STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Building, Portland 1, Oregon
Telephone: Columbia 2161, Ext. 488

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CHROMITE - AN IMMEDIATE NATIONAL NEED

(Reprinted from January 1942 issue)

Editor's Note:

The Ore.-Bin has been asked to print a table showing chrome-iron ratios obtained from given percentages of Cr_2O_3 and Fe, and it seems proper at the same time to reprint some extracts from the January 1942 issue which was devoted to chromite. After more than 10 years, the ideas expressed then on the need for producing chromite seem just as important now.

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Tough, rugged, hard-bitten chrome steel will have a large share in winning the war. But chromite remaining in the ground will not make chrome steel. The chromite must be mined and transported long distances to steel mills or electric furnace plants in order to put it in fighting form. We cannot now depend on Turkey, South Africa, New Caledonia, and the Philippines to furnish the ore to us; we must produce it ourselves, and do it NOW. There isn't time for measured, long distance planning as to whether or not this and that are economic. This is an emergency and the essential thing is to get the chromite out.

The crying need is that those in authority should realize conditions under which lode chromite must be produced. They should realize that chromite occurs back in the mountains, far from a railroad; that access roads must be built; that the deposits vary in size over a wide range; that development is required; that encouragement must be given the prospector, for he, not the engineer for large operating companies, finds the ore; that the small operator has no capital for developing and mining his ore; and that he usually cannot prepay freight to a government stockpile, the location of which he does not know. Probably the most important of all the unique conditions governing production from these lenticular deposits - sometimes small discontinuous and remote - is the necessity of setting up machinery for buying ore in small lots. Only by providing such a market will maximum production be obtained.

Action is necessary if chromite is needed - and we believe it is. Delay will be translated into American lives lost. A rattlesnake doesn't wait for you to find a club of just the right size, or remain coiled without striking so that you may take some practice swings before deciding on the most effective method and posture for delivering the lethal blow. True, a rattlesnake usually gives some warning before it strikes; and in this regard it is one up on the enemies we are fighting now.

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How and Where Can Chromite be Found in Oregon

Chromite is one of the few ore minerals which only occurs in certain very definite and easily recognizable types of rock. This means that unless one is prospecting in a region where these rocks occur, there is absolutely no chance of finding chromite deposits; and it therefore means that prospecting for chromite in Oregon is considerably simplified because regions of chromite-bearing rock are fairly well known and well defined.

Table for Finding Chrome-Iron Ratios Given Percentages of Cr_2O_3 (Chromium Oxide) and Fe (Iron)

Cr_2O_3 Percent	Fe (iron) percent below															
56	10.9	11.2	11.6	11.9	12.3	12.7	13.2	13.6	14.1	14.7	15.3	15.9	16.6	17.4	18.2	19.1
55	10.7	11.0	11.4	11.7	12.1	12.5	13.0	13.4	13.9	14.4	15.0	15.7	16.4	17.1	17.9	18.8
54	10.5	10.8	11.2	11.5	11.9	12.3	12.7	13.2	13.6	14.2	14.7	15.4	16.0	16.8	17.6	18.4
53	10.3	10.6	10.9	11.3	11.6	12.0	12.4	12.9	13.4	13.9	14.4	15.1	15.7	16.4	17.2	18.0
52	10.1	10.4	10.7	11.1	11.5	11.8	12.2	12.7	13.2	13.7	14.2	14.8	15.5	16.2	16.9	17.7
51	9.9	10.2	10.5	10.9	11.2	11.6	12.0	12.5	12.9	13.4	13.9	14.5	15.1	15.8	16.6	17.4
50	9.7	10.0	10.3	10.6	11.0	11.4	11.7	12.2	12.6	13.1	13.6	14.2	14.8	15.5	16.2	17.0
49	9.5	9.8	10.1	10.4	10.7	11.1	11.5	11.9	12.4	12.9	13.4	13.9	14.5	15.2	15.9	16.7
48	9.3	9.6	9.9	10.2	10.5	10.9	11.3	11.7	12.1	12.6	13.1	13.6	14.2	14.9	15.6	16.4
47	9.1	9.4	9.7	10.0	10.3	10.6	11.0	11.4	11.8	12.3	12.8	13.3	13.9	14.5	15.2	16.0
46	8.9	9.2	9.5	9.8	10.1	10.5	10.7	11.2	11.6	12.1	12.5	13.1	13.6	14.3	14.9	15.7
45	8.7	9.0	9.3	9.6	9.9	10.2	10.6	11.0	11.4	11.9	12.3	12.8	13.4	14.0	14.6	15.4
44	8.5	8.8	9.2	9.4	9.6	10.0	10.3	10.7	11.1	11.5	12.0	12.5	13.0	13.6	14.3	15.0
43	8.4	8.6	8.9	9.1	9.5	9.8	10.1	10.5	10.9	11.3	11.7	12.2	12.8	13.4	14.0	14.7
42	8.2	8.4	8.7	8.9	9.2	9.6	9.9	10.2	10.6	11.0	11.4	11.9	12.5	13.1	13.7	14.3
	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0
							Chrome-iron ratio									

Example: To find chrome-iron ratio of ore assaying 46 percent Cr_2O_3 and 13.0 percent Fe. On horizontal line opposite 46 percent Cr_2O_3 find 13.0. At bottom of this column find 2.4, the chrome-iron ratio.

Note: This table gives approximate chrome-iron ratios. If it is necessary to have an exact ratio, multiply the percentage of Cr_2O_3 by 0.684 and divide by the percentage of iron, as for 46 percent Cr_2O_3 and 13 percent Fe, $\frac{46 \times 0.684}{13} = 2.42$.

If FeO (iron oxide) is reported in an assay of Fe, multiply the percentage of FeO by 0.777 to obtain Fe.

Chromite occurs only in serpentine, a dark green to brown, highly fractured, greasy-lustered rock, made up largely of iron and magnesium-bearing silicates, and in peridotite or "buckskin rock" (from which the serpentine is derived). Peridotite is light tan or reddish-tan on its weathered surface and dark green upon a broken surface; it usually contains small platy crystals of enstatite which stick out on the weathered surface to form rough knobs. When this "buckskin rock" lacks the crystals of enstatite and is uniform and fine-grained, it is known as "dunite." In several parts of the State chromite deposits are found surrounded by dunite areas, which in turn lie within peridotite areas. Consequently, the prospector, in certain parts of the State, looks first for peridotite, then for dunite areas in the peridotite.

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Chromite is sought for by its "float." These hard, loose pieces of ore weather out of the solid rock and work their way down the hillside perhaps into a stream bed. Therefore, the prospector searches, first, for float, and then attempts to follow the float up to its source. It is suggested that the best chances of finding new chrome deposits are in seeking extensions of known chrome deposits or zones.

The chrome-bearing areas in Oregon are first, southwestern Oregon, particularly the western part of Josephine County, Curry County, and southern Coos County. It is also known to occur in parts of southern Douglas County and Jackson County. In this part of the State, the rocks in which chromite may be found occur in bands from a few hundred yards to ten miles in width and from a half mile to thirty miles in length. These bands nearly always run in a north-south direction, usually a little bit east of north. They are easily recognized by the fact that the only plant which flourishes on them is the scrub pine. Even buck brush, chaparral, and salal will avoid areas of serpentine or peridotite so that when open prairies of grass or bare yellow rock studded with pine are found, it is fairly certain that serpentine or peridotite underlies them. In southwestern Oregon, the largest chromite deposits seem to occur in the bands running from Briggs Creek on the Lower Illinois River, northwest of Selma, south and west into California. Another band lies farther west of this one, and also contains some very large deposits.

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In central Oregon, chromite-bearing rocks are found in the central part of Grant County, south of the John Day River, just east and west of Canyon City. This area is outlined on a map published in U.S. Geological Survey Bulletin 922-D, and also in Bulletin 9 - "Chromite in Oregon" - by the Department. In the eastern part of the State, chromite occurs in several small areas; one of them is on Conner Creek, six miles northwest of the Snake River; another is on Willow Creek, ten miles east of Malheur; another just west of Sumpter, (see the geologic map of the Sumpter quadrangle, published by this Department, for the serpentine areas in which chromite might occur in this region); and another is near Bull Run Creek, southwest of Unity, Oregon. It is possible that other small patches of chromite-bearing rocks may be located in other areas, but it is not probable.

Along the coast of southern Oregon, the present beaches, as well as old beaches formed thousands of years ago and uplifted so that they now may stand several miles back from the present coastline, frequently contain lenses of "black sand" which, in Curry and Coos counties, contain appreciable amounts of chromite. These black chromite sands are derived from the wearing down of the rocks in the chromite-bearing regions drained by the Illinois, Rogue, and other streams, and the concentration of these heavy minerals is effected by the selective "panning" action of the waves

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CHROMITE CONCENTRATING MILLS IN OREGON

	Name	Location	Address
* 1.	Bowers	Galice Creek	Medford
2.	G.M.C.	Eagle Point	Eagle Point
* 3.	Rice	French Flat	Cave Junction
4.	Foster Ernest (Under construction)	Illinois River	Grants Pass
5.	Southwest Mines, Inc. Dale H. Franklin, Pres.	Wilderville	Medford
* 6.	Bristol-Baker	Sourdough Mine	Grants Pass
* 7.	Ashland Mining Company	Ashland	Ashland
8.	Strategic Mineral Corporation	Galice Creek	Galice
* 9.	Littell & McKee	Grants Pass	Grants Pass
10.	Hayes, J. S.	Rancherie Creek	Tillamook
11.	Bowser (Sold to R. E. McCaleb)	Peck Mine	Selma
*12.	Coast Minerals Co., Ltd. (Chromite sand is by-product and stockpiled)	Cut Creek	Randolph
13.	Freeman & Twombly	Sourdough Flat	Cave Junction
14.	Birdseye Creek Mill	Birdseye Creek	Rogue River
*15.	King, Franklin & Elmo	Dailey Creek	Grants Pass
*16.	Hayes, Bert (Sold to Art Newman)	Dixie Creek	John Day
*17.	Curzon (Tri-County Mining & Concentrating Co.)	John Day	John Day

*Active as of November 1, 1952.

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NEW MINING OPERATION NEAR DOUGLAS-JACKSON COUNTY LINE

The Grants Pass Bulletin, October 30, 1952, reports that Chester Flory, Harry Howren, and George M. Bronish, Glendale, Oregon, will start mining chrome near the Liberty asbestos property in northern Jackson County where white tremolite asbestos was mined during World War II. It is reported that both chrome and asbestos will be mined and that chrome will be shipped to the government purchasing depot at Grants Pass.

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RASMUSSEN LEAVES U.S. BUREAU OF MINES

Robert T. C. Rasmussen, metallurgist of the U.S. Bureau of Mines Electrodevelopment Laboratory, Albany, Oregon, has resigned to accept a position with Quebec Metallurgical Industries, Ltd., Ottawa, Ontario, Canada. While at Albany, Mr. Rasmussen specialized in smelting processes research including development of methods for making manganese-silicon alloy from manganese silicate minerals, aluminum-silicon alloys from high alumina clays, and ferronickel from nickel silicate ores at Nickel Mountain, Douglas County, Oregon.

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DR. ETHEL SANBORN - AN APPRECIATION

By
Ira S. Allison

Dr. Ethel Ida Sanborn, professor emeritus of botany and paleobotany at Oregon State College, died at Vancouver, Washington, October 31, 1952. She was graduated from South Dakota State College with a B. S. degree in 1903, received B. A. and M. A. degrees from the University of South Dakota in 1904 and 1907, and her Ph.D. degree from Stanford University in 1927.

Her life work was teaching and research. She taught botany at the University of Oregon from 1914 to 1932 and at Oregon State College from 1932 to 1948 when she was retired. Her publications in botany included studies mostly of algae, mosses, and liverworts. Her monographs on Hepaticae and Anthocerotes of western Oregon, on the moss flora of Willamette Valley (with Clara J. Chapman), and on the marine algae of the Coos Bay-Arago region (with Maxwell S. Doty) deserve special mention.

She early became interested in the fossil leaves exposed in the highway cut near Goshen, Lane County, Oregon, and in 1933 as joint author with Ralph Chaney of the University of California helped to prepare a monograph on the Goshen flora. This publication describes specimens belonging to 49 species (of which all but 5 species are new) based on about 1,000 specimens. The original plants were 2/3 shrubs, 1/5 trees, and 1/7 vines (lianas). These thick-leaved plants have their modern equivalents in Mexico, Central America, and other tropical areas. So it was inferred that the Goshen plants grew along streams in savannas associated with tropical or warm-temperate rain forests, when the Goshen area had a mean annual temperature of about 70° F. and a rainfall of about 70 inches or more, as compared with a temperature of about 62° F. and rainfall of 40 inches today. The deposits were thought to be upper Eocene or possibly lower Oligocene in age.

In 1937 Dr. Sanborn issued a similar study of the Comstock flora of middle Eocene age. This publication describes specimens from 25 species of dicotyledonous plants together with Equisetum and 4 species of ferns. Ten of the species are new to science. It is interesting that Cinnamomum makes up one-fourth of the flora and Magnolia one-tenth. About four-fifths of the species have tropical affinities; the others have temperate climate equivalents. Dr. Sanborn concluded that the Comstock flora indicated a warm moist temperate to subtropical climate.

In 1947 she described the Scio flora of upper Oligocene or lower Miocene age from Franklin Butte, Linn County. This flora of 1184 specimens includes 16 species, of which 7 are new. About three-fourths of the leaves are Prunus franklinensis, a cherry tree of Oriental affinity. Other plants are Equisetum stems, a fern, sequoia, willow, poplar, sycamore, basswood, huckleberry, and other genera characteristic of middle latitudes. The assemblage indicates a warm temperate climate in a moist coastal environment. Thus the Scio flora is intermediate between the Goshen and Comstock floras and that of the present, and illustrates the progressive change in the Tertiary succession of plants in western Oregon.

She also collected fossil leaves along Branch Creek near Pilot Rock, in eastern Oregon; at Crabtree Creek, Linn County; at the Molalla locality, Clackamas County; and elsewhere. The Branch Creek material resembles the fossil plants from the Clarno formation of central Oregon. Her studies of these florules were not complete and have not been published.

She was a member of many societies, including Sigma Xi, Phi Beta Kappa, Oregon Academy of Science, Pi Lambda Theta, Delta Kappa Gamma, A.A.U.W., D.A.R., and Alpha Xi Delta sorority.

As a teacher Dr. Sanborn was very successful because of her great interest in students and her unending patience with them. As a scientist and researcher her work likewise was

of a very high order. In recognition of her work the Oregon Academy of Science at its annual meeting on February 23, 1952, awarded her a Citation of Merit. Geologists owe to her a special debt of gratitude for her contributions to the paleobotany of Oregon.

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1941 (with Clara J. Chapman) Moss flora of the Willamette Valley, Oregon. Oregon State College, Oregon State Monographs, Studies in botany, no. 4, 72 p.

1944/47 (with Maxwell S. Doty) Marine algae of the Coos Bay-Arago region of Oregon. Oregon State College, Oregon State Monographs, Studies in botany, no. 8, 66 p.

1947 The Scio flora of western Oregon. Oregon State College, Oregon State Monographs, Studies in geology, no. 4, 47 p., 9 pl.

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VOLCANIC CINDERS PRODUCED

Deep red volcanic cinder chunks several feet in diameter are being shipped to Portland from Tetherow Butte in Deschutes County. Don E. Hurrle, Hermiston, and M. E. Roberts, Portland, are partners in the operation which is located in sec. 29, T. 14 S., R. 13 E., about 4 miles north of Redmond, Deschutes County, Oregon. The rough blocks are sold for wall construction and for use in rock gardens. They are very porous and have a bulk specific gravity of 1.21. The blocks can be shaped easily with simple tools.

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TWO LETTERS WHICH REFER TO THE SEPTEMBER 1952 ORE.-BIN ARTICLE "CONTRAVENING THE MINING LAWS"

United States
Department of the Interior
Bureau of Land Management
Washington 25, D.C.

October 29, 1952

My dear Mr. Libbey:

Mr. Bell, our Regional Administrator in Portland, has sent me a copy of The Ore.-Bin for September with your article about the Sunset article on how people could obtain homesites or cabin sites by use of the mining laws.

We have written the editor of Sunset explaining the errors in his statement. He has agreed to have an article prepared by one of his writers in collaboration with our San Francisco office, analyzing the matter further and correcting misimpressions from his former article. It seemed to me unnecessary and poor taste in sending out the reprint of the article to take issue with it. I do not hesitate to repeat my statement in that letter of transmittal that this is the most explicit published statement of a widespread attitude that I have ever seen. It is true that use of the mining laws in this way is contrary to the spirit and frequently to the letter of the mining laws, but it is also true that this is the way in which the mining laws are often used in practice, particularly by non-mining people.

It is true that if the Bureau had sufficient personnel we could investigate all mining claims and declare invalid those which were in fact invalid. Aside from the fact that we do not now have such funds it would be a large and unreasonable burden on the general public to pay for the costs of such investigations. Moreover, such investigations would necessarily have to consider all mining claims and I feel sure that the first people to object would be the mining industry themselves since many thousands of claims located by mining people are as invalid as many of the claims located by others. We certainly do not condone mis-use of the mining laws but we believe that any open-minded person who looks at all the facts will come to the conclusion that there are some shortcomings in the law.

Sincerely yours,
/s/ Marion Clawson
Director

Sunset Magazine
Lane Publishing Co., Menlo Park, California

October 30, 1952

Dear Mr. Libbey:

We have been in correspondence with the Bureau of Land Management, National Park Service, and the Forest Service in regard to an article that would correct the errors contained in the cabin article.

One suggestion is that we give particular attention to the constructive possibilities of the Small Tract Act as a means of aiding those people who in

the past have settled and built on invalid mining claims.

In your opinion would such an article bring out the points that need covering?

Sincerely,
/s/ Walter L. Doty
Editor

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HOMESITES AVAILABLE*

The federal government, through the Bureau of Land Management, is selling small tracts of the public lands, not exceeding five acres in extent, to qualified persons. Under the Small Tract Act of 1938, the Bureau is authorized to dispose of parcels of land scattered through the thirteen western states, and in Alaska, Florida, Louisiana, Mississippi, and Wisconsin.

The Small-Tract law allows occupancy and use of land classified as a home, cabin, camp, health, convalescent, recreational, or business site. After full compliance with the law and regulations, sale may be authorized to any person who is a head of a family or 21 years old and a citizen of the United States or who has filed declaration of intention to become a citizen.

A field examination is made by an officer of the Bureau and his report and recommendations are carefully considered and analyzed to determine whether the vacant public lands in the area may be classified for lease and disposal under the Small-Tract law.

The filing fee on each application is $10, returnable if lease is denied. In addition a $15 advance rental for a 3-year residence lease and $100 for a 5-year home and business lease is required.

Further information may be obtained from the Bureau of Land Management, Swan Island Station, Portland, Oregon.

*Abstracted from "How to Acquire a Small Tract" from Our Public Lands published by the Bureau of Land Management, October 1952.

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NEW MANGANESE ORE DEVELOPED IN BAKER COUNTY, OREGON

The Baker Record Courier of October 30, 1952, reports that Fred Ranes and Henry Spivey have mined manganese ore near Whitney, Baker County, assaying 34.45 percent manganese and are stockpiling it preparatory to shipment. It is reported that the Ray-O-Vac Company will use all the ore that this deposit can produce. The Ray-O-Vac Company, with plant in Salem, Oregon, is making manganese oxide for use in dry batteries.

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HANNA DEVELOPMENT COMPANY GETS TAX AMORTIZATION

The production of ferronickel from the nickel ore deposit near Riddle has moved a step closer to reality with the announcement (Oregonian, November 14, 1952) that DPA has certified a rapid tax amortization on the proposed $3,600,000 operation. Hanna Development Company, a subsidiary of the M. A. Hanna Company of Cleveland, Ohio, has been investigating the low-grade nickel-silicate ore body on Nickel Mountain for several years. The deposit represents the largest known body of nickel ore in the United States. Development has been hampered in the past by difficulty in treating the nickel-silicate mineral garnierite.

Construction of a proposed electric furnace, probably near Riddle, Douglas County, Oregon, would supply ferronickel which is used in alloying steels necessary for national defense and other purposes. The only domestic production of nickel comes from copper refining and