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THE SAMS VALLEY METEORITIC SHOWER

By Erwin F. Lange*

One of Oregon's important meteorites is the 15-pound Sams Valley iron found in 1894 by George P. Lindley of Medford. Recent investigations give evidence to the fact that the Sams Valley meteorite was not an individual fall as was commonly reported, but a shower of which five specimens were found. Three individuals can definitely be accounted for. Other specimens may yet be in the possession of residents of the Sams Valley and Medford areas. It is also quite likely that other meteorites will be found in the Sams Valley area.

The 15-pound and largest of the irons was found in the Sams Valley about 10 miles northwest of Medford (see accompanying map). It was discovered lying on rocky soil, but the exact location is not known. At the death of George P. Lindley, the meteorite became the property of his son, Nolo M. Lindley. It then became known to E. W. Liljegran, also a resident of Medford. Young Lindley and Liljegran arranged for the sale of the meteorite in October 1914 to the Foote Mineral Co. of Philadelphia, a firm that was very active in meteorite dealing at that time. The iron was first reported in the scientific literature by W. M. Foote, who mentioned that no other pieces were known to have been found.

Foote's description (Foote, 1915) suggests that the Sams Valley was an old fall, since the specimen was thinly oxidized on its outer surface and was lacking a fresh fusion coating. His published report on the meteorite carried three photographs in natural size -- two of external views and one of the polished and etched surface of a slice.

The mass measured about 6.75 by 4.75 by 3.5 inches. There were no piezoglyphs (thumbprints) or flow lines from atmospheric shaping. The specific gravity was 7.794. Chemical analysis indicated the composition to be: iron, 89.36%; nickel, 9.76%; and cobalt, 0.68%. There were traces of silicon, sulfur, and copper. Widmanstatten figures produced by etching a polished section were those of a medium octahedrite.

The 15-pound mass was sawed into slices by the Foote Mineral Co. and the pieces have become widely distributed, since they were sold to collectors and museums all over the earth. It is probably safe to say that the Sams

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* Professor of General Science, Portland State College.

Valley is Oregon's most widely distributed meteorite. Four large slices and other outer pieces were cut the long way so that each slice would have the greatest possible area. Recently the writer had the opportunity to examine one of these which is in the meteorite collection of the American Museum of Natural History in New York City. According to the museum's accession records, the slice which had been polished and etched was purchased from the Foote Mineral Co. for $585.00. This slice, weighing 2.4 pounds, is one of the largest known existing pieces of the Sams Valley meteorite. A two-pound slice is in the meteorite collection of Harvard University.

The second specimen in the Sams Valley shower became known in 1938, when J. Hugh Pruett, astronomer at the University of Oregon, attempted to obtain a piece of the iron from the American Museum of Natural History. The museum proposed to give the University of Oregon a pound specimen if the University would stand the cost of cutting it and then of having the cut surface polished and etched. When the specimen arrived, Pruett was much astonished, for he wrote: (Brogan, 1939)

> When the Sams Valley meteorite arrived it proved to be an entire individual and had not been cut from a larger piece. Catalog statements that it fell as one piece were apparently incorrect.

Later Pruett described the difficulty of cutting the very hard metal from space: (Pruett, 1949)

> C. A. Coulter of the Eugene High School faculty was engaged to remove the slab with his motor-driven "diamond" saw. He estimated it would require about one hour, so set his price at $1.50. He and his teen-age son, Donald, started about 10 a.m. on Saturday. Mr. Coulter soon telephoned the writer that the meteorite was so extremely hard that his saw would hardly make a dent in it.
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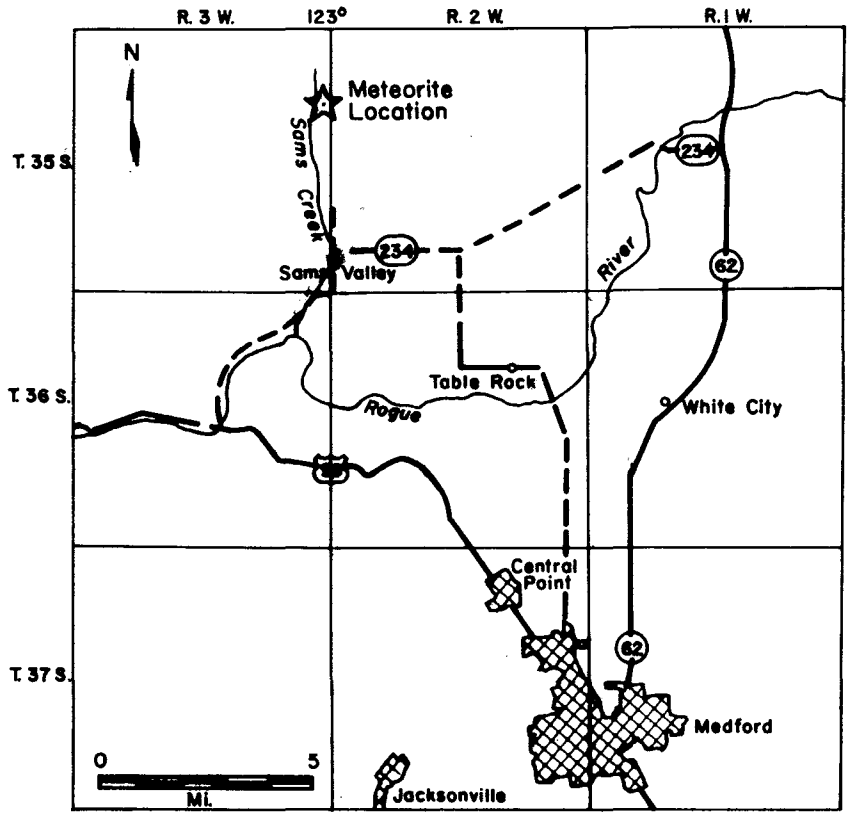
> As a last resort the humble hand-driven hack saw was put into use. Then began the back-breaking operation. "From morn to noon" they sawed; "from noon to dewy eve," but the "summer's day" was not yet done for them. At 9 p.m. the final sawdust was extracted and the slab fell off with a thud. With heavy sighs the sawyers admitted they had never before attempted to cut anything so hard. On the work bench lay 18 completely ruined hack-saw blades. But no persuasion would induce the acceptance of more remuneration than called for in the original contract.

While visiting the American Museum, the writer investigated the second Sams Valley meteoritic specimen. According to the museum's accession records, this specimen, weighing about 2.7 pounds, was obtained from E. W. Liljegran of Medford by exchange. A note in the accession book stated that the specimen was found before 1918 about 6 miles from Sams

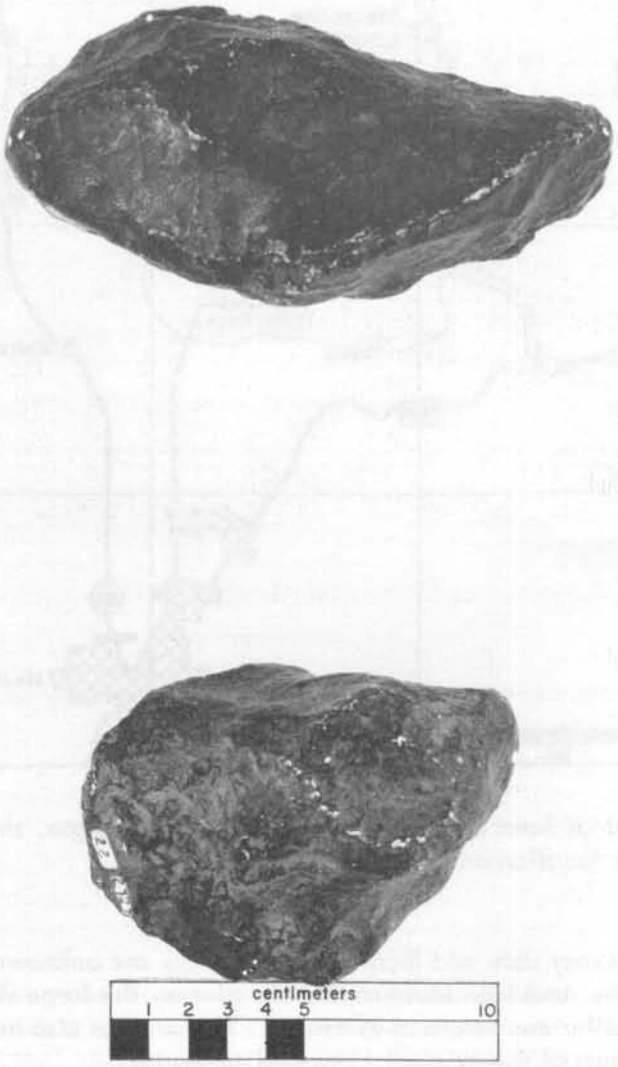


Index map of Sams Valley area near Medford, Oregon, showing meteorite location on Sams Creek.

Valley. The exact date and location of discovery are unknown. At the present time the American Museum has two pieces, the large slice and the half of the smaller one returned by Pruett. The museum also has two colored plaster casts of the original 15-pound meteorite.

The third specimen of the Sams Valley iron was made known in 1950 by Russell A. Morley, a geologist then living in Salem. During the summer of 1949, Morley and his mother visited the Jacksonville Museum in the hope of obtaining definite information regarding the exact location of the Sams Valley fall (Morley, 1950). While unsuccessful in this objective, they did find a two-pound meteorite in looking through a box of minerals. Morley had a local machinist remove a slice which, when polished and etched, produced Widmanstatten patterns characteristic of a medium octahedrite.

Morley then set out to determine the place of fall in the Sams Valley area. Most of the people he questioned were unfamiliar with any local



Two views of the 15-pound Sams Valley meteorite facsimile which is in the Museum of Natural History at the University of Oregon (photograph courtesy of J. Arnold Shotwell).

meteorites. After a long search, he was fortunate in locating Frank B. Payne, who owned property on Sams Creek (see map). Payne related to Morley how his father, W. M. Payne, had found three meteoritic specimens while panning in a small gulch on the property. The location is believed to be on the north bank of Sams Creek, about 10 feet above the stream in the $NW\frac{1}{4}SE\frac{1}{4}$ sec. 13, T. 35 S., R. 3 W. One of the specimens was given to a friend named Edward Cooper, whom Morley was unable to locate. The fate of the second specimen is unknown. The third one was the specimen in the Jacksonville Museum. These three meteorites found by the elder Payne in the late 1800's went unreported, because he thought they were of little importance.

Since the evidence is quite clear that the Sams Valley meteorite fell as a shower, it is likely that other specimens may yet be found in the general area. The writer is also hopeful that the other two specimens discovered by W. M. Payne may yet be in the hands of local residents and might be made known so they can be reported in the scientific literature.

Samples of the Sams Valley meteorite are exhibited in two places in Oregon. The Jacksonville Museum has its one piece prominently displayed amid a collection of rocks and minerals. The Museum of Natural History on the campus of the University of Oregon in Eugene has two pieces, the one obtained by Pruett from the American Museum of Natural History, and the other cut off the Jacksonville specimen by Morley. The properties of these two pieces are almost identical, indicating they came from the same fall. The Museum of Natural History at the University of Oregon also has a plaster facsimile of the Sams Valley 15-pound specimen in its meteorite collection. The accompanying photographs show two views of this facsimile at about half its actual size.

References

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Foote, W. M., 1915, Note on a new meteoric iron from Sams Valley, Jackson County, Oregon: Am. Jour. Sci., vol. 39, p. 80-86.

Morley, Russell A., 1950, The discovery of an additional Sams Valley, Oregon, meteorite: Popular Astronomy, vol. 58, p. 236-238 (reprinted in Contributions of the Meteoritical Society [vol. 4, p. 261-263, 1950].)

Pruett, J. Hugh, 1949, 'Heavenly' bodies scarce in Oregon: Sunday Oregonian, magazine section, p. 6, Jan. 16.

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DEPARTMENT DISPLAYS METEORITE SPECIMENS

Meteorites from the Ben Bones' mineral collection and from a collection on loan from Arizona State University are being displayed by the Department in several southern Oregon communities this summer. On exhibit are nine selected specimens that show the most common features of the four main types of meteorites. These include metallic irons, stony irons, chondrites, and achondrites.

Small community stores in broad valley areas have been selected for the first showings of the specimens. It is hoped that, during the short stay of the exhibit, local residents will become acquainted with what meteorites look like and will submit specimens to the Department for identification.

The meteorites have already been shown in the Table Rock store north of Central Point and in the Sams Valley store at Pruitts Junction, in the United States National Bank branch in White City, and at the Josephine County Fair. Between August 26 and September 4 they will be on display in the Crafts and Hobbies Building at the State Fair in Salem

FIELD WORK BY STATE AND FEDERAL GEOLOGICAL AGENCIES SUMMER 1967

By R. E. Corcoran*

The summary of field activities described in the following paragraphs illustrates the work that is being done this year by this Department and by the U.S. Geological Survey. Areas where work has recently been completed or is still in progress are outlined on the accompanying map.

Activities of the Department

1. Engineering geology of the northern Willamette Valley

H. G. Schlicker, engineering geologist with the Department, and R. J. Deacon, Portland consulting geologist, completed the first part of this long-range project by publication of a report on the Tualatin Valley (Department Bulletin No. 60) in the spring of 1967. Studies are planned for the Salem area in the future.

2. Geology of the upper Chetco River area, Curry County

Len Ramp, assisted by members of the Department and students from the universities, has been mapping in the Kalmiopsis Wilderness area. The Department is developing a better understanding of the mineral potential of the upper Chetco River drainage and is acquiring more information on the bedrock geology before this large region becomes closed to prospecting and mineral entry.

3. Geochemistry of stream samples, southwestern Oregon

R. G. Bowen, assisted by students from the universities, is completing a geochemical sampling program in southwestern Oregon which began in 1963. More than 7,000 samples of stream and bank sediments collected from the area will be analyzed in the laboratory for copper, zinc, molybdenum, and mercury. Information on analyses made thus far is available in the Portland office.

4. Geothermal investigation of the Klamath Falls area

N. V. Peterson, district geologist, and E. A. Groh, private geologist, spent part of the summer continuing their investigation of the geothermal zone located beneath Klamath Falls. Results of their work will be published in a forthcoming issue of The ORE BIN.

5. Geology of the pre-Tertiary rocks in the Snake River canyon

H. C. Brooks, district geologist, and T. Vallier, professor of geology at Indiana State University, have spent the past summer working in the Snake River gorge north of the Oxbow Dam, and also in the Huntington and Olds Ferry quadrangles to the south. This is the continuation of past work in the Baker quadrangle by Brooks and Vallier and will add to the geologic mapping of H. J. Prostka, formerly with the Department. This work, when completed, will be published in the Department's geologic map series as well as being incorporated in the geologic map of the Baker AMS quadrangle.

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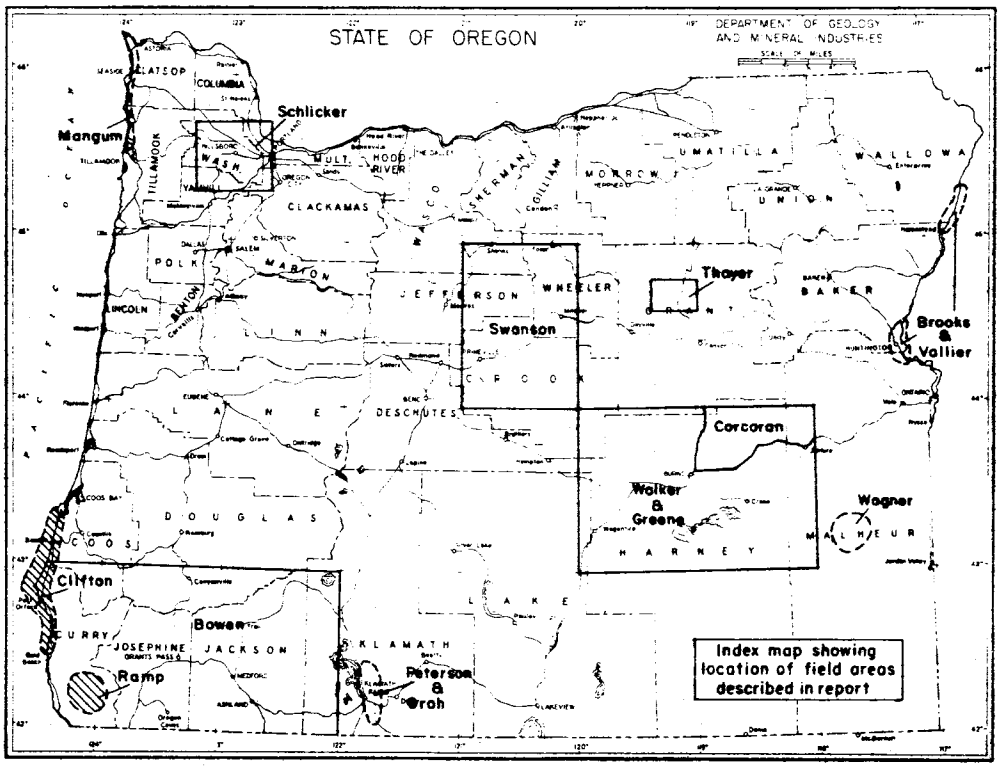
*Stratigrapher, State of Oregon Dept. Geology and Mineral Industries, Portland.



6. Geology of the northeast quarter of the Burns AMS quadrangle

R. E. Corcoran continued field work in the northern part of Harney County for the State Geologic Map project. Mapping was concentrated in the plateau area in the upper reaches of the middle fork of the Malheur River, tracing Miocene and Pliocene volcanics and continental sediments westward from the vicinity of Drewsey and Van guard station. The geology of this area will eventually be integrated with maps by Walker and Greene (U.S. Geological Survey) in the western and southern parts of the quadrangle.

7. Geology of Oregon State Parks

During the summer of 1966, the Department and the State Parks Division shared in an experimental program to produce geologic information of interest to the park visitor on some of the major state parks (see April and May 1967 issues of The ORE BIN). This summer Miss Doris Mangum is field mapping in several state parks between Tillamook and Astoria.

8. Lava tubes in Malheur County

N. S. Wagner visited several large lava tubes in southern Malheur County in company with staff members of the U.S. Bureau of Land Management. The tubes occur in lavas north of Rome on lands under the jurisdiction of the B.L.M., and a geologic inspection was requested in order to determine whether these tubes were safe enough to be opened to the general public. A report summarizing the findings and recommendations will be presented in the near future.

Activities of the U.S. Geological Survey

Probably the most significant new program started during the past year by the U.S. Geological Survey was the Oregon Black Sands Project. The Office of Marine Geology and Hydrology, headed by Parke D. Snavely, will investigate the origin, distribution, and economic potential of black-sand deposits on the continental margin off southern Oregon (see May 1967 ORE BIN).

R. E. Greene and G. W. Walker continued working in the Burns AMS quadrangle for the State Geologic Map project. D. A. Swanson is completing the east half of the Bend AMS quadrangle, T. P. Thayer is finishing the geologic maps of the 15-minute Court Rock and Long Creek quadrangles, and R. C. Coleman has been investigating the Colebrook Schist in southwestern Oregon.

In the spring of 1968 the U.S. Geological Survey, in cooperation with the Department, will publish a report on the mineral resources of Oregon. This report will describe the geology, geologic history, and geomorphic provinces and give a detailed description of more than 60 known occurrences of metallic and non-metallic mineral deposits in the state.

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WISCONSIN STUDENTS STUDY CURRY COUNTY GEOLOGY

This summer the University of Wisconsin established its field-geology camp in Curry County, with headquarters at the Ben Gardner ranch on Pistol River south of Gold Beach. Enrolled in the field session were 20 geology students, including three girls, under the direction of Dr. Robert Dott, Jr., professor of geology at the University of Wisconsin. Also from Wisconsin and working with the students were Dr. Gordon Medaris and Robert Laudon. The study area for the field session included the Cape Sebastian and Pistol River regions.

This part of the state was chosen by Dr. Dott because of its complex geology, which gave the students a real challenge in learning to map structures and formations. In previous years Dr. Dott had small groups of graduate students in Curry County deciphering the geology of the coastal region between Port Orford and the California border. Results of some of their work have been published in The ORE BIN (March, 1961; August, 1961; August, 1962; March 1966; and May 1966).

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AUSTIN DUNN DIES

Austin Dunn, native of eastern Oregon, prominent Baker lawyer, and former state senator (1946-1950), died July 15 at the age of 58. He was active in many state and community affairs and was the author of the Dunn Bill that first established community colleges in Oregon. Mr. Dunn served on the Department's governing board from 1953 to 1957.

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GRANT COUNTY GEOLOGY HAS TOURIST APPEAL

Geology is much more than just rocks. For Grant County it is a potential for attracting tourists. As a result of the comprehensive research by Dr. Tom Thayer of the U.S. Geological Survey, geology in Grant County will receive nation-wide publicity through the publication of a leaflet by the Department of Interior, according to the Blue Mountain Eagle.

Thayer conducted a two-day trip August 15 and 16 to show the recreational geological areas to approximately 70 persons, including representatives from federal, state, and local agencies and citizens of Grant County. Arrangements for the two-day tour were made by the Grant County Planning Commission under the direction of C. L. Smith, assisted by Gordon Glass, Phil Hirl, Ralph Denny, and Bill Farrell. On the first day the group traveled along the John Day River to Kimberly and then on to Long Creek and Fox Valley, seeing many geological features on route. On the second day, stops were made at a fault east of John Day and at Hall Hill, Dixie Mountain viewpoint, and Strawberry Lake. The photographs on the opposite page show Tom Thayer (rear center in upper photograph) explaining the geology of the area to members of the tour, and (lower photograph) the glaciated volcano on Strawberry Mountain (photographs courtesy of Blue Mountain Eagle).

KENNECOTT SUBSIDIARY LOCATES COPPER CLAIMS

Kennecott Copper Co. has located, through its wholly-owned subsidiary the Bear Creek Mining Co., a total of 38 mining claims in the Keating area of Baker County. The claims are situated in the well-known "copper belt" which extends for a considerable distance in the northeastern part of the county. The area is dotted with old mines, some of which have produced a considerable quantity of gold. Bear Creek has already commenced exploration work, but details of plans for future activity have not been announced.

The Department made a geochemical examination of a part of the district near the Burkemont mine in 1960. Samples were restricted to the Clover Creek Greenstone of Permo-Triassic age. Geologic mapping has been conducted in the area. The Department published a geologic map of the Sparta quadrangle in 1962, and a similar map of the Durkee quadrangle has just been issued.

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IRON ORE MINED IN JACKSON COUNTY

Keldon G. Adams of Medford, Oregon, is selectively mining high-grade iron ore from the Tolman iron property near Gold Hill in Jackson County. Lump magnetite is screened and concentrated by using a belt with magnetic pulley. Adams is shipping 200 tons to the Hanna Nickel Smelter, where it will be used in the smelting process. The quality of the magnetite in this first shipment will be the basis for negotiating a contract for Hanna's future magnetite needs.

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GEOLOGIC MAP OF DURKEE QUADRANGLE PUBLISHED

The Department has published "Preliminary Geologic Map of the Durkee Quadrangle, Oregon" by Harold J. Prostka. The map is designated as GMS-3 and consists of a single sheet, 22 by 26 inches in size, with a multicolored map, cross section, and explanation on one side and with a text on the other. The publication can be purchased for $1.50 from the Department's offices in Portland, Baker, and Grants Pass.

The Durkee quadrangle lies in Baker County in northeastern Oregon immediately south of the Sparta quadrangle, which was also mapped by Prostka (GMS-1). The Durkee quadrangle is underlain by Permian and Upper Triassic metamorphosed volcanics and sediments and two ages of intrusive rocks. Complex folding and faulting of metamorphosed rocks make age relationships somewhat uncertain. Miocene lavas, Pliocene lake beds, and Pleistocene alluvium occupy fairly large areas in the quadrangle.

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NEW DRILLING PERMIT ISSUED

The Department issued Drilling Permit No. 59 to William G. Craig of Tacoma, Wash., on July 17, 1967. Mr. Craig plans to drill a shallow gas test in Marion County near the site of the Portland Gas & Coke Co. "Wiedehker 1," which was drilled in 1935. Gas shows were reported in the old hole between 490' and 1600'. The William G. Craig "Gilmour 1" is located approximately a mile northeast of the Buena Vista Ferry in the $SW\frac{1}{4}$ sec. 24, T. 9 S., R. 4 W., Marion County. Coordinates are approximately: 3170' N. and 685' E. from the southwest corner sec. 24.

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GROUND-WATER STUDIES PUBLISHED

Two ground-water studies recently issued by the U.S. Geological Survey are: Water Supply Paper 1833, "Geology and water resources in the French Prairie area, northern Willamette Valley, Oregon," and Water Supply Paper 1839-I, "Ground water reconnaissance in the Burnt River valley area, Oregon." Author of both reports is Don Price. The two papers are concerned with the availability of ground water for irrigation and both contain geologic and hydrologic maps. They may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. WSP 1833 on the French Prairie area sells for $1.50; and WSP 1839-I on the Burnt River valley sells for 55 cents.

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L. L. HOAGLAND TO RETIRE

L. L. Hoagland, assayer-chemist for the Department for the past 24 years, retires September 17, and all of his friends both inside and outside the Department wish him the best of years ahead.

Mr. Hoagland, better known as "Hoagy," is a native of Utah. He majored in chemistry at the University of Utah and during his student years he was employed as an assayer at Bardwell Assay Office in Salt Lake City and at Magma Copper Mill of the Utah Copper Co. He became assistant chemist and later chief chemist at the Portland Cement Co. of Utah. In 1928 he moved to California to accept the position of assistant chemist and plant investigator for C&H Sugar Refining Co. Later he worked as assayer for Alabama-California Gold Mines Co.

In 1943 Hoagy moved to Portland to become the Department's first assayer-chemist at its Portland office. During his 24 years in the Department's assay laboratory he has handled 32,000 samples requiring approximately 96,000 determinations. The above photograph shows him performing one step in the fire assay for gold. In addition to making assays, Hoagy claims that he has made more than 5,000 pots of tea on the bunson burner for the staff lunchers.

Retirement for Hoagy is more a matter of shifting his locale than of quitting work -- in his leisure time he will run a small assay laboratory in his basement.

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RAY C. TREASHER, 1908 - 1967
An Appreciation by F. W. Libbey

Mr. Ray C. Treasher died suddenly at Duncans Mills, Cal., on June 25, 1967. He was born in Chicago. The family moved to Sunnyside, Wash., in Ray's early youth. He attended Washington State College at Pullman (now Washington State University) and graduated with B.S. and M.S. degrees, majoring in geology. After graduation, he taught school at Longview, Wash. In 1935 he was appointed Economic Geologist on the staff of the Oregon State Planning Board and, with Dr. E. T. Hodge as co-author, he compiled the "Bibliography of the Geology and Mineral Resources of Oregon," which the Board published in 1936. At this time the U.S. Army Corps of Engineers conducted a survey of non-metallic mineral resources of Oregon, Washington, and Idaho in relation to the market potential for electric power to be generated at Bonneville Dam, and Mr. Treasher was a geologist in the study group.

In 1937 Ray was the first geologist appointed to the staff of the then newly formed State of Oregon Department of Geology and Mineral Industries with head office in Portland, and originated the name "Ore Bin" for the Department's monthly publication, first called "News Letter." He was co-author of the Department's Bulletin No. 6, "Preliminary Report on Some of the Refractory Clays of Western Oregon" with Dr. Hewitt Wilson, professor of ceramic engineering at the University of Washington. This report was in great demand just before and during World War II, when the government was actively investigating high-alumina mineral resources because of anticipated shortage of bauxite. He was the author of the widely used geologic map and text in the report entitled "Geologic History of the Portland Area" (Short Paper No. 7). While he was stationed in Portland, he also authored various other papers on Oregon geology published in The ORE BIN, the Newsletter of the Geological Society of the Oregon Country, Northwest Science, and Geological Society of America Abstracts. He also compiled, in collaboration with members of the Department staff and Dr. Lloyd W. Staples of the University of Oregon, Bulletin No. 16, "Field Identification of Minerals for Oregon Prospectors and Collectors," published in 1940.

Later, as field geologist stationed at Grants Pass, he constructed a geologic map of southwestern Oregon. At this time his field work included studies of the mines of this area, together with the accompanying file reports generally incorporated in the Department's "Metal-Mines Handbook."

In December 1943 Ray accepted a position as geologist with the Corps of Engineers at Sacramento. Here he became Assistant Chief of the Geology Section (1945-1950) and received several commendations for various projects. He was project geologist for the Folsom Dam and Reservoir project near Sacramento.

Upon completion of his work at Folsom, and because he was recognized as an outstanding engineering geologist, Ray was offered and accepted the position of Chief Geologist at the San Francisco District (1953).* While he was with the San Francisco District, he almost single-handedly developed and supervised the geologic exploration, design, and construction of numerous civil works projects as well as military installations, most notable of which are the "Coyote Dam" near Ukiah, Calif., and the "Comprehensive Survey Report on San Francisco Bay." Out of these projects came several professional papers, which he authored, that stand today as outstanding contributions to the field of engineering geology.

Ray was never one to sit still very long, nor was he satisfied with a standard eight-hour day. He, among others, recognized the potential importance of the field of engineering geology. In 1957 the Association of Engineering Geologists (formerly the California Association of Engineering Geologists) was formed. It is now a national organization encompassing more than 1,000 members. His part in this organization was initially as a charter member, later as Chairman of the San Francisco Section, and finally as Honorary Member. He was a long-standing and active member of the Geological Society of America and became a "fellow" in 1957.

Following his retirement in 1961, Ray acted as consultant engineering geologist for various construction companies, primarily in search of structural stone of good quality, in which work he was a noted expert.

Ray was a charter member of the Geological Society of the Oregon Country and its fourth president; a member of the Monte Rio Community Church, and a World War I veteran. His wide acquaintanceship and professional activities made him a host of friends. They surely will miss his fellowship at future professional and social meetings.

He is survived by his wife, Jessie A. Treasher, Duncans Mills, Cal.

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* The material concerning his work in California up to the time of his retirement was furnished by his successor, Mr. Ronald H. Gelnett, Chief Geologist, Corps of Engineers, San Francisco District.

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STATE OF OREGON NUGGET ON DISPLAY

Proof that large gold nuggets are still found in Oregon can be seen in the Department's museum display case at its Portland office. A flattened nugget resembling the shape of the State and weighing 1-1/3 ounces was found by Wes Pieren of Grants Pass while he was mining the Leipold placer on Galice Creek in Josephine County this spring. The specimen is on loan to the Department for an indefinite length of time.

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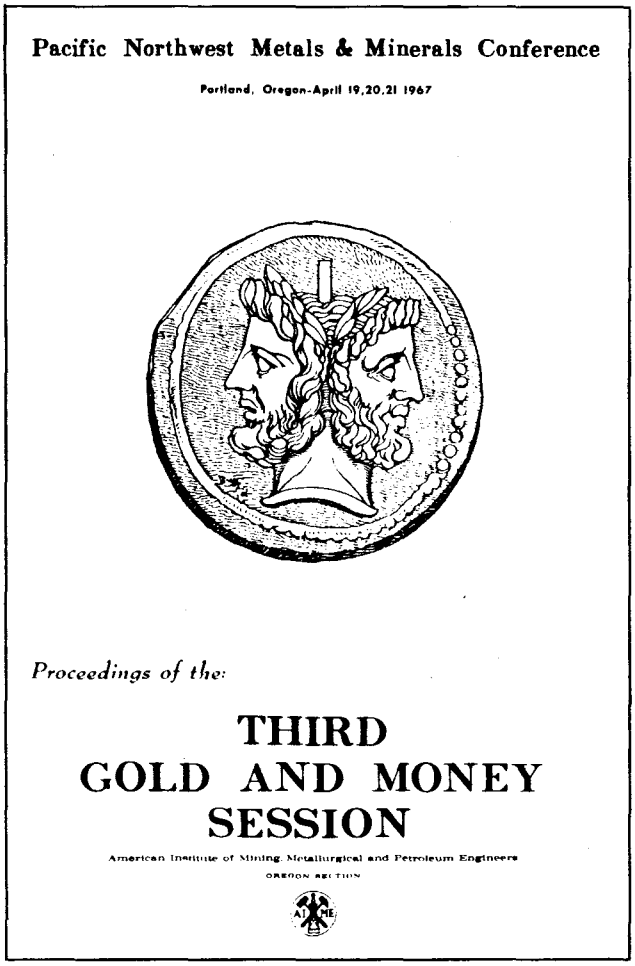

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Contents

- Have 6000 Years of Gold Mining Exhausted the World's Gold Reserves?
  Paul M. Kavanagh
- Gold or Authoritarian Money?
  J. E. Holloway
- Is Gold as Good as the Dollar?
  Lorie Tarshis
- Gold as an Economic Fever Thermometer
  C. Austin Barker
- Panel Discussion
  Hollis M. Dole, Moderator
- What Price Gold?
  Pierre R. Hines
- Monetary Alchemy
  Donald H. McLaughlin
- Gold Subsidy Legislation Statement
  Hon. Joseph W. Barr