

GEOMORPHOLOGY OF THE OREGON CONTINENTAL TERRACE
SOUTH OF COOS BAY

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Introduction

The continental terrace consists of the continental shelf, extending from the shoreline to the first major increase of slope to greater depths, and the continental slope, extending from the outer edge of the continental shelf to the decrease of slope angle which marks the edge of the abyssal plain. Off the coast of Oregon the continental terrace varies in width from 35 nautical miles* off Cape Blanco to approximately 60 miles off Astoria. Variations in the width of the continental shelf and continental slope can be seen in Figure 1. The boundary between the shelf and the slope generally occurs in water 80 to 100 fathoms** deep; the edge of the abyssal plain, in water 1,500 to 1,700 fathoms deep. Characteristically, the continental shelf off the Oregon coast is narrower, has its outer edge in deeper water, and has a steeper angle of slope than the continental shelf in most parts of the world. The continental slope off Oregon is not as steep as the continental slope in most other parts of the world.

Three bathymetric charts of the continental shelf and slope off the Oregon coast have been prepared from unpublished soundings of the U.S. Coast and Geodetic Survey and from depth records of the Department of Oceanography, Oregon State University. The first of the charts, for the area off the central coast of Oregon (43°30'N. to 45°00'N.), was published and described in The ORE BIN for May 1962 (Byrne, 1962). A chart for the area south of Coos Bay (43°30'N.) to the Oregon-California border (42°00'N.) is presented in this article, along with a discussion of

* One nautical mile equals approximately one minute of arc of a great circle: 6,076.115 feet, officially. Throughout this report distances are expressed in nautical miles.

** One fathom equals 6 feet.

some of the geomorphic features indicated. The third chart, for the area off northern Oregon, will be presented in a future issue of *The ORE BIN*.

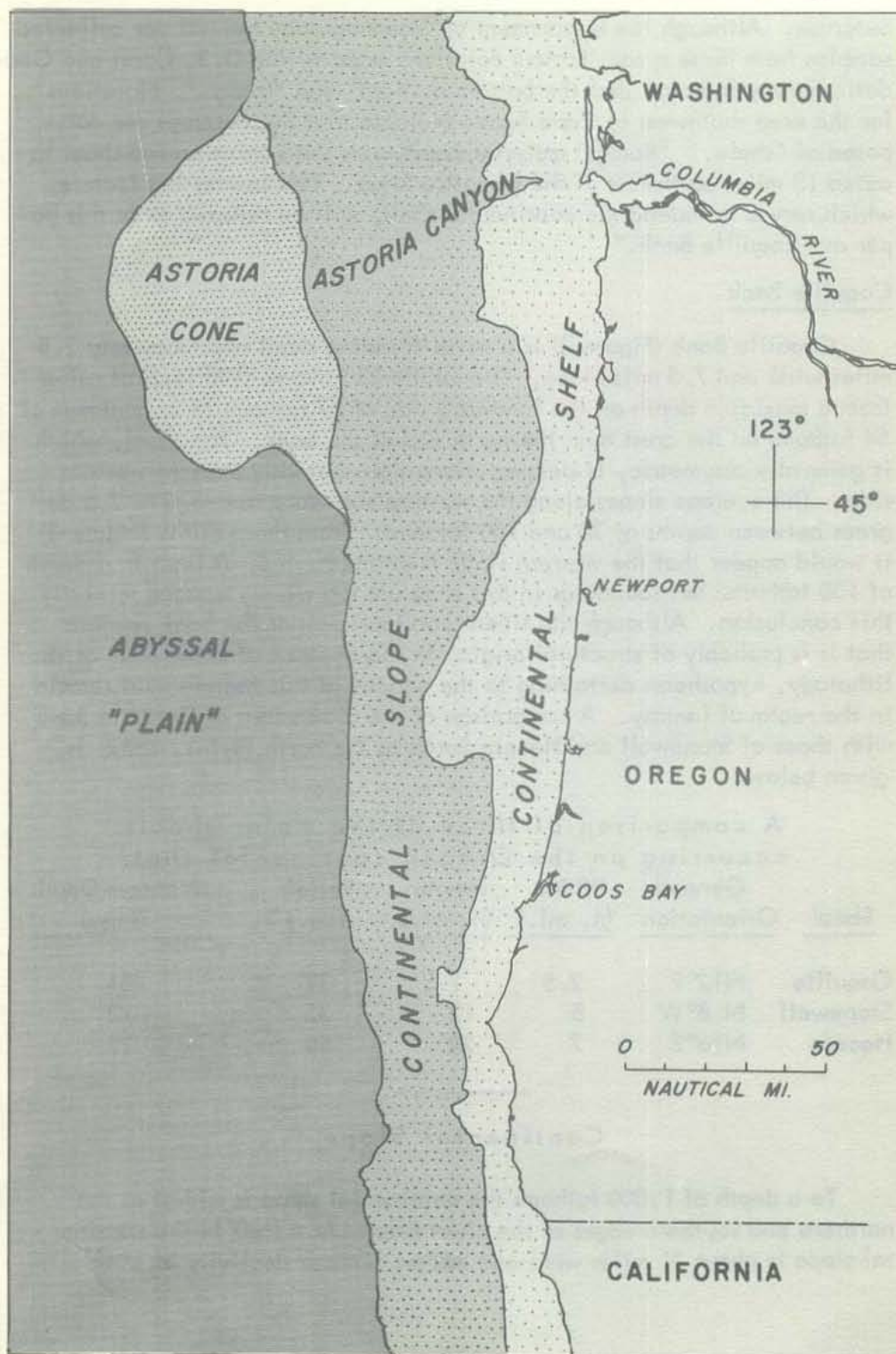
The bathymetric chart (Plate 1) was prepared from the soundings of 22 separate surveys of the U.S. Coast and Geodetic Survey. North of 42°40'N. the chart extends approximately to the 1,000-fathom contour; south of that latitude deeper soundings permitted charting of the lower portion of the continental slope and part of the abyssal plain. Because of differences in sounding densities, it was necessary to use three contour intervals. The sounding density for the continental shelf varies from eight to 40 soundings per square mile, and permits a contour interval of 10 fathoms to be used to depths of 100 fathoms. For the upper part of the continental slope, 100 to 1,000 fathoms, the sounding density is 1.5 to 2.0 soundings per square mile, and a contour interval of 50 fathoms is used. Below 1,000 fathoms the sounding density is less than 1.5 soundings per square mile, and a 100-fathom contour interval is used.

Continental Shelf

The width and slope of the continental shelf is determined by the position and depth of the shelf break (or the point at which the bottom slope increases notably toward deeper water). In the chart area, the shelf break generally occurs at depths of 90 to 100 fathoms, but in several places, such as off Cape Blanco and off the mouth of the Rogue River, the exact position of the slope increase is not easily determined. Off Cape Blanco the bottom slope increases uniformly to 200 fathoms from a depth of about 10 fathoms, and in places near the Rogue River the edge of the shelf can be picked at 60, 70, 80, or 90 fathoms. South of Cape Sebastian and north of Cape Blanco, two areas where the shelf is best developed, the shelf break occurs at approximately 100 fathoms. Using the 100-fathom contour as the average position of the shelf break, it can be seen that the continental shelf off southern Oregon varies in width from about 9 to 17 miles. The shelf is generally widest south of Cape Ferrello and north of Cape Arago. However, if the shoal southwest of the mouth of the Coquille River is considered to be part of the continental shelf, the maximum width, 17 miles, occurs at this position. Thus, the continental shelf in this area is much narrower than the world average of 36.5 nautical miles (42 statute miles according to Shepard, 1948). The slope of the shelf along the profiles of Figure 2 ranges from 0°18' to 0°40', much greater than the world average of 0°07' (Shepard, 1948).

The irregularities of the shelf surface southwest of Cape Arago and in the area between Cape Blanco and Crook Point are undoubtedly due to rock

Figure 1. Index map of the submarine geomorphic features off Oregon.



outcrops. Although the Department of Oceanography has not yet collected samples from these areas, bottom notations made by the U.S. Coast and Geodetic Survey indicate that the bottom is "hard" and "rocky." Notations for the area southwest of Cape Arago indicate that the outcrops are composed of "shale." "Rocky" material constitutes the bottom on the shoal located 18 miles southwest of the Coquille River. This interesting feature, which serves to extend the continental shelf, will be referred to in this paper as "Coquille Bank."

Coquille Bank

Coquille Bank (Figure 3) is a north-trending shoal approximately 2.5 miles wide and 7.5 miles long. It exhibits 33 fathoms (198 feet) of relief from a maximum depth on the landward side of 87 fathoms to a minimum of 54 fathoms on the crest near the north end of the bank. The shoal, which is generally assymetric, is steepest along the relatively straight western side. The average slopes along the western side vary from 3.5 to 7.5 degrees between depths of 70 and 150 fathoms. From the profiles (Figure 3) it would appear that the western slope is uninterrupted, at least to a depth of 100 fathoms; but soundings in this area are too widely spaced to verify this conclusion. Although the linear configuration of the bank suggests that it is probably of structural origin, in the absence of knowledge of its lithology, hypotheses pertaining to the genesis of this feature must remain in the realm of fantasy. A comparison of the dimensions of Coquille Bank with those of Stonewall and Heceta Banks to the north (Byrne, 1962) is given below.

A comparison of three of the major shoals occurring on the Oregon continental shelf

<u>Shoal</u>	<u>General Orientation</u>	<u>Width (n. mi.)</u>	<u>Length (n. mi.)</u>	<u>Relief (fms.)</u>	<u>Minimum Depth (fms.)</u>
Coquille	N12°E	2.5	7.5	33	54
Stonewall	N 8°W	8	12	35	13
Heceta	N16°E	7	22	40	25

Continental Slope

To a depth of 1,000 fathoms the continental slope is widest at the northern and southern edges of the chart area. At 43°30' N the continental slope is about 31 miles wide and has an average declivity of 1°48'.

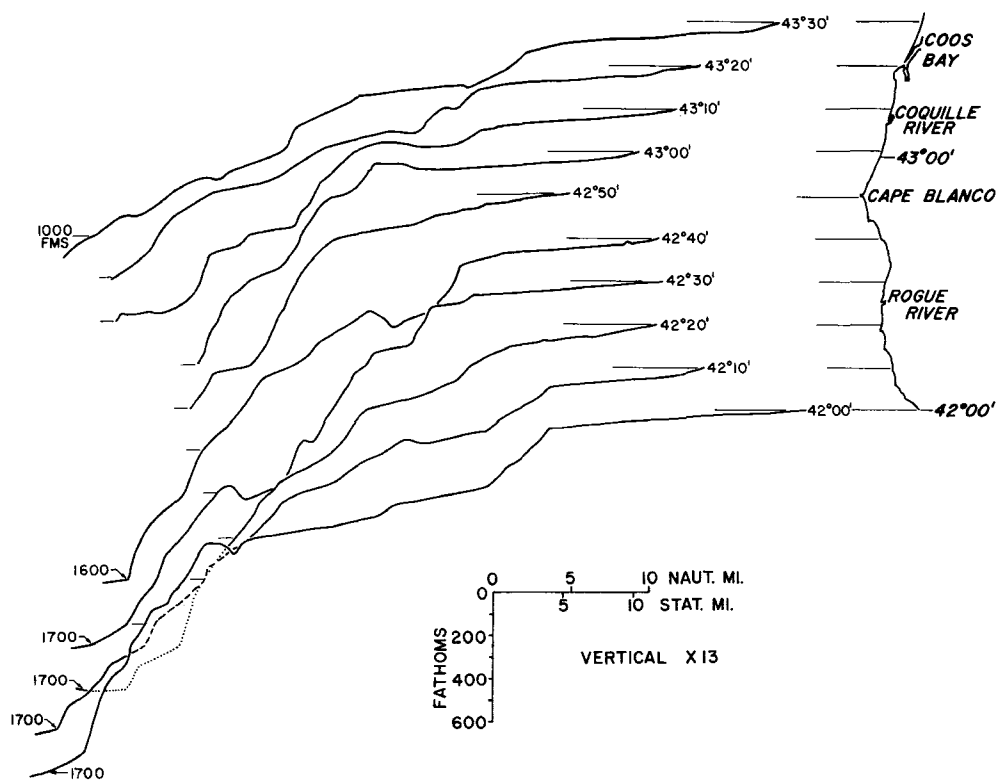


Figure 2. Profiles of the continental terrace from 42°00'N. to 43°30'N.

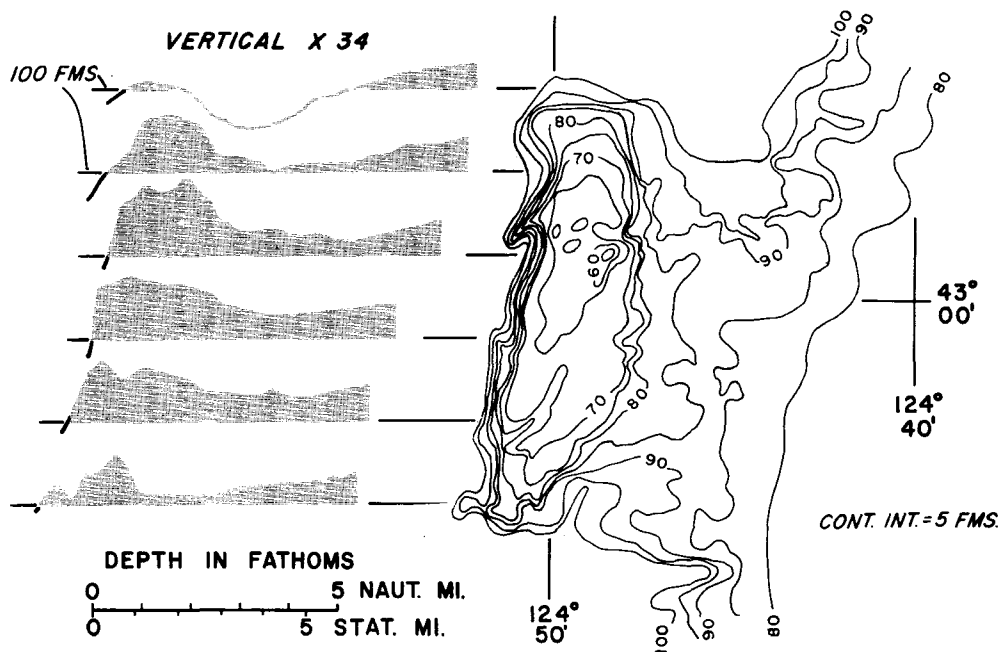


Figure 3. Coquille Bank: Bathymetry and profiles.

Off the Oregon-California boundary ($42^{\circ}00'N$) the slope is 25 miles wide to the 1,000-fathom depth, but the overall width from shelf edge to abyssal plain is about 29 miles. In this southern area, the average slope angle to a depth of 1,000 fathoms is $2^{\circ}01'$, but when measured to the abyssal plain at 1,600 fathoms, the average slope is $2^{\circ}56'$. Above 1,000 fathoms, the narrowest portion of the continental slope, 10.5 miles, lies opposite Coquille Bank. Here, the bottom declivity is $4^{\circ}54'$. Off the Rogue River the upper slope is also exceptionally narrow (13.3 miles) and steep ($3^{\circ}57'$). Along the profiles of Figure 2 the average slope for the upper part of the continental slope (100 to 1,000 fathoms) is about $2^{\circ}50'$, with the steepest slopes occurring between Cape Sebastian and the Coquille River.

Where data are available for the portion of the continental slope deeper than 1,000 fathoms, it is evident that the angle of slope is much greater, ranging from $4^{\circ}18'$ to $8^{\circ}55'$. Such a steepening at the base of the continental slope has been noted in many places off California and is referred to as a marginal escarpment. This particular escarpment can be traced southward almost 100 miles to the west-trending Mendocino Escarpment (Shepard and Emery, 1941).

Submarine valleys

The most striking features of the continental slope in the chart area are the submarine valleys offshore from Cape Blanco to Cape Sebastian and the numerous benches or terraces to the north and south of the submarine valley area. The valleys, most noticeable southwest of Cape Blanco and northwest of the Rogue River, appear to represent a "submarine drainage system" consisting of two or three major valleys with several tributary valleys. The largest and most distinct valley is the "Rogue Submarine Valley" which heads in about 70 fathoms of water 12 miles northwest of the mouth of the Rogue River. This valley has an axial slope of $2^{\circ}48'$, and can be traced for about 10 miles to a depth of 565 fathoms. Where it crosses the edge of the shelf, it is approximately one mile wide and has 76 fathoms (456 feet) of relief. Examination of the original survey data reveals that in its upper reaches the valley is steeper on the south side than it is on the north side; the south side slopes 13 to 17 degrees, the north side slopes only 6 to 8 degrees. Compared to Astoria Canyon off the mouth of the Columbia River (Figure 1), the Rogue Submarine Valley is small. At the shelf edge, Astoria Canyon is about four miles wide and has relief of 355 fathoms.

Benches

The benches, or terraces, are most evident north and south of the area

of submarine valley development. This may imply that the benches antedate the formation of the valleys and were destroyed by erosion during the formation of the valleys. The benches are shown on the chart of Plate 1 by a spreading of contour lines, but are more evident on the profiles (Figure 2) as more or less horizontal steps on the otherwise steep slopes. They do not occur everywhere at similar depths, nor are they of equal width, but they do appear to occur within definite depth zones. On the basis of a measurement of total bench widths, it appears that the benches are best developed at depths of 150 to 200, 300, 550 to 600, and 1,000 fathoms. Below 1,000 fathoms the benches are less evident than in shallower water.

The widest benches appear to be located in the southern part of the area, and are best demonstrated on the $42^{\circ}00'N.$ profile. Along this line, two fairly wide terraces are obvious from 350 to 450 fathoms and from 500 to 650 fathoms (Figure 2). Narrower benches may exist at depths from 900 to 950 fathoms and from 1,200 to 1,300 fathoms. The wider benches at 350 to 450 and 500 to 650 fathoms are about six and 10 miles wide, respectively, with slopes of $0^{\circ}56'$ and $0^{\circ}47'$.

Benches also appear to be prominent along profiles $42^{\circ}10'N.$ at 300 to 350 and 550 to 600 fathoms; $42^{\circ}50'N.$ at 150 to 200 and 800 to 850 fathoms; and $43^{\circ}10'N.$ at 150 to 200, 550 to 600, and 650 to 700 fathoms. The benches or terraces appearing on the upper slope of profile $42^{\circ}30'N.$ are not real, but are due to the coincidence of the profile with the side of the Rogue Submarine Valley.

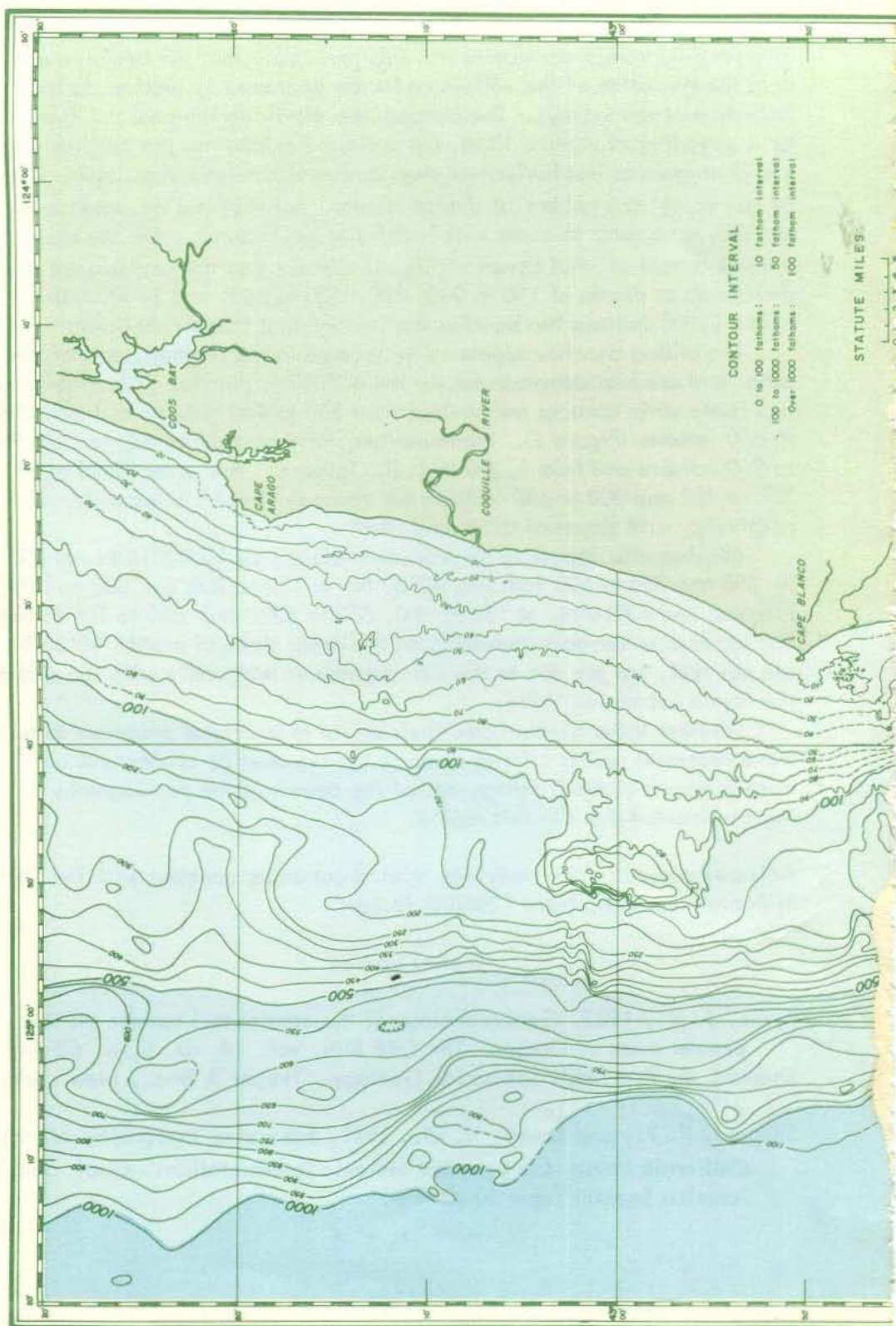
Whether these benches owe their origin to structural processes or to wave processes during a lower stand of the sea must be conjectural until more is known of the lithology and of the details of the physiography of the continental slope in this region.

Acknowledgment: This study was carried out under contract with the Office of Naval Research, Nonr 1286(02) Project.

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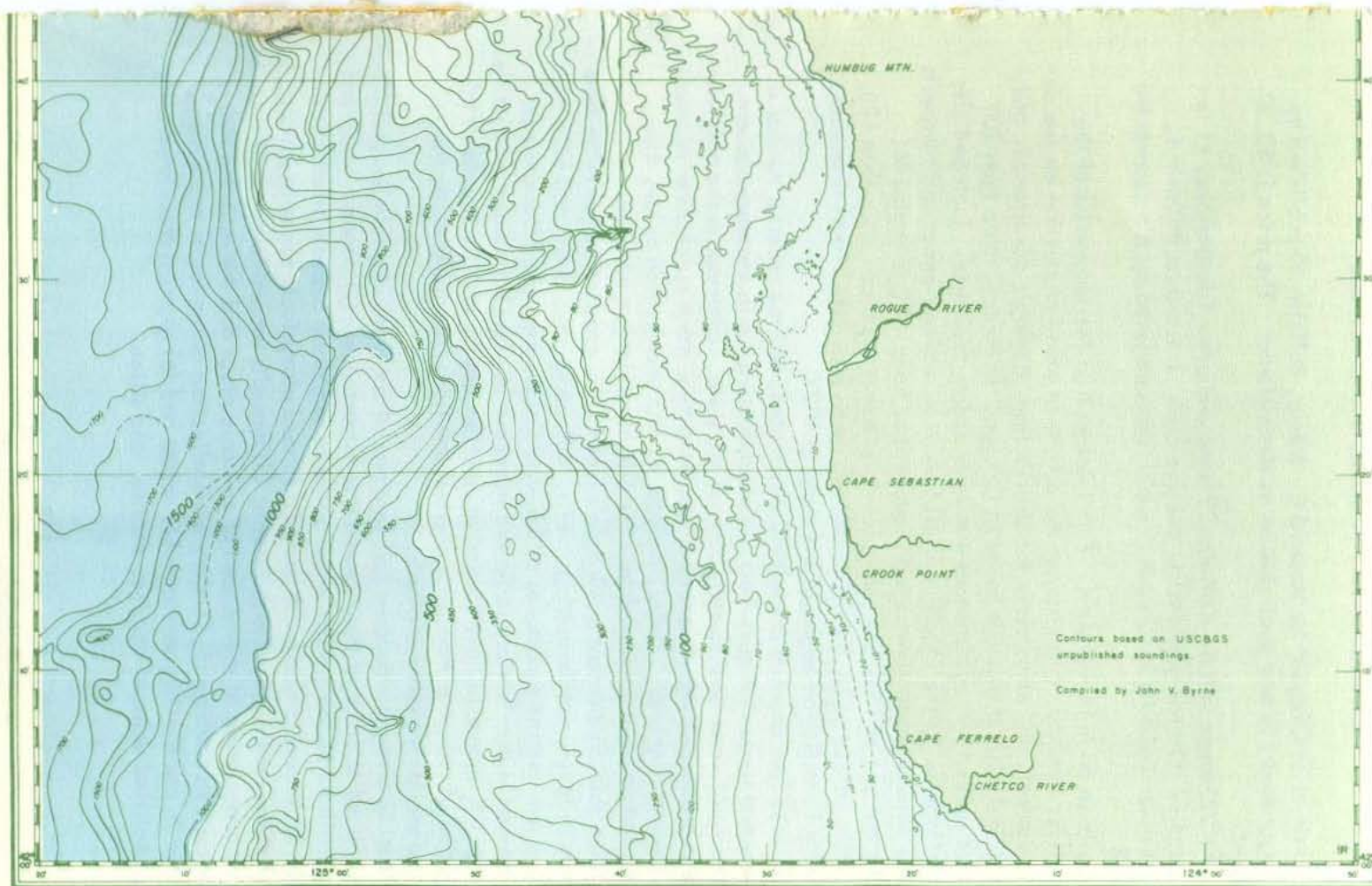


Plate 1. Bathymetric Chart of the Oregon Continental Terrace South of Coos Bay, 42°00'N. to 43°30'N

NEW QUICKSILVER BULLETIN AVAILABLE

"Quicksilver in Oregon" by Howard C. Brooks, Bulletin 55 published by this department, is now available at its three offices. The price is \$3.50 postpaid.

The 223-page volume contains 79 maps and other illustrations, 11 tables, and 84 references to earlier publications. It replaces Bulletin 4, "Quicksilver Deposits in Oregon," which was published by the department in 1938.

Bulletin 55 is in two parts. Part I delves into the economics of the quicksilver industry, emphasizing the effects of world production on the domestic market, and summarizes the distribution, geologic occurrence, and types of quicksilver deposits found in Oregon. In Part II, more than 200 separate quicksilver occurrences are described or tabulated. Included also are plates showing the location of all known quicksilver mines and prospects and the annual production of individual mines from 1882 through 1961.

To the end of 1961 Oregon quicksilver mines produced more than 103,000 flasks valued at 14.5 million dollars, more than 100,000 of them since continuous production began in the state in 1927.

Quicksilver deposits are widely distributed, but the greatest number of deposits and those that have been most productive lie in the southwestern, north-central, and southeastern parts of the state. Cinnabar is the only mineral of commercial significance, although several other quicksilver minerals have been recognized. Pyrite, marcasite, and various iron oxide, clay, silica, and carbonate minerals are the prevalent gangue minerals.

More than 99 percent of Oregon's quicksilver production has come from deposits in lavas, volcanic plugs, tuffs, tuffaceous lake beds, and both marine and non-marine sandstones of Eocene, Oligocene, and Miocene age; occurrences in pre-Tertiary rocks are numerous but few have been productive. The deposits appear to have formed at shallow depths and are the result of deposition of cinnabar from hydrothermal solutions ascending along faults, shear zones, or intrusive contacts.

Most of Oregon's deposits fall into one of six types of geologic environments, listed in order of their productive importance: (1) deposits localized along inclined bedding plane shear zones in sandstone beneath strata of relatively impermeable shale; (2) deposits formed along fault zones in lavas, pyroclastics, and tuffaceous sediments; (3) deposits formed in zones of shearing and brecciation at the borders of volcanic plugs and the intruded rocks; (4) deposits in opalite; (5) Tertiary mineralization along faults and minor fractures in pre-Tertiary metamorphic rocks; and (6) deposits associated with large crustified veins of calcite, zeolite, and silica.

OREGON GETS STATE GEOLOGIST

"State Geologist" is now the title of Hollis M. Dole, Director of the State of Oregon Department of Geology and Mineral Industries. The change in the name of the position from director to state geologist, effective September 1, 1963, was made by the legislature to conform to the long-established usage among most of the state geological surveys in the Nation. Duties of the position remain the same.

The last time Oregon had a state geologist was 'way back in the 1870's when the title was applied to Dr. Thomas Condon, first professor of geology at the University of Oregon. This was long before a state geological survey or bureau of mines was created, however. As the following brief history will indicate, a permanent state department designed to study Oregon's mineral resources and disseminate information about them for the purpose of helping to develop the state's economy was a long time in coming. In 1911 the need for such an agency was finally recognized and the legislature established the Bureau of Mines of Oregon, with headquarters in the Department of Mines of the Oregon State Agricultural College (now Oregon State University) at Corvallis. Henry M. Parks, Professor of Mining Engineering, was named director.

Two years later, in 1913, the Bureau of Mines of Oregon was replaced through legislative action by the Oregon Bureau of Mines and Geology. Professor Parks was retained as director with his office in Corvallis. This new bureau was governed by an advisory council, called the commission, which was composed of seven members and included the presidents of both the University of Oregon and Oregon State Agricultural College and five men engaged in the mineral industry. The office of the commission was in Portland, first in the Yeon Building and later in the Oregon Building. During its first year the bureau had eight members on its technical staff in addition to the director, but in later years this number dwindled to only two or three. One of the most important contributions made by the bureau was the publication of a series of investigations called "The Mineral Resources of Oregon," which assembled much valuable information that is still used.

In 1923, the Oregon Bureau of Mines and Geology was terminated as the result of various administrative malfunctions. In subsequent years bills were introduced into the legislature in an effort to reestablish a department of mining and geology with adequate funds to operate, but most of these efforts failed. During this period, the numerous inquiries by the public for information on geology and mining were necessarily handled by the college and university, entailing considerable expense and interference with the teaching programs.

In 1937 the legislature created the existing agency - the State (of Oregon) Department of Geology and Mineral Industries - having a governing board composed of three members and a director appointed by the board. Earl K. Nixon was selected as the first director. His technical staff numbered six, but within a few years it more than doubled. The main office of the department was located in Portland in the Lewis Building, and field offices were established at Baker and Grants Pass. In 1940 the Portland office moved to the Woodlark Building at Southwest Alder and 9th, where it remained for a decade.

F. W. Libbey, staff mining engineer, was appointed director in 1944 to succeed Mr. Nixon, who resigned to accept a position with the Freeport Sulphur Co. In 1951 the State Office Building at 1400 S. W. 5th Ave. was completed and the department moved to its present location on the tenth floor. Upon the retirement of Mr. Libbey in 1955, Hollis M. Dole, assistant director and former geologist on the staff, was appointed director. A bill to change the title of this position was introduced by the Interim Committee on Natural Resources in 1961 and was passed by the legislature in 1963.

Thus, after an interval of some 80 years, Oregon now joins other states in the Union in having an official state geologist.

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ROSTER OF U. S. LAKES PUBLISHED

All of the principal lakes in the United States of 10 square miles or more are listed and described in a circular recently published by the U.S. Geological Survey. Information is given on some 250 fresh-water lakes, 27 saline lakes, and 39 artificial reservoirs. Circular 476, entitled "Principal Lakes of the United States" and compiled by Conrad D. Bue of the Survey's Water Resources Division, may be obtained free from the Geological Survey, Department of the Interior, Washington 25, D. C.

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NEW LIST OF AVAILABLE WELL RECORDS.

Miscellaneous Paper 8, "Available well records of oil and gas exploration in Oregon," published by the department, has been revised to include new data received since the paper was first issued in 1960. Listed in the publication are lithologic records, borehole surveys, and drill samples which are contained in the files at the Portland office. Sales price is 50 cents.

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AMERICAN MINING CONGRESS RESOLUTIONS

At its annual meeting in Los Angeles in September, the American Mining Congress passed a series of resolutions on policy statements, setting forth the mining fraternity's views on problems affecting it. Below are three important ones.

Preamble

From the dawn of recorded history the progress of man has been associated with his initiative and intelligence in the use of his mineral resources. Tribal societies, nations, and even empires have grown great or passed into oblivion caused in large part by their success or failure in the development of mineral deposits and the production of ever better metals. Under the free enterprise system for a hundred years the mining industry of the United States has effectively and efficiently supplied the minerals and metals without which this nation might have long since receded to a second-rate power.

A strong mining industry essential to maintain the future security and economic stability of our country will continue to exist only if it can do so at a profit. We believe the competitive system under which America rose to greatness is threatened by the perils of socialistic experiments, excessive taxation, a managed currency, continued attempts at a managed economy, continued growth of union monopoly power, unwarranted federal intervention in the field of employer-employee relations and an ever increasing horde of minor public officials imposing bureaucratic mandates.

We urge our citizens to insist upon more restraints being placed upon government and also awake to the urgency of a reaffirmation of the sound constitutional principles upon which our Republic was founded.

Public Lands

This nation's future strength, prosperity and security depend upon assured sources of minerals for military and industrial needs. For such assurances there must be an active, healthy domestic mining industry. This requires free access to and full utilization of our public lands and development of their productivity through private enterprise.

We support the principle that the public domain should be put to as many compatible uses as its resources permit.

We oppose any law, regulation, decision or order prohibiting or limiting access to or utilization of any public land for the purpose of prospecting for and mining natural resources unless it is clearly established by examination and appraisal that such action will far better serve the national welfare. Future withdrawals should be kept to a minimum. Orders withdrawing public land from mineral entry should be reviewed periodically with the purpose of eliminating areas found to be in excess of need and opening them to mineral entry.

The concept of "discovery" as developed by judicial decisions should be adhered to by all departments of the Executive Branch of our Government. Government agencies should follow the decisions of our courts and should not impose their own definitions. We condemn the decisions of the Interior Department and its Bureau of Land Management and examiners which distort and disregard long-standing precedents.

Where a person of reasonable prudence is willing to do substantial work and expend substantial sums in exploration of a mineral deposit, or in the development of the means or processes to put the deposit to use, any holding that the deposit is not a "valuable mineral deposit" or that it has no "economic value" is not in accord with the mining laws. Value lies in potential as well as in present use, and this fact should be recognized by administrative agencies.

We urge upon the Department of Agriculture and its Forest Service, and upon the Department of the Interior and its Bureau of Land Management and all other governmental agencies dealing with public lands, that their regulations be administered fairly and uniformly and that their policies be formulated and carried out in a manner which will encourage, and not discourage, the development of our mineral resources.

Future exploration must, for the most part, be directed to the discovery of non-outcropping and often deeply buried mineral deposits. Hence, appropriate supplementary legislation, in keeping with the basic concepts and intent of our present mining laws, is required to afford reasonable predisclosure protection to one who is in good faith engaged in seeking a discovery of mineral. Such protection is needed to encourage the expenditures of vast sums necessary to carry forward mineral exploration.

We endorse the enactment of legislation which will provide for a study by a committee composed of Members of Congress of existing laws and procedures relating to the administration and disposal of public lands of the United States. Such legislation should recognize as the policy of Congress that the public lands be retained, managed and disposed of in a manner consistent with the principles of multiple use and of the general mining laws.

Gold, Silver and Monetary Policy

Monetary policy

With the continued deficit in international payments resulting in further decline in the nation's gold reserves and increases in dollars held abroad, the difficulties inherent in our current monetary policies are daily becoming more acute. The conflict between a domestic dollar that is not redeemable in gold and dollars in the hands of foreign central banks that are convertible into gold at the pre-war rate cannot be ignored much longer without serious danger of being forced to drastic corrections under circumstances beyond our control.

The need for monetary reforms and changes in practices that result in extreme strains on the monetary system is urgent. Steps taken or proposed by our governmental agencies to date have in general been in the right direction but far from adequate to meet the situation or to do more than delay the ultimate crisis.

Gold

Revaluation of the major currencies in terms of gold pursuant to international agreement would be merely a recognition of the inflation that has already taken place since the price of gold in dollars was fixed in 1934. To provide adequate international liquidity and to reestablish the gold standard on a basis that could be maintained, a substantially higher price is called for.

The gold mining industry under these conditions would, of course, benefit. Plants would be expanded, the life of existing mines would be prolonged and new discoveries could be expected from the stimulation that prospecting would receive. With continuation of present policies, however, domestic gold mining will soon be extinguished unless special aid of some sort is provided.

We oppose the removal or suspension of the legal requirement of gold backing of 25% of Federal Reserve notes and deposits. An approach toward this limit of our gold reserves should force corrective action while it could still be accomplished with some measure of order and control. We recommend:

1. Removal of restrictions on ownership, purchase, or sale of gold by American citizens.
2. Termination of sale of gold by the Treasury for industrial uses, thus ending the subsidy the users of gold now enjoy at the expense of the miners..
3. Provision, as an interim measure, of some aid through a premium price, subsidy or tax relief, to preserve the few existing gold mines until the industry is revived through realistic revaluation of gold.

Silver

We commend Congress for adopting legislation providing for the discontinuance of sales of Treasury silver at less than its monetary value and for the repeal of other restrictions on the purchase and sale of silver. We note that this legislation resulted from the exhaustion of Treasury stocks of free silver available for sale to industry. We anticipate a continued demand for silver for industrial and other uses in excess of supplies available from new production and other sources, and note that this will inevitably result in further depletion of the remaining Treasury stocks of silver as silver certificates are presented for redemption. This will in time confront the Treasury with the intensely practical problem of maintaining adequate stocks of silver both to serve as a strategic reserve of this essential defense metal (no Government stocks of which are maintained outside the Treasury), and for use in subsidiary coinage. We deem it essential that the use of silver in our subsidiary coinage be continued so as to maintain a coinage of substantial intrinsic value.

The impending problems resulting from the growing shortages of both gold and silver for monetary and industrial use must be faced. Under the Constitution, the Congress of the United States is charged with the responsibility "to coin money" and to "regulate the value thereof." Therefore, we further recommend the creation by Congress of a Joint Committee on Monetary Policy to inquire into the problems caused by the shortages of gold and silver, and to recommend measures to insure adequate supplies.

Other resolutions set forth policy statements on: antidumping; Government agencies, U.S. Geological Survey and Bureau of Mines; Government expenditures; import controls; labor relations; mine financing; mine safety; solid fossil fuels; stockpiling; taxation; uranium; and water and air pollution.

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PORTLAND CHOSEN AS SITE FOR AMC MEETING

Portland, Oregon was selected as the convention site for 1964 at the business session of the American Mining Congress recently held in Los Angeles. The time chosen is September 13 to 16. Earl S. Mollard (Western States Representative, The Hanna Mining Co., Myrtle Creek) was elected Chairman of the Western Division of the American Mining Congress, and Fayette I. Bristol (President, Bristol Silica Co., Rogue River), Veryl Hoover (Vice President, Pacific Power & Light Co., Portland), and Frank E. McCaslin (President, Oregon Portland Cement Co., Portland) were elected to the Board of Governors for the State of Oregon.

The convention in Los Angeles had more than 2,500 people in attendance. Besides a full program of topics of interest to the mining industry, the American Mining Congress adopted its policy for the coming year.

The American Mining Congress was founded in 1898 and is the one national organization representing all branches of the mining and minerals industry. With headquarters in Washington, D.C., it serves as a clearing house for the minerals industry in the Nation's capital, keeping the industry informed as to matters pending in Congress and in the numerous government agencies, and working for constructive action which will adequately recognize mining's special problems. It serves as spokesman for the industry on a wide range of matters involving Congressional and government policies. Through the American Mining Congress the thinking and efforts of all branches of mineral production are correlated for the advancement of the entire industry. Headquarters for the Congress are in the Ring Building, Washington, D.C. Its president is Herbert C. Jackson (Pickands Mather & Co., Cleveland) and its executive vice president is J. Allen Overton, Jr.

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WESTERN GOVERNORS MINING ADVISORY COUNCIL

At the American Mining Congress meeting in Los Angeles on September 17, the Western Governors Mining Advisory Council elected DeWitt Nelson (Director, California Department of Conservation, Sacramento) as chairman; Fayette I. Bristol (President, Bristol Silica Co., Rogue River, Oregon), vice chairman; and Kenneth C. Keller (Chief Counsel, Homestake Mining Co., Lead, South Dakota), secretary-treasurer. It was decided at the meeting that the council would meet in Denver in February for the formulation of its policy statements for presentation to the Western Governors.

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