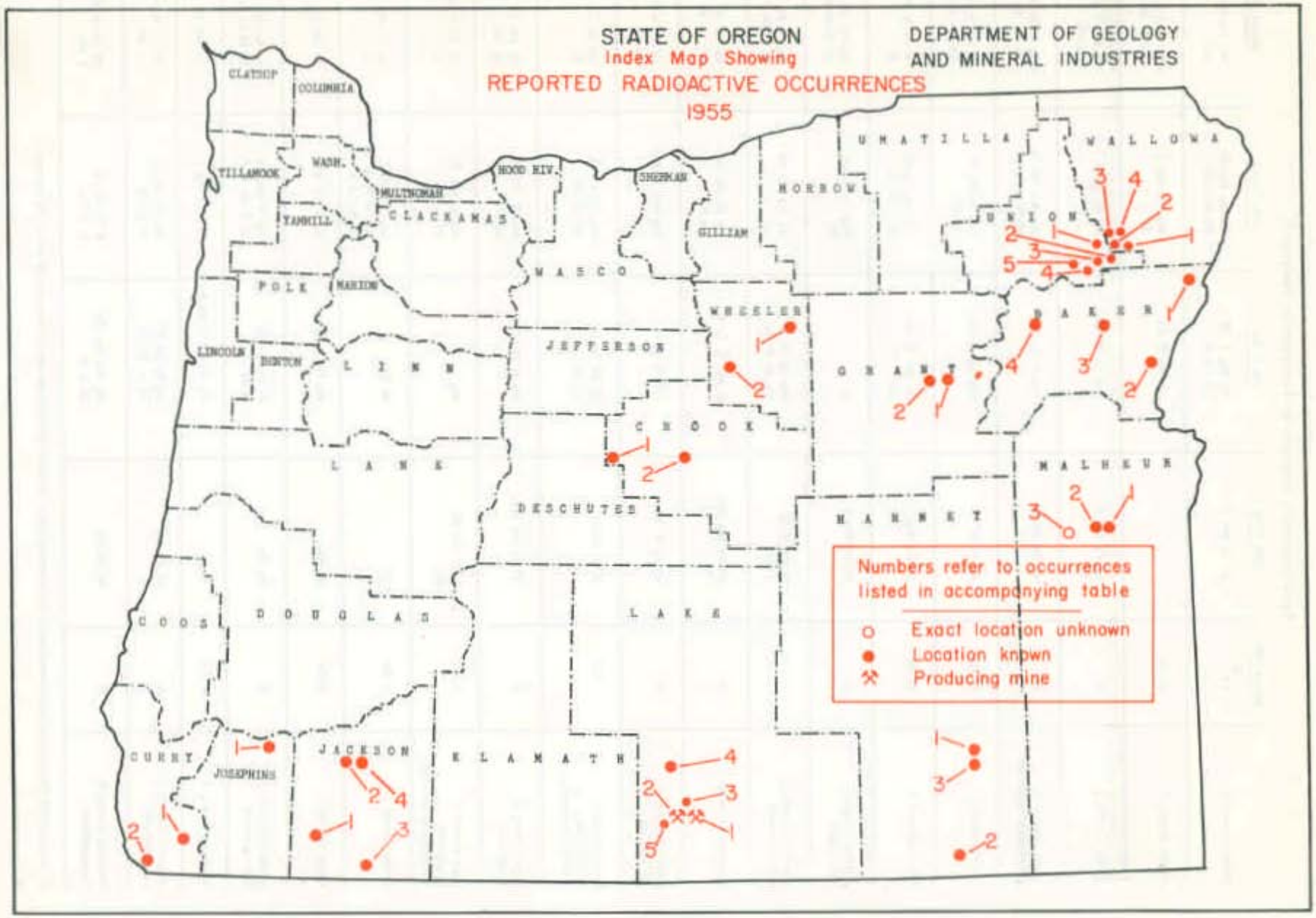
Table 2.

Spectrographic Analysis of Radioactive Samples [1/]

	Above 10%	10% - 1%	1% - .1%	.1% - .01%	Below .01%
Baker County 1	Fe [2/]	Zr Si Mn Ti	Al Mg K Hf Cb Ce Pr	La Ca Na Th Pb Sn Cr W V	Ni Cu Ba Sr Co
Crook County 1	Si Fe	- - - - -	Al Na K Zr	Mg Ca Mn Ti Pb U V	Cr Mo Cu Sr Ni Ba Be
Crook County 2	Si	Al Fe Na K Zr	Mg Ca Ti Mo U	Hf Pb Ba Sr	B Mn V Cu Co Ni
Curry County 1 (Fluorescent material)	Si	Al Fe Ca Zr	Na K Ti Zn	Mg Mn Hf Th Pb W U Cu Y	Cr V Ba Sr Co Ni Be Ag
Curry County 2	Si Fe	Al Ti Zr	Mg Ca K Mn	Na Hf Pb Th Sn Cr	V Cu Ba Sr Co Ni Ag
Grant County 1	Si Fe	Al Ca Mg	As Mn Ti Co Ce Y Pr	Yb Na La Pb K U Cr Cu	V Ba Sr Ni Zr
Harney County 1 Pike Creek	Si	Al Fe Na K	U	Mg Ca Ti Zr Pb	Mn Cr Mo V Cu Sr Ni Ba Be
Jackson County 3 (Concentrate)	- - -	Si Fe Ti Zr Y Nb	Mn Th Pb U Ce As Pr Ta	Al Ca Na Hf Sn	Mg V Be Co Bi Cr Ba Ni Cu
Josephine County 1	Si	Al Fe Mg Na	K Mn Ti Zr U	Ca Th Pb Cr Ce Y	Mo Ba W V Sr Ni Cu Be
Lake County 1 White King	Si	Al Fe K Na	Ca Pb Ba U	Mg Mn Ti Mo Sr	Zr Cr V Ni Cu Be
Lake County 1 White King (Yellow material)	- - -	Si Al Fe U	Th Pb Sn Zn Co As	Mg Ca Na K Mn Ti Bi	Ag Ba Cr V Cu
Lake County 2 Lucky Lass	Si	Al Fe Ca Na	Mg K Ti U	Mn Zr Pb V Ba Sr	Cr Mo Cu Ag Be Ni
Lake County 2 Lucky Lass (Fluorescent material)	- - -	Si U Ca Al Fe	Mg	Na K Mn Ti Ba Sr Co	Zr Cr V Cu Ni
Union County 1	Si Fe	Cu	Al Mo	Mg Ca Na K Mn Ti Pb V Ni U Bi Ce Y	Sn Cr Ag Ba Co
Union County 2	Si Fe	Al Mo	Mg Na K Mn Ti Cu	Ca Th V Ba U	Sr Ni Cr
Union County 4 (Concentrate)	Si	Fe Ca	Al Na Ti Th Pb U	Mg K Mn Zr Sn B Ce Y Pr	Hf Co Bi V Cu Ba Be Li Sr Ni
Wallowa County 1	Si Cu	Al Fe	Mg Ca Na K Mn Bi	Ti Pb V Ag	Cr Mo Ba Ni
Wallowa County 2 (Concentrate)	Si	Al Fe Ca	Mg K Mn Ti Ce La Pr Zr	Na Th Pb U W V Nd	Hf Cr Ba Sr Cu Ni
Wallowa County 4 (Concentrate)	Si	Al Fe Ca	Mg Na Mn Th Ce Y Pr	K Ti Zr Pb U V Cu	Hf Ba Sr Bi B Ni

1/ Mercury and fluorine are not determined by the spectrograph. Uranium and thorium are not determined below .05 percent.

2/ See bottom of opposite page for explanation of symbols.


STATE OF OREGON
Index Map Showing
REPORTED RADIOACTIVE OCCURRENCES
1955
DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
CLATSOP
COLUMBIA
TILLAMOOK
WASH.
MULTNOMAH
HOOD RIV.
SHERMAN
UMATILLA
WALLOWA
YAMHILL
CLACKAMAS
GILLIAM
MORROW
UNION
POLK
MARION
MASCO
WHEELER
BAKER
LINCOLN
BENTON
LINN
JEFFERSON
GRANT
CROOK
LANE
MALHEUR
DESCHUTES
HARNEY
Numbers refer to occurrences listed in accompanying table
Exact location unknown
Location known
Producing mine
COOS
DOUGLAS
LAKE
CURRY
JOSEPHINE
JACKSON
KLAMATH

PRELIMINARY REPORT ON THE LAKEVIEW URANIUM OCCURRENCES LAKE COUNTY, OREGON

By
Max Schafer*

Introduction

Oregon's first commercial uranium deposit, the White King mine, was found in June 1955 by Don Tracy and John Roush, Lakeview, Oregon. The initial discovery was made in sec. 30, T. 37 S., R. 19 E., approximately 14 miles northwest of Lakeview on the headwaters of Augur Creek. Shortly after public announcement of the discovery, the Lucky Lass uranium mine was located about 5000 feet northwest of the White King in sec. 25, T. 37S., R. 18E. In October both the White King and the Lucky Lass properties were leased by Lakeview Mining Company, an organization formed by Thornburg Bros. of Gunnison, Colorado. Three cars of ore from the two properties have been shipped to Salt Lake City, Utah, and extensive exploration has been done by the Lakeview Mining Company.

After announcement of the White King and Lucky Lass discoveries, intensive prospecting was done over much of Lake County. Although other areas of high radioactivity were found, to date no other commercial deposits are known to have been discovered.

General geology of mines area

The lowermost rock exposed in the area of the two mines is an opalized tuff of probable early Tertiary age. In general this rock is gray, brittle, and highly fractured. In places it is faintly banded. Presumably it was a siliceous tuff prior to alteration. The opalized tuff is exposed in the White King mine and crops out on Thomas Creek about 3 miles to the south. A white clayey tuff disconformably overlies the opalized tuff in the White King workings.

Above the opalized tuff and clayey tuff is a series of tuffs, basalt flows, and lake sediments. Basalt flows are prominent in this series mainly because they are more resistant to erosion than the loosely consolidated tuffs and sediments. The basalts are commonly black and vesicular with elongated vesicles as much as 1½ inches in length. Some flows are dense. The tuffs are intermediate to acidic in composition. The lake sediments are tuffaceous, medium to coarse grained, and locally stratified.

A thick sequence of volcanic rocks ranging from welded tuffs to rhyolites and dacites overlies the series of tuffs, basalts, and sediments. These rocks are light in color and often show flow banding. Extensive areas are covered by their float. Trauger (1950) has mapped this upper volcanic sequence as Oligocene (?) - Miocene age.

Structure

Faulting, especially block faulting, is a prominent feature throughout all of Lake County. Abert Rim approximately 20 miles to the northeast is one of the larger fault scarps of the region and testifies to the severity of the deformation. Faults of unknown displacement are common in the area. They influence stream drainage patterns and other topographic features. Folding could not definitely be determined near the area of the mines. Although some of the lake beds dip as much as 35°, tilting of fault blocks is thought to have been the cause.

* Geologist, State of Oregon Department of Geology and Mineral Industries.

Ore deposits

The areas showing the highest mineralization at the White King mine are confined to an opalized tuff and a weathered clayey tuff, which are the lowermost rocks exposed. Thickness of these beds has not been determined. Secondary uranium minerals coat fractures in the opalized tuff and are disseminated throughout the overlying unconsolidated clayey tuff. The chief uranium minerals have been tentatively identified as novacekite-saléeite, a group of hydrous uranium-magnesium arsenates and phosphates. Associated minerals are cinnabar, pyrite, stibnite, orpiment, and realgar. The mineral assemblage indicates a hydrothermal origin and formation at relatively low temperatures and pressures.

The White King deposit is located at the intersection of several major faults, one of which continues northwest through the Lucky Lass mine. It is believed that the faults were the main control for the mineralization.

The Lucky Lass deposit occurs in vesicular lavas stratigraphically above the mineralized tuffs found at the White King mine. The lavas are cut by many steeply dipping faults which constitute a shear zone. Intersection of the faults has cut up the deposit into blocks of ore having sharp boundaries with unmineralized rock. The country rock is dominantly a bleached vesicular lava. The uranium minerals are similar to those found at the White King property and they occur as fracture coatings, vesicle fillings, and disseminated in the clayey gouge. The only associated metal determined was a trace of mercury.

References

Waring, G. A., Geology and water resources of a portion of south-central Oregon: U.S. Geol. Survey Water-Supply Paper 220, 1908.

Trauger, F. D., Basic ground-water data in Lake County, Oregon; U.S. Geol. Survey Unpublished Records, 1950.

Weeks, A. D., and Thompson, M. E., Identification and occurrence of uranium and vanadium minerals from the Colorado Plateaus: U.S. Geol. Survey Bull. 1009-B, 1954.

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AIME ELECTS OFFICERS FOR 1956

At its December meeting the Oregon Section of the American Institute of Mining and Metallurgical Engineers elected the following officers for 1956: W. W. Wiltschko, Chairman; A. L. McGuinness, Vice Chairman; Lloyd Banning, Secretary-Treasurer; and Don Johnson and Earl T. Hayes, Directors. Chairman-elect Wiltschko is a metallurgist with the Vancouver plant of the Aluminum Company of America.

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COMMERCIAL URANIUM IN NEVADA DESCRIBED

"Uranium occurrence at the Moonlight mine, Humboldt County, Nevada," by Byron J. Sharp, published by the Atomic Energy Commission as RME-2032, pt. 1, describes a commercial uranium source in Kings River valley, 15 miles south of the Oregon border. Uranium minerals are autunite and torbernite occurring in a fault in rhyolite. Ore shipped assayed from 0.07 to 0.22 percent U_3O_8. The publication is available from Office of Technical Services, Dept. of Commerce, Washington 25, D. C. Price is 20 cents.

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