GEOLOGICAL SOCIETY NEWS LETTER

Volume 6, 1940

SUBJECT INDEX FOR VOLUME 6, 1940.

Wessley Paulsen

AUTHOR INDEX FOR VOLUME 6, 1940

Wessley Paulsen

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 1 PORTLAND, OREGON Jan.10, 1940

OFFICIAL PUBLICATION OF THE

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Geological Society of the Oregon Country
329 S.W. Oak Street, Portland, Oregon
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Signature

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Lectures

ALL LECTURES ARE HELD IN AUDITORIUM OF PUBLIC SERVICE BUILDING
SIXTH AVENUE AND TAYLOR STREET.

Friday Jan.12 — Subject: GEOMORPHOLOGY OF EUROPEAN BATTLEFIELDS.
Speaker: Dr. Edwin T. Hodge

A discussion of the facts of geology as they affect national interests. The reasons for the rise and fall of empires do not lie entirely in the economic nor ethnologic fields. The influences of land forms in the territories concerned sway the fortunes of contending nations to a remarkable degree. A review of this phase of geology in its relation to the present European conflict will help greatly to a true appraisal of the international situation. We are privileged to have it brought before us by our own Dr. Hodge, who, as we all know, is qualified to speak with authority on the subject.

Friday Jan.26 — Subject: CHEMICAL ASPECTS OF FLUORESCENCE IN MINERALS.
Speaker: Dr. A. H. Kunz, Professor of Chemistry, University of Oregon, Eugene, Oregon.

This is a basic and important phase of geology which has not yet been treated at any of our lectures, and its presentation on this occasion by Dr. Kunz assures us a clear, interesting and valuable contribution to our understanding of the subject. He will begin with a review of classical atomic theory, and follow with an outline of modern ideas of atomic structure and then present an interpretation of mineral structure and fluorescence on the basis of the previously discussed modern conceptions. His talk will be illustrated by lantern slides.

Friday Feb.9 — Subject: EARLY MAN IN OREGON.
Speaker: Dr. L. S. Cressman, Professor of Anthropology, University of Oregon, Eugene, Oregon.

In recent years the University of Oregon, thru the Dept. of Anthropology and the Oregon State Museum, has carried out extensive research work in south-central Oregon and the evidence gathered tells a story of ancient man which, for thrill, rivals that of a good novel. It tells of early Oregon man's association with extinct Pleistocene animals; of his witnessing the cataclysms which gave birth to Crater Lake; of his presence in ringside seats at the eruptions of Newberry Craters. These facts, and others brought out by research, we are privileged to have presented to us by Dr. Cressman, under whose skillful direction the evidence was gathered and interpreted. In addition he will show two reels of motion pictures illustrating the nature of the field work.

Friday Feb.23 — Annual business meeting. Chairman of entertainment committee, Mr. Carl Richards, states business will be followed by a short program.

****

Trips

Sunday Jan.14 Tualatin Valley. Dr. Francis Jones.

Caravan will leave SW Front Avenue and Yamhill Street at 9:00 a.m. going through Oswego. First stop will be at Cook to compare this gravel type with that found in the Portland area. Bull Mountain will be visited to study the physiographic features of this part of Tualatin Valley. Proceeding down west slope of mountain a clay tile plant near Scholls. Hillsboro next stop to examine a nest of large boulders, probably residual from old lava flow. Passing through Forest Grove to Scoggins Creek quarry where a stop will be made to collect fossils, then to Gaston and Wapato Lake, Chehalem Valley to Newberg, where caravan will disband. Mileage approximately 65 miles.

****

REPORT OF NOMINATING COMMITTEE.

As provided in Article VI, section 1 of the Constitution, the Nominating Committee has filed the regular ticket of nominees for office in the Society on which a ballot will be taken at the annual business meeting, February 23, 1940, as follows:

President	J. C. Stevens
Vice President	A. W. Hancock
Secretary	Miss Rose Jennings
Treasurer	Miss Helen Iverson
Director	Clarence D. Phillips

The office of Director on which the ballot will be taken is for the three-year term beginning March 1, 1940, succeeding Kenneth N. Phillips, who retires as of Feb. 28th.

"Any ten members may file with the Secretary other nominations for any of all offices, but such nominations must reach the Secretary not less than thirty days previous to the annual meeting." Thus, the opportunity for nominations by petition will expire January 24, 1940.

****

With the appointment of the Banquet Committee by President Piper, once more it is brought to mind, that this enjoyable event is just around the corner.

Dr. Courtland L. Booth, chairman

Mrs. E. A. Boyrie	Dr. Francis Jones
Mr. & Mrs. T.A.Carney	Mr. & Mrs. Kurtichanof
Miss Constance Endres	Mrs. R. R. Poppleton
Miss Helen Iverson	Miss Grace Poppleton
Miss Florence Iverson	Dr. & Mrs. A. Weinzirl
Mrs. Mildred P. James	Mr. & Mrs.Chester A. Wheeler
Mrs. Mabel C. Smith	Mr. & Mrs.Clarence D. Phillips

Dr. Booth states that other members will be invited to serve on this committee, and suggestions concerning stunts or acts from any of the membership will be appreciated.

B O O K R E V I E W

M A Z A M A A N N U A L - D e c e m b e r , 1 9 3 9.

The Mazamas, Portland, Oregon. 112 pp. $1.00.

Once again the month of December brought forth a Mazama Annual, and once again, too, it is a production which does great credit to its contributors and publishers. As with former issues, this latest one contains much of interest to members of the Geological Society of the Oregon Country. Within its more than a hundred pages are many articles descriptive of the Mazama Club's outings and other activities during 1939. But that Club is not merely an organization which conducts trips to the mountains; it has other constructive features, one of which is stated in its constitution to be the collection and dissemination of scientific knowledge concerning snow peaks and other mountains, especially those of the Pacific Northwest. Hence, the club's organization includes committees to carry out these functions, - a research committee for collecting and a publication committee for disseminating. So it is that, included with the descriptive articles, there are others of exclusively scientific interest.

One such article is by Dr. Francois E. Matthes of the U. S. Geological Survey, Washington, D.C., entitled "Glaciers of our own time". It comprises a detailed development in convincing style of his thesis that the present glaciers of the Cascade Mountains are to be regarded as the modern successors, rather than the lingering remnants, of the ice streams of the glacial age. Four photographic illustrations add to the interest of the article, the subject of which was treated briefly in the GEOLOGICAL NEWS-LETTER, vol.5 no.13, p.119.

Some members of the G.S O.C. who are also Mazamas, have fine articles in this issue. Kenneth N. Phillips, in his "Farewell to Sholes Glacier", tells of the discovery and subsequent disappearance of this glacier on Mt. McLoughlin, all occurring within the lifetime of the man for whom it was named. A photograph of it is given showing it as it was at the time of its discovery in 1896 and alongside is another picture, taken by Mr. Phillips last July from the same viewpoint, showing the empty channel in which the former glacier flowed.

An interesting corollary to the story of the disappearance of Sholes Glacier is the report on pp.89-90 of the Club's Research Committee, of which Mr. Phillips is chairman. It records the measurement of recession of Eliot and Coe Glaciers on Mount Hood which disclosed retreats of 64 and 59 feet respectively. This is the greatest amount of recession recorded on these glaciers since such annual measurements were begun in 1925. Other items in this report tell of measurements by means of a cryocinemeter of the rate of motion of the ice at the termini of Nisqually and Eliot Glaciers; of the maximum and minimum temperatures recorded on Mount Hood's summit; and of the temperatures of fumaroles in the crater.

Another G S.S.C.member contributing to this magazine is Dr. Donald B. Lawrence, who supplements his 1938 report on the flora of Mt. St. Helens with a description of his research work in three periods of about a week each during July, August and September, 1939. Those who heard his fine lecture on this subject last July will be particularly interested in this further account of his work on the slopes of our youngest volcano. His article is illustrated with four fine aerial views of the mountain, one taken from each point of the compass.

There is an informative outline of the mass production method used in fighting forest fires in an article by E. H. MacDaniels of the Forest Service, which tells of the greatly improved technique that has been worked out recently for fighting the red menace.

An article entitled "Leading the Snow Army", by Fred H. McNeil, is a fascinating resume' of the events leading up to the present, widespread popularity of skiing and other winter sports on Mount Hood. The writer of this historical sketch is the author of the book "Wy'east THE Mountain" and, in addition to being a student of the history of the locality, possesses an intimate, first-hand acquaintance with the mountain, acquired by climbing and exploring its slopes over a period of some twenty-five years. His article, therefore, is authoritative, and it deals with a most timely topic.

Descriptive articles cover climbing on peaks from Mt.McLoughlin in the south to Mt. Olympus in the north, as well as the story of a Mazama's "ramble" over several of the 14,000 foot peaks in Colorado. These and many other delightful episodes are packed into the pages of this attractive "Annual".

A review of this publication for the members of the G.S.O.C., however, would not be complete without drawing attention to the brief account on p.69 of the awarding of the Parker Cup to Kenneth N. Phillips. This cup is presented each year to the Mazama member who has done outstanding work for the Club, and an impressive list of Ken's accomplishments is appended in support of his title to the honor. A photograph, snapped at the moment the presentation was made, occupies half the page, appropriately recording the climax of this well merited award.

A third G.S.O.C. member who played a part in this production is Florence M. Richards, who compiled the index to the last ten Mazama Annuals, 1930 to 1939, which appears on pages 104-112. The first index, covering all previous issues, was published in the 1929 Annual; so this one brings the indexing of all issues up to date.

In addition, there is the usual run of more or less formal reports of various committees, finances, etc., as well as a complete list of members - a total of 690. All these, together with a number of poems, pictures and pertinent paragraphs, round out a publication, which, for one produced entirely by voluntary effort, ranks highly.

- C.P.R.

****

We were glad to have Dr. Hodge with us at the Thursday luncheon January 4th. This reminds us that once again the Portland Extension courses opened for the second term, and under Geology the following is noted:

"Edwin T. Hodge, Ph.D., Professor of Economic Geology,
Oregon State College. G 201p., 202p., General Geology.
Thursday 7:15, room 110" .
First class, Thursday, January 4th."

GEOLOGICAL NEWS LETTER

VOL. 6, NO. 2 PORTLAND, OREGON Jan. 25, 1940

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Friday Mar.8 — Annual Banquet.
Reed College Commons.

****

TRIPS.

Sunday Feb.11 — Earl E. Marshall, leader.
Historic points of interest along Skyline Trail and on Tualatin Plains.

SPECIAL NOTICE

The annual Dinner Meeting of the Geological Society of the Oregon Country will be held the evening of March 8th, 1940, according to Dr. Courtland Booth, chairman of the committee on arrangements.

Dr. George F. Beck, professor of Geology at the Central Washington College of Education, Ellensburg, Washington, will be the guest speaker, he stated. Dr. Beck's subject will be "Fossil Woods", a theme he will develop from a discussion of the Gingko Petrified Forest.

The annual dinner meeting will be held at the Reed College Commons. Mark this date on your calendar and come out and join in the good fellowship.

****

WEDDING BELLS.

On January 13th, at the home of the bride's parents, Mr. and Mrs. James L. Shaw, Miss Margaret Elizabeth Shaw became the bride of Lloyd Llewellyn Ruff. Mr. and Mrs. Ruff will be at home at 2011 NW. Lovejoy Street after April 1st. The Geological Society of the Oregon Country extends best wishes to Mr. and Mrs. Ruff, and welcomes Mrs. Ruff as a member of our Society.

NEW MEMBERS

Charles Cutress	Alder Crest Road, Milwaukie, Oregon.	
Miss Mary Spotwood Robertson	BE 8800	3132 SW Fairview Blvd.
Miss Ruby M. Zimmer	408 SE Madison St.	

CHANGE OF ADDRESS

Franklin L. Davis	460 N. Commercial St., Salem, Oregon.
Mrs. H. Mildred Stockwell	678 N. Cottage St., Salem, Oregon.

MEMBERS' ACTIVITIES

On Friday evening, January 5th, at the regular monthly meeting of Oregon Agate and Mineral Society, Mr. and Mrs. O. E. Stanley showed colored pictures and lectured on their last summer's vacation trip to Mexico.

Mr. Franklin L. Davis was elected President of the Oregon Technical Council for 1940.

****

DUES ARE NOW PAYABLE FOR THE NEXT FISCAL YEAR, WHICH BEGINS MARCH 1, 1940.

This is your responsibility; please be prompt, that the incoming officers may be able to plan their year's work.

****

Farewells to Mr. and Mrs. Ray C. Treasher were said by members of the Geological Society of the Oregon Country Saturday evening, December 16th, at the home of Dr. and Mrs. Arthur C. Jones. A large representation of the membership attended the informal reception, held to honor Mr. and Mrs. Treasher, departing the first of the year to make their home at Grants Pass.

No formal program is needed to entertain at social gatherings of the Society, but during the evening all assembled in the large living room for singing and to see some pictures. Slices of several songs from the organization's offical song sheet had been prepared by Mr. O. E. Stanley, to be thrown on a screen so that all could read the words and take part in the singing. These slides have been presented to the Society by Mr. Stanley. Dr. Jones led the singing and Mrs. A. W. Hancock played the accompaniments on the piano. Mr. Geary Kibrell presided at the projector, and afterward showed a number of interesting and beautiful slides of his own. Mr. Arthur M. Piper, president, introduced the informal program.

Coffee and little cakes were served in the dining room. Mrs. Arthur M. Piper and Mrs. Edwin T. Hodge poured.

Signatures of those present were taken, to be presented to Mr. and Mrs. Treasher as a souvenir of the occasion. Another register of signatures is being sent to New York in welcome to Mr. and Mrs. Claire Holdredge on their arrival in that city from a stay of more than a year in South America.

The committee in charge of arrangements included Mrs. Carl P. Richards, Mrs. Kenneth N. Phillips, Mrs. A. M. Piper, and Mrs. H. B. Schminky.

****

For that friendly, social contact with G.S.O.C. members, attend the Thursday noon luncheons during 1940. These meetings are informal;- beginning at 12:00 noon and permitting leaving at any time after the serving. The place is "L'Abbe's French Dinners", 910 SW Salmon Street. Luncheons are priced from 40 cents up. Get the habit. You will find 25 to 30 of your friends there at your first visit. Let's fill the room this year.

****

We wish to remind those members planning to have bulletins bound, it is time to assemble them. Arrangements have been made with same company to do the binding. The price has not been determined as yet, but the company assures us they are ready to give us the same service, and best price possible, this year.

A few pointers in preparation of your bulletins:

Remove staples.
See that bulletins are in proper order.
Some members are planning to have copies of "The Ore.-Bin" bound with News-Letter. This may be done.
Be sure to send Index to volume 5 with your bulletins.

****

EARLY MAN ON THE NORTH AMERICAN CONTINENT.

Human beings lived in North America between 10,000 and 25,000 years ago. This can be established by definite geological evidence, Drs. Kirk Bryan and Louis L. Ray, of Harvard University, told the American Association for the Advancement of Science meeting at Milwaukee, June 22, 1939.

They have been able to date the Lindenmeier site in northeastern Colorado, excavated by the Smithsonian Institution during the past five years, as equivalent in age to the third Wisconsin Glacial substage at the end of the glacial advance which it is shown by other geological evidence occurred 25,000 years ago.

At this site, believed to be a hunting bivouac of ancient, Indian-like people, Dr. Frank H. H. Roberts Jr., of the Bureau of American Ethnology, has found a large number of peculiarly shaped stone points associated with bones of an extinct variety of bison and other creatures long since vanished from North America. Elsewhere similar stone points, probably spear heads, have been found associated with mammoth bones. Presumably the so-called Folsom man trailed the bison herds as they browsed in the lush pastures which were to be found in summer in the wake of the retreating glaciers.

Dr. Roberts has returned to Colorado and expects to complete his excavations there this summer.

Folsom and Folsom-like artifacts are found scattered over most of the United States east of the Rocky Mountains, but everywhere else the finds are on the surface and the individual objects are widely scattered. Thus it is impossible to fix them in any geological setting by which an approximate date can be given them. Presumably they were lost or discarded by wandering hunters. At the Lindenmeier site, however, there is no doubt but that a considerable number of these mysterious human beings camped for extended periods, season after season.

Nothing of human craftsmanship now known on the American continent can definitely be stated to exceed the Folsom artifacts in antiquity, although a number of claims have been made and it is entirely possible that Folsom man was preceded on the continent by people of similar blood.

- Smithsonian Institution
June 22, 1939.

****

This issue contains a new Roster of the membership of this Society, which is accurate to the best of our information. It entails considerable work to keep this roster up to date, and our Social Committee has been embarrassed many times in the past by calling wrong telephone numbers. This is not fair to the ones who do the work, and it is your personal responsibility to see that your proper address and telephone number are on the Roster at all times.

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Friday Feb.23 — FIFTH ANNUAL MEETING of the GEOLOGICAL SOCIETY OF THE OREGON COUNTRY.
A business session plus A movie program.
Friends of the Society, as well as members, are invited to attend.
The business session will be brief, bright and informative! Just a few short reports outlining the work and problems of the past year, so that those present will get a general view of the Society's several fields of service and action. Newly elected officers will be introduced. Following the business, two good talkie-movies will be shown by Mr. J. Martin Weber, using his own apparatus, as he has done for us so acceptably in the past.
1st Movie:- "ADVENTURE BOUND" will take us thru Monument Valley in southeast Utah and show us the famous Rainbow Bridge; scenes in a Hopi Indian village - the oldest in U.S.A.; a 600 ft. totem pole, and other unique features in that fascinating area.
2nd Movie:-"WORK OF THE ATMOSPHERE" will show us in a graphic and picturesque manner how heat and frost, wind and rain are incessantly at work, effecting vast changes in our landscapes. An excellent picture, portraying some of the fundamental processes of geologic changes.

Friday Mar.8 — Annual Banquet
Reed College Commons.
The guest speaker will be Dr. George F. Beck, professor of geology at the Central Washington College of Education at Ellensburg, Wash. Dr. Beck's subject will be "Fossil Woods", a theme he will develop from a discussion of the Ginkgo Petrified Forest. It was largely due to Dr. Beck's efforts that this forest was set aside as a state park. He has written numerous articles on the geology of eastern Washington, on which he is a recognized authority. Dr. Beck is an interesting speaker and has a deep interest in the human side of the subject.
Besides the address of Dr. Beck, there will be other numerous interestng features worthy of the full attendance of members and their friends.

TRIPS

Sunday Feb.11 — Earl A. Marshall, leader.
Historic points of interest along Skyline Trail and on Tualatin Plains.
For log of trip turn to last page of News Letter.

****

G.S.O C's. NEW SCREEN

At a recent meeting of the Society's directors it was decided to purchase a screen which would be adequate for the showing of all types of lantern slides and moving pictures. The new screen arrived in time for Dr. Kunz to inaugurate it with the showing of his slides on it at his lecture on January 26th, and it fulfilled the best expectations regarding it.

It is a "Da-lite Glass Beaded Screen", and rolls up into a metal case. Its size is 74 inches wide by 63 inches high, which allows a standard sized lantern slide to be projected so as to cover the full area of the screen.

In the words of an enthusiastic member - "It's a honey!"

****

We are glad to report that Jack Wheeler, son of Mr. and Mrs. Chester A. Wheeler, is making a satisfactory recovery. Three weeks ago last Friday Jack received serious burns on his hands and face when a chemical preparation with which he was working, caught fire.

****

DUES ARE NOW PAYABLE FOR THE NEXT FISCAL YEAR, WHICH BEGINS MARCH 1, 1940.

****

Annual Banquet of

Geological Society of
Oregon Country

Come One - Good Eats - Come All

Stunts Music

Friday, March 8, 1940 7:00 P.M. Reed College Commons

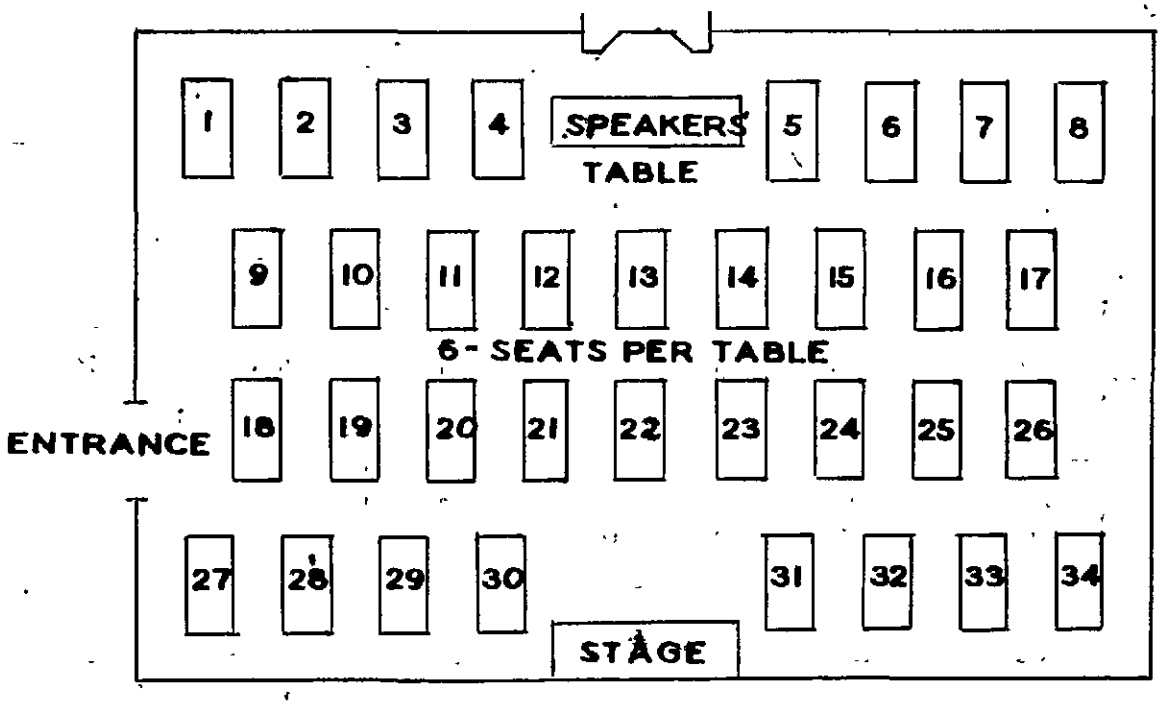
Price--$1.25 per plate

Tickets sold by plat. Refer to plat below and make your selection; don't delay making your purchase. This should be a sell out. Tickets will go on sale at the next meeting of the Society, on the evening of Friday, February 9th, 1940, Auditorium, Public Service Building. Tickets may be purchased at all subsequent meetings of the Society. Leo Simon, chairman of Ticket Committee.

Mail orders should be addressed to:

Leo Simon, c/o Sowell-Simon Studios,
531 S.W.Washington Street
Portland, Oregon

Money for tickets should accompany mail orders. Seat preference will be made as closely as possible to your selection. Tables seat six persons.



T H E A T O M I C T H E O R Y .

Science has found a new ultimate particle,
Somewhat below the electron in mass,
Which, I am told, is a rather small article,
Down in the minor sub-atomic class,
An infinitesimal,
Minus point decimal
Square root of zero, which naught can surpass!

They cannot describe it in phrases grammatical,
Lest the lay mind it confuse and perplex,
But only in terms of the high mathematical,
Like minus n power itsy-bitsy dx!
But don't let it get you;
Next week, I will bet you,
They'll find one still smaller and much more complex!

A TRAVELLER RETURNS -- AND RECEIVES A WELCOME!

At the luncheon meeting on Thursday, January 25, and again at the lecture meeting the following evening, a letter from Claire P. Holdredge was read, telling of his arrival at New York after an absence of two years in Colombia.

It will be recalled that a letter of welcome, signed by many members at the reception to the Treashers last December 16, was sent to New York to greet him when he arrived. Acknowledging this, Mr. Holdredge wrote "--- it is very nice of all of you to remember us so cordially - it made me feel especially good!"

When the letter of welcome was sent, a note was enclosed, asking him if he would be our speaker at our regular lecture meeting on March 22, (the only available date within the jurisdiction of the present program committee). To this he replied that he was delighted to receive the invitation, but, "unfortunately" he was going to California for an indefinite stay, so could not promise to be in Portland on that date.

(Note:- the next program committee is hereby recommended to contact Mr. Holdredge as a red-hot prospect for a first rate lecture at an early date. His California address is 815 La Vista Drive, Laguna Beach).

****

We wish to remind those members of the Society planning to have bulletins bound, it is time to assemble them. Be sure to send Index to volume 5 with your bulletins. Price of binding will be 40 cents this year.

****

Coquettishly, she came a trifle closer. "I did not say - " she murmured with charming embarrassment, "I did not mean - "

"Then it is not too late?" he shouted. "Oh, Electron, I will do anything for you - give up all my wild ways - give up everything - except you!"

"Oh, Nucleus", she whispered, "will it last?"

"Why Electron!" he exclaimed, "of course it will!" And so they fluoresced colorfully and spun merrily away in tangled orbits, as Nucleus sang gaily:

"Thou who whirlest in geo-
Metric, mystic paroxysm,
Hear my calling. Let there be, oh,
Let there be a synchronism
In our whirling. Whirl with me:
I'd be all the "whirled" to thee!"

****

Our sincere apology to Mr. and Mrs. Ray Treasher for listing them as still residents of Portland, after we had published their move to Grants Pass. We received a good letter from Ray last week, and we may make another mistake of like nature if it will bring such results. However, please take notice, their address is as follows - Mr. and Mrs. Ray C. Treasher, Route 2, Box 2, Grants Pass, Oregon.

Other Changes of Address.

Mr. and Mrs. Andrew Rapp	LA 4862	2202 S.E.Taylor St.
Mr. and Mrs. L. Barney MacNab		Route 12 Box 670, Milwaukie, Ore.

New Members.

Mrs. Vera Martin	BR 1181	Nortonia Hotel
Miss Hannah E. MacLeod	EA 8960	1849 SE Ankeny St.
Miss Margaret Reid	EA 8960	1849 SE Ankeny St.
Dr. & Mrs. Leon F. Ray	GA 7496	3426 NE 19th Ave.

****

In looking through the calendar of the Oregon Audubon Society, we note meetings which may be of interest to our members.

Feb.1st.- A. W. Hancock lectured on "Trees through the Geological Ages" supplemented with fossil exhibits.
Feb.15th.- Fort Rock Valley trip, Earl A. Marshall.
Feb. 29th.- Vacationing in Mexico - Birds, Flowers and Indian Life - Melia White.
April 4th.- Fossil Ancestors of our Birds, Leo F. Simon.

Dr. E. W. Lazell spoke before Oregon Agate and Mineral Society Friday evening February 2nd, 1940. His subject was Oregon's Economic Minerals.

****

NEW USES FOR OLD MINERALS.

The civilization of which you and I are a part has been aptly termed the mineral civilization. Never before has man been so dependent on minerals. Indeed, man's progress from the earliest stage of civilization - the stone age - through the copper, bronze, iron, coal, and machine ages has been possible because of an ever-increasing knowledge of minerals and their uses. Minerals have become so important that today they loom large in national and international politics.

It has been conservatively estimated that the total quantity of all mineral products extracted from the earth since the turn of the century is greater than the production in all previous history. This enormous use of minerals is the direct result of the many important contributions to our civilization which have been made during the past 50 years.

These contributions include, first, the many significant and even epoch-making scientific discoveries; second, the widespread opportunities for education on all levels, especially in this country; third, the stressing of the importance of research in our colleges and universities and in industry; and, fourth, the general mechanization of our daily life, an immediate result of the factors just mentioned.

Many of the minerals which play a very important role in modern life have long been known to man. Some of them even served as his first rude implements. Thus, primitive man's use of flint for arrowheads and stone hammers is well known. That roughly hewn pieces of flint with sharp edges were unquestionably man's first surgical instruments is affirmed by archaeologists. In early literature there are many references to flint, agate, chalcedony, chrysoprase, onyx, and jasper, all of which are varieties of quartz. Today the uses of some of them are the same as in ancient times - that is, for personal adornment and ornamentation.

It may be well to point out that sand, sandstone, and rock crystal are also varieties of quartz. As is well known, sand has long been used in the manufacture of glass, pottery, mortar, and plaster. The use of sandstone for building purposes and of rock crystal for beads, vases, and dishes is also common knowledge.

A newer use of the rock crystal variety of quartz is in the frequency control of modern radio transmitters. This is possible because the quartz crystal possesses a unique property known as piezoelectricity. This property is characterized by the fact that a pressure applied to the crystal induces electrical charges on its surface, and, conversely, charges placed on its surface cause the crystal to become distorted or strained. As applied to radio this property, called the piezoelectric effect, permits a small slab or slice of quartz to vibrate or oscillate thousands or even millions of times each second. The rate of vibration depends upon the size of the slice. The great value of quartz in this application is due to the ability of the vibrating quartz to maintain an extremely constant frequency or rate of vibration. Such quartz control is employed by nearly all the broadcasting or other radio stations, to which you may listen, in order to hold the station on its assigned frequency.

Another new use of this old mineral quartz is in the manufacture of fused quartz, or quartz glass. It was known as early as 1839 that quartz could be melted and worked like glass. For many decades, however, little attention was given

to this fact. Since quartz melts at a high temperature - about 2900° Fahrenheit - and because of other desirable properties, fused quartz is now used extensively in scientific instruments. In the form of fine fibers it is employed to suspend small and delicate parts in electrical apparatus. Because of their resistance to high temperatures and acids, tubes, flasks, and dishes of fused quartz have become extremely essential in many chemical and electrical processes. This wider use of the mineral quartz has made some of our present-day advances possible.

In the construction of houses several old minerals have found new uses. Thus, enormous quantities of the common mineral gypsum are now used in the manufacture of plaster board. This mineral has long furnished us the very important product plaster of Paris so widely employed in patent wall plasters, stucco, whitewash, crayons, casts, and in many other ways. The variety of gypsum known as alabaster has for centuries been used in Europe for vases, boxes, and statuary. Today, very attractive alabaster products in the form of dishes, lampshades and bowls, and powder boxes are being marketed in this country in increasing quantities.

To insulate our houses we are urged to use mineral wool. This substance is composed of fine interlaced mineral fibers and looks much like loose wool or cotton. Depending upon the materials used in its manufacture the product is termed rock wool, slag wool, or glass wool. In the production of this insulating material dolomite, limestone, shale, slag, and quartz sand are used. Five years ago the total value of the mineral wool produced in this country was less than two million dollars; last year it was thirty million dollars. This 15-fold increase clearly indicated the new and rapidly growing use of mineral products to help keep our houses warmer in winter and cooler in summer.

Another very old mineral is the diamond. For centuries its principal use was as a gem. Today, however, over 65 percent by weight of the annual diamond production is used in industry. These diamonds are not of gem quality. For the boring of deep holes into the earth in search of valuable mineral deposits much use is made of drill bits set with diamonds. The diamond is well suited for rock drilling because it is the hardest known substance. Some of these drill holes are nearly 2 miles in depth. Our mineral resources have been greatly increased since the introduction of diamond drilling.

Large quantities of diamonds are also used in various manufacturing industries. Rapid and precision manufacture of metal parts is a constant aim of modern industry. This is now possible because various cutting, grinding, and machining processes can be more accurately controlled through the use of diamond-set tools. These tools may be used to machine the part being fabricated, or to true the grinding wheels. They may also be used to restore the grinding surface to the wheel after it has become glazed by wear. In the automobile and airplane industries and in glass works, industrial diamonds are exceedingly important.

Still another industrial use of the diamond is in the drawing of small wires of uniform diameter. For this purpose diamond crystals are pierced with holes. The wire is drawn through holes that are successively smaller until the desired size of the wire is obtained.

In the rapid machining of metals high-speed cutting tools are used. Because the parts being machined revolve very rapidly in the lathe, the cutting tool becomes red hot. The steel of the tool must therefore be tough, have high tensile strength, and retain its temper and shape. These qualities are imparted to the

steel by the elements molybdenum, tungsten, and vanadium. Many other types of steels and alloys are being constantly developed to serve special purposes. Of these, stainless steel is perhaps best known to the general public. Nickel, chromium, beryllium, and tantalum are among the elements used in them. Naturally the minerals which contain the elements used in these modern steels and alloys have become very important commercially.

We all know that the spark plug is a very important factor in the efficient functioning of the automobile. To be successful the porcelain of the plug must be resistive to high temperatures and shock and must possess excellent insulating qualities. The minerals andalusite and dumortierite are used to impart these desirable qualities. For many years these minerals were to be found in mineral collections the world over, but they were not considered of any commercial importance until about 15 years ago. In fact, it was necessary to search for new and adequate deposits of them when research showed that they could be used to great advantage in the manufacture of spark plug and chemical porcelains. Such deposits were discovered in California. These deposits now furnish many tons of andalusite and dumortierite annually so that our automobile and other gasoline motors may run smoothly.

It is well known that when flint and steel are rubbed together sparks fly. This principle is applied in the small automatic lighters which are in common use. The flint in these lighters is not, however, the same as the flint referred to earlier. It is an alloy containing 70 percent of the element cerium and 30 percent of iron. When this alloy is scratched minute particles are removed from the larger mass and ignite in air. These sparks set fire to the easily combustible liquid in the lighter. The minerals cerite and orthite supply the cerium which is so essential in these lighters.

New uses are constantly being found for the old mineral mica, sometimes called isinglass. It was among the first transparent materials used for windows. Its use in stove doors is familiar to many. Mica possesses an unusual combination of physical and electrical properties. It can be cleaved or split into extremely thin sheets, which are very elastic and transparent. It is also an excellent nonconductor of heat and electricity, and its resistance to decomposition is high. Because of these properties mica is today absolutely essential in radio condensers, magnetos, telephone equipment, and electric appliances. Powdered mica is used for pipe and boiler covering; also as a lubricant, as artificial snow, and in fancy paints and glistening wall papers. One of the very recent applications of this old mineral has been the spraying of gigantic exposition buildings with pulverized mica, so that its glistening flakes may produce spectacular effects when powerful colored lights are thrown upon the buildings at night.

For 25 centuries it has been known that some minerals, after exposure to sunlight, will glow or become luminous in the dark. This property of luminescence may also be induced by heating, or by exposure to ultra-violet, cathode, or X-rays, or to radium emanations. Today the list of such minerals is quite long. The diamond, ruby and sapphire, calcite, willemite, and scheelite have this property. The luminescent colors often differ markedly from the natural. Indeed, spectacular effects may be observed. Some minerals glow, or fluoresce, only during the exposure, while others will continue to glow, or phosphoresce, after the excitation has ceased. Recently, very attractive exhibits have been installed in museums so that the general public may become more familiar with this property. At mines in New

Jersey and Nevada, this property is now employed to effect a more complete separation of the luminous from the nonluminous minerals in the ores.

Undoubtedly some who are listening remember the widespread use of the so-called crystal detectors in the radio-receiving equipment of 15 or 20 years ago. For this purpose the minerals galena, iron pyrites, and zincite were commonly used. Although employed to a lesser extent today, the use of these minerals still continues as detectors or rectifiers, especially in the more recently developed microwave radio equipment.

In spite of frequent financial, economic and political upsets, man has made much progress through the ages. In this progress man's ever-increasing knowledge of the properties, occurrences, and uses of minerals has been and will continue to be a significant contributing factor.

****

The above article, "New Uses for Old Minerals", by Dean Edward H. Kraus, was the concluding article in a series of eight radio addresses given by the Geological Society of America under the theme "Frontiers of Geology".

****

LOG OF FIELD TRIP FOR FEBRUARY 11, 1940.

Leader - Earl A. Marshall

Miles

0.0 Leave SW Front and Yamhill, 9 a.m.
Go by way of SW Jefferson Street and Canyon Road to

3.9 Sylvan. Leave cars on north side of road or east side of skyline Boulevard. Walk south down Sholes Ferry Road about 600 feet and cross barbed wire fence to west and cross field to "Old Road - Portland to Tualatin Plains" as described in Government Field Notes of 1851. About 1000 feet of this old road can still be found. Return to cars and take Skyline Boulevard to north from Sylvan.

4.9 Home of Aubrey Watzek which is over the "Old Mountain Road", described in Government Field Notes of the Base Line as road "Portland to Tualatin Plains". This road was exactly on top of the ridge and went through K.O.I.N. property to the west. No stop will be made.

8.2 Junction of Skyline Road and Thompson Road. Stop and park. Nearby is old fur trappers' trail to the Tualatin Plains used by Joe Meek and others in the 40's. We will hike down this old trail for 3/4 of a mile to the "Old Deserted Orchard" - now in a fir forest. Return to cars and continue on Skyline Boulevard.

11.1 Original Springville Road - road to Tualatin Plains when Springville was rival to Portland. Portland won out because Canyon Road and Mountain Road had better grades.

12.5 Old road Linnton to Tualatin Plains, built by McCarver and Burnett in the winter of 1843 or 1844, crosses Skyline Boulevard here.

19.8 Viewpoint. Here we will look down on Sauvies Island at the site of Hudson's Bay Co. dairy ranch and Fort William. The route of the Hudson's Bay Co.'s Logie Trail, built in 1834, will be pointed out.

21.0 Probably will be about noon.
Nearby is old spring (cannot be used for water now) where usual noon-day camp of Hudson's Bay Co.'s pack trains was made.

In the afternoon, party will descend Logie Trail Road to Tualatin Plains, visiting "oldest Protestant Church structure west of the Rocky Mountains". Here are buried several of the famous fur trappers. We will pass by the Donation Land Claim of Joe Meek, the most famous of Oregon Mountain Men, and visit the old Presbyterian Church, where Joe Meek and other pioneers are buried. The trip will end in the grave yard. Latter part of trip has not been logged.

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 4 PORTLAND, OREGON Feb. 25, 1940

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GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

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THE GEOLOGICAL NEWS-LETTER

Official Publication of the

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Editor-in-Chief and Business Manager

Raymond L. Baldwin
345 U. S. Court House
Portland, Oregon

Associate Editors

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Arthur M. Piper	C. D. Phillips
Ray C. Treasher	K. N. Phillips

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00.

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ - _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

Lectures

ALL LECTURES ARE HELD IN AUDITORIUM OF PUBLIC SERVICE BUILDING
SIXTH AVENUE AND TAYLOR STREET

Friday Feb.23 — FIFTH ANNUAL MEETING of the GEOLOGICAL SOCIETY OF THE OREGON COUNTRY
A business session plus A movie program.
Friends of the Society, as well as members, are invited to attend.
The business session will be brief, bright and instructive! Just a few short reports outlining the work and problems of the past year, so that those present will get a general view of the Society's several fields of service and action. Newly elected officers will be introduced.
Following the business, two good talkie-movies will be shown by Mr. J. Martin Weber, using his own apparatus, as he has done for us so acceptably in the past.
1st Movie:- "ADVENTURE BOUND" will take us thru Monument Valley in southeast Utah and show us the famous Rainbow Bridge; scenes in a Hopi Indian village - the oldest in U.S A.; a 600 ft. totem pole, and other unique features in that fascinating area.
2nd Movie:- "WORK OF THE ATMOSPHERE" will show us in a graphic and picturesque manner how heat and frost, wind and rain are incessantly at work, effecting vast changes in our landscapes. An excellent picture, portraying some of the fundamental processes of geologic changes.

Friday Mar.8 — ANNUAL BANQUET.
The guest speaker will be Dr. George F. Beck, professor of geology at the Central Washington College of Education at Ellensburg, Wash. Dr.Beck's subject will be "Fossil Woods", a theme he will develop from a discussion of the Ginkgo Petrified Forest. It was largely due to Dr. Beck's efforts that this forest was set aside as a state park. He has written numerous articles on the geology of eastern Washington, on which he is a recognized authority. Dr. Beck is an interesting speaker and has a deep interest in the human side of the subject.
Besides the address of Dr. Beck, there will be other numerous interesting features worthy of the full attendance of members and their friends.
Toastmaster: - Dr. Adolph Weinzirl.

Friday Mar.22 — Subject: THE ROLE OF THE ASSAYER.
Speaker: Mr. Leslie L. Motz, Metallurgical Chemist, Oregon State Department of Geology & Mineral Industries.
Mr. Motz will tell us of the purposes, principles and practice of sampling mineral deposits. He will illustrate his talk with a motion picture of his own taking, entitled "The Assayer - Key Man of the Mining Industry", which shows the procedure of the State Assay Laboratory at Baker, Oregon. Geology as a pure science, by itself, is useless. It needs a "follow-up", such as that provided by the assayer, to render it of practical value to man. The geologist tells where to get it; the assayer tells what it is when obtained.

Below is a copy of a letter addressed to our Society thru Mr. A.M.Piper, from the Department of Geology, University of Oregon.

"An 'open house' for Oregon mineral and geology societies is being sponsored by Condon Club, geology and geography honorary of the University of Oregon, to be held in Condon Hall, on the campus, Sunday, March 10th, at 1 P.M.

"Displays of Oregon minerals and rocks will be featured, and collections from other localities will also be shown. The geology department and the Oregon Museum of Natural History will be open for your inspection.

"There will be other events for the special interests of all Oregon mineralogists. Dr. Staples will give a lecture on minerals, illustrated by his collection of thin-section lantern slides. Dr. Smith, head of the department, will explain museum and other exhibits.

"We cordially invite and urge the members of the Geological Society of the Oregon Country to attend the 'open house'. We also invite you to bring samples of minerals which you would like to display, or to have identified.

- Committee in Charge: Warren D. Lomax and Wilbur Greenup".

****

Following is a list of radio talks to be made by staff members of the Oregon State Geology Department over station KOAC at Corvallis. These talks will interest members of the Geological Society.

Speaker	Title	Date and Time	
E. L. Packard	Building the Geologic Column in Oregon.	Feb.22	9:00 p.m.
E. L. Packard	Ancient Seas in Oregon	Mar.21	9:00 p.m.
E. L. Packard	Outlines of History of Life in Oregon	Apr.25	9:00 p.m.
E. L. Packard	Geologic History of Horses.	May 30	9:00 p.m.
I. S. Allison	Origin of Mountains	Mar.13	9:45 p.m.
I. S. Allison	Changes of Sea Level	Apr.9	9:45 p.m.
I. S. Allison	Searching for Petroleum	Apr.23	9:45 p.m.
E. L. Packard	Ancient Marine Reptiles of Oregon	May 1	9:45 p.m.
E. L. Packard	Flying Lizards	May 8	9:45 p.m.
E. L. Packard	Mammals of John Day 30,000,000 Years Ago.	May 15	9:45 p.m.
E. L. Packard	Camels of Ancient Oregon	May 22	9:45 p.m.
E. L. Packard	The Life of Oregon During the Ice Age.	May 29	9:45 p.m.

****

Annual Banquet of

Geological Society of
Oregon Country

Come One - Good Eats - Come All

Stunts Music

Friday, March 8, 1940 7:00 P.M. Reed College Commons

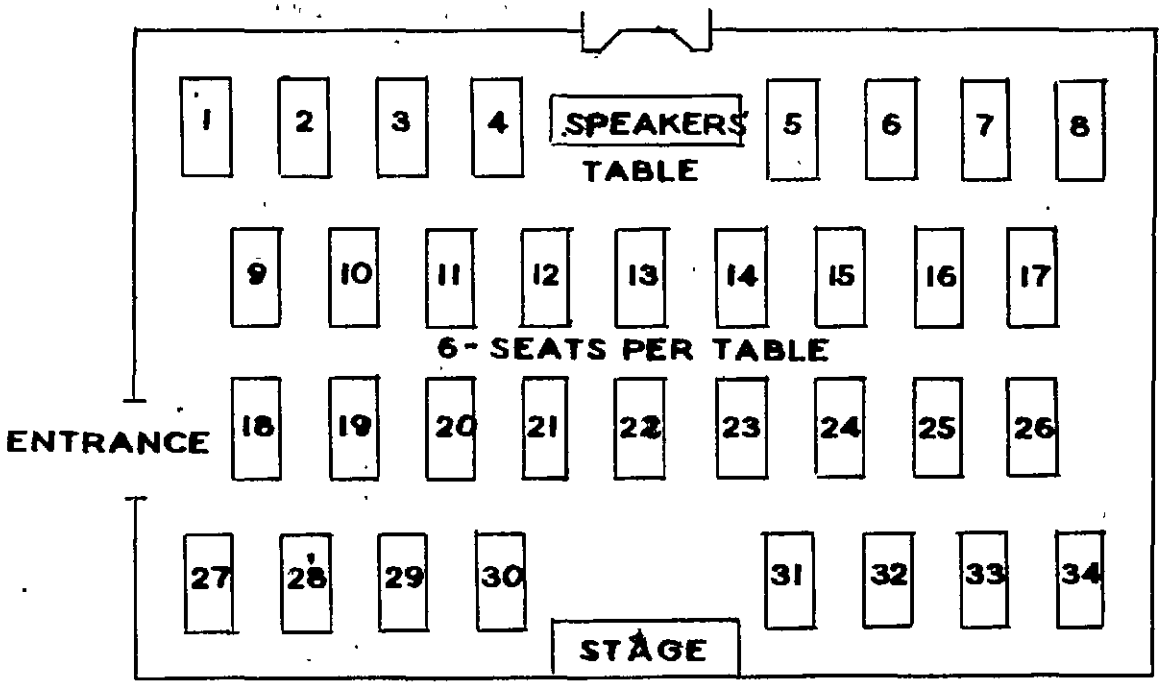
Price--$1.25 per plate

Tickets sold by plat. Refer to plat below and make your selection; don't delay making your purchase. This should be a sell out. Tickets will go on sale at the next meeting of the Society, on the evening of Friday, February 9th, 1940, Auditorium, Public Service Building. Tickets may be purchased at all subsequent meetings of the Society. Leo Simon, chairman of Ticket Committee.

Mail orders should be addressed to:

Leo Simon, c/o Sowell-Simon Studios,
531 S.W.Washington Street
Portland, Oregon

Money for tickets should accompany mail orders. Seat preference will be made as closely as possible to your selection. Tables seat six persons.



Y E E D I T O R R E G R E T S !

On looking thru the last issue of the NEWS-LETTER (vol.6 no.3) most members, doubtless, were mystified to find on page 13 what seemed to be a pointless jargon of inexplicable nonsense! As it appeared, it was that - and nothing more. But, there is a reason for all things and, in this case, it is that, thru mischance, a whole page was omitted. It was doubly unfortunate that it should have occurred with this particular article, which is in the nature of a satire on the physics of matter, a subject so capably set forth by Dr. Kunz in his recent lecture. However, in this issue the entire story appears and, we hope, our readers will enjoy it and at the same time forgive us for this unintentional exhibition of a very human trait, the making of a mistake.

Regret is also expressed for the omission of the acknowledgement of authorship and source of those two clever verses under the caption "The Atomic Theory" which appeared on page 12 of the same issue. They are by "H.S.G." and came out in the Oregon Journal about two years ago.

****

We really think we are getting somewhere with our mailing list. Formerly after the roster was out we learned by grapevine route when addresses were wrong. Not so this year - we are told in no uncertain terms. That's the way we like it. Here are some corrections to be made on your roster.

Mr. and Mrs. E. N. Bates	BE 3038	5639 S.W. Menefee Drive
Mr.and Mrs.Everett E.Williams	MU 1270	2338 NE 17th Ave.
Miss Ruby M. Zimmer	TA 2064	805 SE 60th Ave.
Mr. and Mrs. J.Dean Butler	Oak Grove 3 - 7967 - Route 10, Milwaukie	

New Members

Mr. and Mrs. John Eliot Allen	BR 2276	329 SW Oak Street.

****

AN INFINITESIMAL ROMANCE.

Being the substance of a dream (if dreams have substance) which a member had after he (or she?) had listened to the lecture dealing with the atomic theory of matter, which Dr.Kunz presented before the Society on Jan.26.

By The Dreamer.

(Prefatory Note:- the distance between the nucleus and the electron is about half a hundred-millionth of a centimeter. The size of an electron is about a hundred thousandth of the diameter of its orbit. The electron goes round its small orbit with great rapidity; in fact its velocity is about 1,400 miles per second. To attain this speed it has to go round its tiny orbit about seven thousand million times in a millionth of a second. Science Text Books).

"Electron", he sighed softly, "oh Electron".

She heard and whirled gently near. "I am here, Nucleus", she whispered. Petite and beautiful she was as electrons go, but decidedly giddy.

"I have something to say to you", he observed as she slowed somewhat in her whirling. "We have known one another, we have revolved together for hundreds of years and you attract me. Sweet speck of cosmos, be mine, let us unite, I could make you so happy! I'm positive - beg pardon," he broke off suddenly as he bumped into a passing atom, "excuse me, it was my fault".

"Tut!" snapped back the offended one, "why can't you look where you are going? Must be in love, I should think, to act so eccentrically; besides, you are not positive, you're negative". He recovered his balance and, revolving rapidly disappeared in a crowd of atoms.

"Strange fellow", remarked Nucleus as he made a few million revolutions, "if I were not the smallest conceivable portion of matter I would split with laughing".

"How rude he was", said Electron, gyrating daintily.

"It's the way those fellows usually behave, pet", replied Nucleus, "he is of no account, and will be broken up someday". Then, after a pause, he resumed: "He was right, though - I am in love - and with you!"

Electron blushed, moved over to an adjacent molecule, and toyed with her orbit. He approached her, poising with perfect equilibrium.

"But", she said shyly, "there are others - "

"Others!" yelled Nucleus, spinning in dizzy desperation, "Ha! perhaps several others! Oh, cruel world to treat me thus!" and, in his rage, he shot off positive charges into space.

She turned pale and moved away a ten-millionth part of a centimeter.

"Be careful", he hissed, "don't drive me too far!"

Coquettishly, she came a trifle closer. "I did not say -- " she murmured with charming embarrassment, "I did not mean - "

"Then it is not too late?" he shouted. "Oh Electron, I will do anything for you -- give up all my wild ways -- give up everything - except you!"

"O Nucleus!" she whispered, "will it last?"

"Why,Electron," he exclaimed, "of course it will!" And so they fluoresced colorfully and spun merrily away in tangled orbits, as Nucleus sang gayly -

"Thou who whirlest in geo-
Metric, mystic paroxysm,
Hear my calling. Let there be, oh,
Let there by a synchronism
In our whirling. Whirl with me;
I'd be all the "whirled" to thee!"

****

FREDA METEORITE.

One of the finest examples of a meteoric iron exhibiting flight sculpturing has just been added to the collections of the Smithsonian Institution. Meteorites fall at enormous speeds and as they enter the earth's atomosphere they are greatly reduced in size as well as modified in shape. Stone meteorites more commonly exhibit streamlining and delicate fluting by the atmosphere than do the iron meteorites.

This meteorite was found in 1919 by Henry G. Meyer, of Freda, North Dakota, while breaking the prairie sod. The date of its fall is unknown, but since this specimen is free from any weather effects it is certainly a comparatively recent fall.

The weight of this individual iron meteorite is about one-half a pound, but it is a very important specimen because of its physical shape. The Freda meteorite is the fifth one to be recovered in North Dakota.

- Smithsonian Institution.

****

P L A N E T S I N A R R A Y.

By Carl Price Richards.

The last few days in this month and the first few in next (February and March 1940) will be famous for a display of all the planets in the evening sky at the same time. At no time within the memory of man has there ever been seen such an array of the planets, nor will anything approaching it in symmetry and order appear again within the lifetime of anyone now living.

In their eternal peregrinations about the sun the nine major planets of the solar system assume an infinite number of relative positions. Five of the planets are seen without telescopic aid - indeed, they are outstanding objects among the myriad points of light one sees in the night sky. It so happens that, around the end of February, these five will be spread across the evening sky, and, to make the occasion still more remarkable, three others will be observable at the same time with suitable telescopic aid. That makes eight. What about the ninth? Well, that also will be visible, for we will be standing on it - old Mother Earth herself! Thus the roll call will be complete, with no absentees!

The order in which they occur across the sky is important, because, unless one knows that, it might be difficult to distinguish certain ones from others, as their color and brilliance are somewhat similar.

First to be noted is the smallest and most elusive planet of them all, Mercury. Being an interior planet, and situated little more than a third of our distance from the sun, it is never seen very far from the sun in angular distance. In these latitudes, where "twilight hours" prevail, it is safe to say that relatively few people have ever seen Mercury. In the tropics, however, where the sky is dark a few minutes after sundown, and till very shortly before sunrise, the little planet becomes a conspicuous object and is, therefore, more generally observed.

On February 28, Mercury attains its greatest elongation east of the sun, hence it is fairly favorably situated for seeing till about an hour after sunset. Given a clear sky, therefore, it will be readily discernible as a star of about the first magnitude shining in the twilight. If one can observe it thru a telescope, it will be seen to have "phase", having the shape of the moon at first quarter.

Above Mercury, spread out along the ecliptic, (which, at that time, extends up from the horizon at an angle of about 70 degrees), will be seen the other planets, each about 10 degrees of subtended angle from the next. They will appear in this order - Mercury, Jupiter, Venus, Saturn, Mars. Then, still about another 10 degrees farther east, in the constellation of Aries, will be Uranus, an object of about the 6th magnitude, or just on the borderline of naked eye vision.

Note that this arrangement is the more unique in that it constitutes an alternating pair of sequences of the near and distant planets, each sequence in its order of distance. Thus - Mercury, Venus, Mars; then, interspaced with these - Jupiter, Saturn, Uranus.

Of the two remaining planets, Nepture, of 8th magnitude, is in the consellation Virgo, and, at that hour, will be well above the horizon in the east. The other is little, distant Pluto, a very faint object of about the 15th magnitude, which

will then be nearly overhead in the constellation Cancer. Both these, however, require ample telescopic power to be seen, but their presence above the horizon at that time renders complete the unique phenomenon of all the major planets being on array simultaneously.

By far the brightest is Venus, which, like Mercury, has "phase" when observed thru a telescope, as it, too, is an interior planet, revolving about the sun at about two thirds of our distance from it. The diameter of Venus is 7,575 miles, or very nearly the same as that of the earth.

Next brightest is Jupiter, a familiar object to everyone, being, with the exception of Venus, the brightest celestial object apart from the sun and moon, and prominent in the night sky for more than half of every year. The largest of all the planets, being 88,000 miles in diameter, Jupiter revolves about the sun once in twelve years, at an average distance of 483 million miles.

Mars and Saturn will appear of about equal brilliance, in spite of the fact that they differ vastly in size, distance and form. Mars is only 4,215 miles in diameter and, at the time of this spectacle, about 160 million miles distant from the earth. Saturn, on the other hand, is 75,000 miles in diameter and some 920 million miles distant from us. His ring system, adding to his reflecting area, helps to compensate for the greater distance, resulting in about equivalent intensity of brightness to that of Mars. Their colors differ appreciably, however; Saturn shines with a calm, white light, whereas Mars is of a ruddy hue.

So, let us absorb this spectacle as it passes, learning from it something of the majesty of the celestial mechanism. It is fitting that we, as geologists, should not confine our thoughts to the structure and nature of the earth here under our feet, but that we should occasionally gaze upward and outward in contemplation of our neighbors in space. They wield their influences upon us - even others than those manifested in our ocean tides - and an extension of our understanding of these neighbors, of their nature as well as their movements, will assist towards a fuller understanding of this geological old earth of ours!

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STRATEGIC MATERIALS - and OREGON MINERALS.

Lecture by E. K. Nixon.

This discussion will consider first Strategic or War Materials in general and their relation to the probable course of events in the present conflict, and later Strategic Materials and Minerals in some detail, together with an outline of Oregon's position in the production of strategic and other minerals.

If you were given the chore of classifying all the nations of the earth as to greatness and power, you would first derive an empirical formula based on experience, say, in evaluating a business operation. Your formula would take the form of an equation in which the numerator would be a series of sums, each the product of one factor by another - you would multiply the agricultural resources of the particular nation by the cleverness of its people to utilize those products. Then you would multiply the capacity of the people of that nation to utilize its mineral resources by the total of its several usable mineral products. After you had made these various multiplications you would add the accumulated wealth - of various types - of the nation and divide the entire numerator by the denominator of the equation. This denominator would be a figure or factor that would take intangibles not calculable in terms of dollars or tons of ore or pounds of wool. It would include favorable or unfavorable location of the nation, its climate, its form of government, the relative stage of its peoples' civilization, and other variables.

By such a process of comparison of nations you would find that they fall, in general, into the Haves and the Have Nots, as they did for Cervantes in his Don Quixote. Some of the nations might have inexhaustible mineral or agricultural resources but might lack the enlightened type of people to utilize them properly; other nations, some of the smaller ones, might have enlightened people and clever technicians but lack the mineral and other resources - France, Italy, and Belgium for example. Great Britain, for example, has an enlightened people and vast resources, but they are scattered at great distances among the Dominions and cannot be delivered quickly to the mother country, a small island that is vulnerable by air from a nearby enemy nation.

In your study of nations you would find not only what each nation has in abundance, but what it lacks . . those things which are critical or vital in time of emergency or war. We all recall the story that the "battle was lost for want of a horshoe nail". That may be far-fetched, but it is very easy indeed to see how a nation might be lost for want of a few boatloads of nitrate or manganese or chromium.

Now let us see what our deficient or Strategic Materials are. By definition they are those materials essential to the national defense for the supply of which in war, dependence must be placed in whole or in large part on sources outside the continental limits of the United States.

Specifically there are 21 of them, as follows:

Aluminum	Manganese	Quicksilver
Antimony	Manila fiber	Quinine
Chromium	Mica	Rubber
Coconut shells	Nickel	Silk
Coffee	Opium	Tin
Hides	Optical Glass	Tungsten
Iodine	Quartz crystal	Wool

That is the list as agreed on by the Commodities Division, Army and Navy Munitions Board. Twelve of these, or more than half, are mineral raw materials.

How could we assure ourselves of a supply of these raw materials in time of dire need? By any of three methods:

1. By accumulation of reserve stocks held under government supervision.
2. By "upping" domestic production through subsidies, price concessions, or, in the case of certain materials, through tariffs.
3. By encouraging the use of substitutes or by developing and manufacturing substitutes.

Of the Strategic Materials just enumerated let us dispose of the non-mineral items first and then consider the strategic minerals.

Coconut shells: The best charcoal for gas masks is made from coconut shells, which are, therefore, strategic. We produce none of this commodity. It comes principally from Ceylon, India, and the Phillipine Islands.

Coffee: Coffee officially is classed as a luxury food and so might be eliminated. It is included because without it the morale of an army might suffer. We produce none of it, of course.

Hides: Although we have more cattle than any other western hemisphere nation, we import one-third of our consumption of hides. Substitutes for leather are growing rapidly in rate of production, so this might be eliminated with no great hardship as a war deficiency material.

Iodine: No satisfactory substitute has been found for iodine, which is a most important drug for field and general use. Formerly 80 per cent of it was produced in Chile and Scotland from kelp or sea weed. Now the United States is the second largest producer, deriving its supply from brine from certain salt wells. It is not unlikely that in an emergency we could produce sufficient for our needs.

Manila fiber: For the manufacture of naval cordage there is no known satisfactory substitute for manila fiber, which is obtained from the stem of a banana-like plant in the Phillipine Islands. It has practically replaced hemp in the manufacture of ropes as it floats and resists the action of salt water. Who knows what kind of synthetic substitute may be developed by our chemists for this material?

Opium: Some twenty alkaloids are manufactured from opium, each with its own use as a drug to reduce pain. The Narcotics Division of the U.S.Treasury Department probably has enough opium on hand to last any ordinary emergency. All of it is imported, of course.

Quinine: Quinine is a specific in the treatment of malaria and has no satisfactory substitute. It could be made available in proper quantity only by accumulating stocks.

Rubber: In the natural state rubber is not produced in the United States, altho we use more than half the entire world production. We cannot get along without rubber either in peace or war. Ninety-four percent of all rubber comes from the East Indies. Britain controls sixty-five percent of the production and The Netherlands twenty percent; the remaining fifteen percent is controlled by France, Belgium, and Japan.

(To be continued)

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

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I am particularly interested in the following branches of Geology: _____

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Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

Annual Banquet of

Geological Society of
Oregon Country

Come One - Good Eats - Come All

Stunts Music

Friday, March 8, 1940 7:00 P.M. Reed College Commons

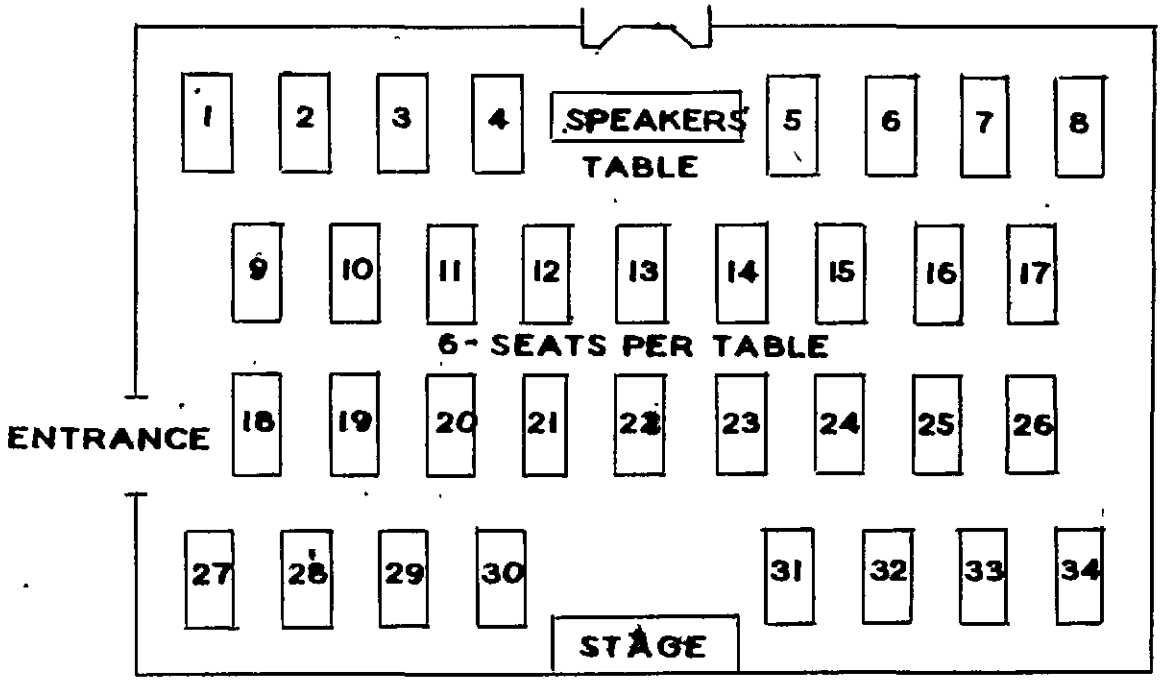
Price--$1.25 per plate.

Tickets sold by plat. Refer to plat below and make your selection; don't delay making your purchase. This should be a sell out. Tickets will go on sale at the next meeting of the Society, on the evening of Friday, February 9th, 1940, Auditorium, Public Service Building. Tickets may be purchased at all subsequent meetings of the Society. Leo Simon, chairman of Ticket Committee.

Mail orders should be addressed to:

Leo Simon, c/o Sowell-Simon Studios,
531 S.W.Washington Street
Portland, Oregon

Money for tickets should accompany mail orders. Seat preference will be made as closely as possible to your selection. Tables seat six persons.



ANNOUNCEMENTS

Lectures

ALL LECTURES ARE HELD IN AUDITORIUM OF PUBLIC SERVICE BUILDING SIXTH AVENUE AND TAYLOR STREET.

Friday Mar.8 — ANNUAL BANQUET

The guest speaker will be Dr. George F. Beck, professor of geology at the Central Washington College of Education at Ellensburg, Wash. Dr. Beck's subject will be "Fossil Woods", a theme he will develop from a discussion of the Ginkgo Petrified Forest. It was largely due to Dr. Beck's efforts that this forest was set aside as a state park. He has written numerous articles on the geology of eastern Washington, on which he is a recognized authority. Dr. Beck is an interesting speaker and has a deep interest in the human side of the subject.
Besides the address of Dr. Beck, there will be other numerous interesting features worthy of the full attendance of members and their friends.
Toastmaster:- Dr. Adolph Weinzirl.

Friday Mar.22 — Subject: THE ROLE OF THE ASSAYER.

Speaker: Mr. Leslie L. Motz, Metallurgical Chemist, Oregon State Department of Geology & Mineral Industries.
Mr. Motz will tell us of the purposes, principles and practice of sampling mineral deposits. He will illustrate his talk with a motion picture of his own taking, entitled "The Assayer - Key Man of the Mining Industry", which shows the procedure of the State Assay Laboratory at Baker, Oregon. Geology as a pure science, by itself, is useless. It needs a "follow-up", such as that provided by the assayer, to render it of practical value to man. The geologist tells where to get it; the assayer tells what it is when obtained.

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NEW MEMBER

T. K. Miller	AT 0254	1211 N.W. Glisan St.

CHANGE OF ADDRESS

Harry L. Clark	2424 N.E. 12th Ave.

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DUES ARE NOW PAYABLE!

GEOLOGICAL EXPLORATION OF THE FORTIETH PARALLEL

Vol. II - Descriptive Geology.

The steadily growing library of the Society has lately been enriched by a donation of Vol.II, Descriptive Geology, of the 7-volume work published as U.S.Army Professional Paper no. 18, Geological Exploration of the 40th Parallel (1877). This 889-page volume, with numerous full-page illustrations from photographs, is the gift of Mr. W. R. Underwood, 3925 SE Franklin St., Portland. The book embodies a section of the report of what is generally known as the "King Survey", the first large-scale geologic study undertaken in the United States. A brief statement of the history of that undertaking may be of interest.

In 1866, Clarence King, a young enthusiast in geology, who had gained some experience with the Geological Survey of California, conceived the idea of connecting the geology of the East with that of the West with a topographical and geological survey across the Rockies and the western plains, in the vicinity of the 40th parallel of latitude. The recent subsidizing of the Central Pacific and Union Pacific Railroads lent interest and gave impetus to the project. With no credentials except letters of introduction from California friends, he impressed General Humphreys, Chief of Engineers, and members of Congress so well with the merits of the plan and with his own personality that on Mar.2, 1867, Congress authorized the Secretary of War to "direct a geological and topographical exploration of the territory between the Rocky Mountains and the Sierra Nevada Mountains, including the route or routes of the Pacific Railroad ---". (14 Stat.L. 457). Appropriations were made by this and later sessions of Congress until a total of about $400,000 had been expended from 1867 to 1872. King did some field work in 1873, and office work continued until 1879.

Although the finances were obtained from the War Department, the work was in charge of civilian geologists under the personal direction of King - (at the age of 25 when the work began, believe it or not!) - and the only military aspect of the survey was the military escort of 20 men required to give protection from hostile Indians. King's principal assistants were geologists S. F. Emmons and Arnold Hague; there were four topographers, one botanist, one zoologist, a photographer, medical attendants, teamsters, cooks, and laborers. King was instructed to examine and report upon geological structures, geography, and natural resources of the region lying between meridians 105 and 120 west longitude, near the 40th parallel and extending north and south as far as practicable, to collect data for detailed maps of mining districts, and to conduct systematic meteorological observations. Maps were prepared on a scale of 4 miles to the inch with 300-foot contours, using as a base "a continuous system of triangulation carried from mountain top to mountain top, over the whole extent of our work, by the theodolite observations upon stone monuments. These triangles have been located astronomically, and their distances computed from a base and check base ----". (This system is essentially the same as that used with greater refinement today). Elevations were determined by barometric observations and extended by compass and gradienter. Many collections of minerals, fossils, rocks, and ores were made and deposited in the National Museum.

The results of the work were published as U.S.Army Professional Paper no.18, in 7 volumes, entitled: (1) Systematic Geology, (2) Descriptive Geology, (3) Mining Industry, (4) Ornithology and Paleontology, (5) Botany, (6) Microscopical Petrography, and (7) Odontornithe. In summing up his work King said:

"Readers are recommended to bear in mind that this is not a geological survey but a rapid exploration of a very great area in which literally nothing but a few isolated details was before known. Unmapped, unstudied, it was terra incognita; and if in our difficult and arduous campaign we have done no more than outline the broader features of the geology, we have at least accomplished that".

Vol.II is what its name implies, Descriptive Geology (topography, geography, structure, petrography, geologicl history, etc.) of the region, divided into 5 areas: (1) Rocky Mountains, (2) Green River Basin, (3) Utah Basin, (4) Nevada Plateau, and (5) NEvada Basin. It is written by Emmons and Hague, under the direction of King. Fossils found are listed and some are briefly described. Numerous chemical analyses of rocks, sediments, and lake waters are given. The volume is embellished with 25 full-page lithographed reproductions of photographs.

It is impossible in the confines of the Bulletin to review adequately a work of this magnitude. Members of the Society who are interested may borrow the volume by arrangement with R. L. Baldwin, librarian.

The Society's thanks go to Mr. Underwood for this splendid donation.

-- Kenneth N. Phillips

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DOINGS OF MEMBERS.

A. W. Hancock addressed Mazamas at their Club room, Wednesday Evening, Feb 21st on "The Parade of Trees Through the Centuries", illustrating his talk with samples of wood and leaf imprints.

Dr. and Mrs. Courtland L. Booth entertained the Alumni Association of Oberlin College at their home, 2444 SE Clinton St., on Friday March 1st, in honor of two Oberlin graduates, Rev. and Mrs. Ira L. Gillet, missionaries of the Methodist Episcopal Church here on furlough from their station in Portuguese East Africa.

At a meeting of Nebraska State Social Club at the Y.M.C.A. building on Saturday evening, February 24th, Mr. and Mrs. O. E. Stanley showed colored pictures and lectured on their trip to Mexico last summer. Mr. and Mrs. Stanley also showed their pictures Wednesday Feb.28th at the Heathman Hotel, at a reunion of the Cornell University Alumni honoring Dr. McGee, President of Cornell.

A timely full page article by Dr. Edwin T. Hodge appeared in the Northwest Magazine section of the Oregonian, Sunday Feb.18th, "Looking forward - will steel come to Portland?" Columbia Estuary is logical place for its development.

The Morning Oregonian of Feb.21st carried an article saying that the Sierra Iron Company, a Nevada corporation with California financing, had acquired land and would locate a plant at Vancouver, Washington.

Earl A. Marshall was leader of the Mazama trip to Sauvies Island Sunday Mar.3rd.

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STRATEGIC MATERIALS - and OREGON MINERALS

Lecture by E. K. Nixon (continued)

Dupont is coming into production with duprene - a synthetic product made from air, water, and coal - which is superior to natural rubber in many ways but costs several times more. Cost of production will be lowered as production is increased, but nevertheless rubber is a real strategic material.

Silk: A luxury product in peace times, silk has several important uses in war. The most important two are for parachutes and for powder bags for the big guns. Dupont's duprene presumably would be a satisfactory substitute in war time.

Wool: The most important animal fiber is wool; the health of civilians and soldiers would depend on having plenty. The United States produces about two-thirds of its consumption and in time of war could increase production and probably get by.

Summing up, rubber is the one non-mineral commodity for the lack of which we would be sorely embarrassed in time of war or emergency.

Now taking up the Strategic Materials of mineral nature.

Aluminum: Being used extensively in airplanes, aluminum is therefore a strategic war mineral. There is none in Oregon.

Antimony: There are few antimony mines in the United States, though some is recovered in the smelting of lead. Sixty-five percent comes from China and fourteen percent from Mexico. It is used in batteries.

Chromium: In 1918 Oregon and California produced 80,000 tons of chromium. Much of it comes from Russia, South Africa, and New Caledonia. It is used for rust-resisting and stainless steel, steel alloys, projectiles, armor-plate, and other products.

Manganese: The United States produces only five percent to six percent of the world's manganese, which comes mainly from Russia, Africa, and Cuba. It is used for manufacturing steel and alloys for the needs of the Army and Navy.

Mica: Eighty percent of the world's mica comes from India; only about five percent from the United States. It is used in automobiles, airplanes, and radios. It is an indispensable war mineral. Lately it has been claimed that a synthetic material has been discovered.

Nickel: The United States produces no nickel, though cannon and armor-plate cannot be made without it. We should stock it.

Optical glass: Bausch and Lomb are the only domestic producers of optical glass. It requires skilled but cheap labor.

Quartz crystal: This comes from Brazil; there is none in the United States.

Quicksilver: Fulminate, calomel, and corrosive sublimate are derived from

quicksilver, of which the United States produces about 15,000 flasks a year. Oregon is second only to California in production. It is also obtained from Italy, Spain, and Mexico.

Tin: There is no tin produced in the United States, and the entire supply is imported. Ninety-five percent is used by the canning industry. It is obtained from Malay and Bolivia. Alaska may produce some this coming year.

Tungsten: China produces sixty-eight percent of the world's supply of tungsten. The uses are for high-speed tool steel, alloys, radios, and electric-light filaments. In case of war we probably could get by on our domestic deposits.

In order to win any war four things are required: an adequate number of men; adequate plant and animal fibers to clothe them; adequate food to feed them; and adequate weapons, munitions, planes, tanks, and battleships with which to fight. These latter, mind you, are all of mineral raw materials. Without an abundance of these last three - food, clothing, and fighting facilities - no army can endure. It is said with apparent accuracy that food, or the lack of it, defeated Germany in the World War. It may be said with equal accuracy that Germany could not have entered any prolonged war until 1914, because until then she did not have her nitrate industry in condition to supply her munitions.

Let us see what Germany's position is as regards to supplying herself with the most needed essentials in carrying on a war:

Non-Mineral Materials.

Food supply: Germany has 60 million acres of arable land - almost exactly the area of the state of Oregon - but she has 80 million people to feed. Normally forty percent of her population is required to feed and clothe the nation. In the last two years, however, so many men have been drafted into the army and into industries for the production of munitions and armament that, we believe, the production of foodstuffs has been considerably diminished. In the World War, Germany started the use of food cards and rationing during the latter period; in this war Germany is starting the use of food cards in the beginning. To the visitor in Germany last winter, I understand, nothing was so obvious as the lowering of the quality of food and the shrinking of its quantity.

Germany is lacking principally in fats. Two-thirds of Germany's meat diet is pork. Through her Garbage Plan of two years ago she raised 200,000 extra pigs, but three or four million of the regular production had to be slaughtered for lack of imported fodder and oil cake. A quarter of her eggs and cheese comes from Holland and Denmark. If the war goes far enough, I venture the prophecy that she may go so far as to invade Denmark in order to augment her supply of dairy products. Germany is taking the entire output of the Norwegian whaling industry, and uses whale oil in her butter and table fats. In recent years Germany has taken between five and ten percent of its land out of production for military uses, parade grounds, landing fields, etc. Germany's greatest lack for any sustained war is food.

Clothing supply: Germany is producing at home about one-third of her annual consumption of fibers for the manufacture of clothing. Of this, about one-half is in the form of rayon and "vistra", which are made from wood fiber. One of her principal reasons for wanting Poland was to supplement her supply of wood products. Austria has helped on the wood supply but even so, most of Germany's wood products

come from Russia and Finland, with some from Czecho-slovakia. We in this country have no conception of what forest conservation means. Cutting down a tree in Germany is a serious matter.

Rubber: German synthetic rubber, called"buna", is made by the German Dye Trust. It is superior to natural rubber for auto tires, costs between fifty cents and sixty-five cents per pound, as near as we can tell. In 1936 Germany produced about one-fourteenth of her consumption of about 75,000 tons of rubber. Since then, it is thought she has increased her production of home-made rubber to around 24,000 tons, but at a tremendous cost for plant construction. At that she can produce only from one-fourth to one-third of her war requirements. Mallon says she imported 180,000 tons last year.

Mineral Raw Materials.

Iron: Germany today controls not much more than a fifth of the iron production that she did in 1914. That is due principally to the loss of Lorraine. The German Mining Journal estimates that she requires about 26½ million tons of iron in war time; she used more than 20 million tons last year - in preparation. Normally Germany imports nine million tons of high grade Swedish ore from Lapland and seven million tons of fair grade ore from Lorraine. Presumably both of these sources will be cut off. Ore running twenty-eight to thirty percent iron is the usual grade mined in Germany; in this country anything below fifty percent iron is not considered ore in the Lake Superior region, unless it contains manganese. They are now opening their Gitter deposits, running from twelve to seventeen percent iron and located several hundred miles from their blast furnaces. What tremendous quantities of fluxes will be required to smelt this ore!

Oil: It is estimated (Deutsche Wehr) that about 5½ million tons of gasoline, oil, and greases are required each year to serve a modern army of three hundred divisions, which would include thirty motorized divisions with 10,000 tanks, 140,000 trucks, 40,000 passenger cars, and 60,000 motorcycles. An air force of 9,000 planes in four different classes would take another 1-3/4 million tons. Two million tons is calculated for navy use and 3½ million tons for industry and transport behind the lines. A total of 12-3/4 million tons would thus be required. She has a domestic production of around 3 million tons or about one-fourth of her war-time needs. Incidentally she is producing about 1½ tons of gasoline and oil from coal. To make Germany self-sufficient in oil by using her coal would require a plant investment of around 15 billion marks or about a quarter of her national income, and require a half million men; so that is out of the question.

Aluminum: Germany has about one-twentieth of her ordinary consumption of aluminum. She has been producing aluminum from clay but at excessive cost. In war time Germany needs large quantities for airplane manufacture.

Magnesite: Germany was deficient in magnesite until she acquired Austria, which has plenty.

Nickel: Of nickel Germany has none. She might get a little from Greece if there were a connection.

Copper: She produces about one-tenth of her needs in peace times. She has been turning to aluminum, which supply now is mainly cut off. She is reported to be making airplane fuselages out of plastic on account of lack of metal.

Lead: She produces around one-fourth of her peace-time needs of lead.

Zinc: Of zinc, she produces about two-thirds of her needs.

Tin and Manganese: She has no tin or manganese except stores.

Nitrates: Of nitrate, Germany has adequate production for munitions purposes.

Thus it appears that the success of Germany will depend on her ability to maintain imports of iron from Lapland and oil from Rumania. In the last few days we have noted that the French have struck heavily with air forces at the industrial centers in the Saar, which contain coal. The Rhineland, including Essen and other steel towns, is mainly within 70 miles of the French border. Normally one-third of the Swedish ore comes down the Baltic route and two-thirds from the coast of Norway by boat to the mouth of the Rhine, which is on the coast of the Netherlands. It would be very difficult for Germany to keep this route open now. Since the Rumanian oil interests are mainly English or neutrally controlled, it appears that Germany will have plenty of trouble keeping a stream of oil coming in to run her planes and tanks.

Russia probably will not sell much manganese and wood products to Germany because she needs them herself, and also because Germany has not money to pay. Paul Mallon reports that Russia still has blocks of marks piled up in German banks representing payments not made on her last trade agreement with Germany.

Before harvest comes next year, Germany will be a hungry country - hungry both for food and for several essential raw materials. Without full cooperation of Russia, Germany cannot go out and get the things she needs. England's navy will see to that.

Italy's entrance into the war on Germany's side would help some, but Italy might easily be a drag in the end. The "axis" countries could get iron ore more easily from Spain and Morocco, quicksilver from Spain, and nickel from Greece; but England and France doubtless would bottle up the Mediterranian at Gibraltar and Suez. Her own supplies of tin and rubber would have to come from around Africa, but it seems to me that the net effect would be only to delay the end. Italy is vulnerable by land and sea from France and knows it. She will probably be wise and stay out.

I anticipate that there will be internal dissension in Germany within the next few months; that this will be caused or heightened by lack of morale both in the army and among civilians because of the food restrictions. It seems to me that Germany cannot possibly hold out a year and a half if France and England continue pressing their offense. England, with the help of the dominions, will probably muddle through.

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ICE AGES ARE CAUSED BY THE SUN GETTING HOTTER.

Ice ages are caused by the sun getting hotter.

This paradoxical theory is advanced by Sir George Simpson, eminent British meteorologist, in the annual report of the Smithsonian Institution recently issued to account for the extraordinarily complex pattern of the great glaciations which covered large areas of the globe during the Pleistocene geological period just preceding the present.

Briefly, one effect of more heat from the sun is to cause more evaporation of water from the seas, which causes increased cloudiness over the globe. This in turn results in more precipitation - rain or snow. Up to a certain critical point the precipitation in the polar regions will be in the form of snow. This will pile up for milleniums on the Arctic and Antarctic land masses until glaciers thousands of feet thick are formed, which will start to flow northward and southward until they reach latitudes where the normal summer temperature is sufficient to melt them.

It is now generally accepted by astronomers that the sun is a variable star. Its radiation output which heats the earth undergoes periodic ebbs and surges. It might naturally be assumed that an ice age would result when the solar temperature sank so low that an excess of ice would be formed in the polar regions, and the summer temperature in temperate zones was insufficient to melt it as fast as it advanced.

But, Sir George Simpson points out in the Smithsonian report, the actual pattern is too complex for so simple an explanation.

First, such a phenomenon would necessitate a greater decline in solar heat than would fit into the fluctuation picture of astronomers.

Secondly, the whole earth would be affected. There would be a decrease in evaporation from the surfaces of all the oceans. This would probably mean over a long period a decrease in rain precipitation in the tropics. Actually there is accumulating geological and paleontological evidence that while the great ice sheets were flowing from the poles there was an enormous increase of rainfall in low temperate and tropic zones.

Thirdly, the ice advanced and retreated in a paradoxical way. During the Pleistocene in both North America and Europe there were four glaciations and three interglacial periods when the major portions of both continents were free of ice. Two of these interglacial eras were short, one long. It might be expected than an interglacial period, owing to an increase in heat on the part of the sun over an extended period, would be cold and desolate. Actually, the geological evidence now indicates, they were hot. The average temperatures of northern, Sir George Simpson points out, must have been higher than they are today because fossils dating from these periods are found in higher latitudes than are normal for the same creatures at present.

All this fits into the hotter sun theory of ice ages. If the increase of solar radiation was progressive, a point would eventually be reached where even the polar regions would be so warmed that the glacier-building progress would be arrested and the ice age would come to a rather abrupt end. And once the ice was cleared from the temperate zones, they would be relatively warm.

After the solar radiation had reached its maximum, the solar ebb would set in and the whole process would be gone through again in reverse. Eventually the critical temperature would be reached at which the ice would form again. This, however, would require a longer time for the building up of an ice age than would be required while the sun was getting hotter.

The period between these two interglacials would be short and hot. The heat of the sun would continue to decline. Hence, precipitation would decrease. There would be no further building up of ice, no further increments from the polar regions. Eventually the point would be reached in temperate zones where the balance between ice accumulation in winter and ice retreat in summer would be reversed.

The solar heat would reach its minimum and then start to go up again, eventually increasing the precipitation to the point of renewed glaciation. This would be a long, cold interglacial period.

It is difficult to unscramble the pattern of glaciations and interglaciations of the Pleistocene, but the present evidence supports a hypothetical picture in accord with the hotter sun theory. The four glaciations came in pairs. The first and second and the third and fourth were separated by brief warm periods. The second and third were separated by a long cold period.

The actual pattern of the glaciations was curious. In both Europe and North America it extended far south of the present ice belt - in England as far as the Thames and in eastern North America over New England. In eastern North America and in western Europe also it came considerably farther south than in western North America and eastern Europe. In other words, great arms of glaciation seemed to follow the Atlantic. Also, it is now known that the center of dispersion of the ice was not at the north pole but somewhere in the middle of Greenland. Furthermore, Sir George Simpson explains, it is difficult for meteorologists to admit that the climates at the southern fringes of the ice belt would ever have been cold enough to support such a building up of glaciers, unless geographical conditions were markedly different from those of the present.

The topography of the earth has not changed notably since the beginning of the Pleistocene. The major land masses and the oceans were in about the same position then as now. The north pole was in the middle of the Arctic Ocean. Consequently, there could have been no great building up of ice there, regardless of the precipitation. It would constantly have been broken up and floated southward into the Atlartic between Iceland and Norway.

This would have markedly changed the temperature of the Atlantic and wiped out the ameliorative effect of the ocean on the neighboring land masses. The effect of the Gulf stream would have been wiped out, for example. Meanwhile the great surges of ice would be coming out of Greenland across the frozen northern seas and flowing down over the land. Vegetation would disappear before them and the previously forested continents would take on the appearance of Greenland today.

There was no corresponding flow of ice into the Pacific Ocean because there was no place for it to get through. Consequently the Pacific shores of North America and Asia were not glaciated so far to the southward.

"If the theory is correct," says Sir George Simpson, "we now are living in a cold, dry epoch owing to the decrease of solar radiation from its last maximum. If the solar radiation again increases there will be another glacial epoch and our epoch will become a second cold, dry interglacial."

- Smithsonian Institution.

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THE GEOLOGICAL NEWS-LETTER

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ANNOUNCEMENTS

Lectures

S P E C I A L N O T I C E

The next two lectures - the ones on March 22 and April 12 - will be held in ROOM 303, Y.M C.A. BUILDING, 3 W.6th Ave. at Taylor Street, as our regular meeting place will not be available on those two dates. Please tell others of this change.

Friday Mar.22 — Subject: THE ROLE OF THE ASSAYER.
Speaker: Mr. Leslie L. Motz, Metallurgical Chemist, Oregon State Department of Geology & Mineral Industries.

Mr. Motz will tell us of the purposes, principles and practice of sampling mineral deposits. He will illustrate his talk with a motion picture of his own taking, entitled "The Assayer - Key Man of the Mining Industry", which shows the procedure of the State Assay Laboratory at Baker, Oregon. Geology as a pure science, by itself, is useless. It needs a "follow-up", such as that provided by the assayer, to render it of practical value to man. The geologist tells where to get it; the assayer tells what it is when it is obtained.

****

CHANGE OF ADDRESS.

Mr. & Mrs. John Eliot Allen	MU 6555	5726 NE. Cleveland St.
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A. Gael Simson	420 Post Office Bldg., Portland, Oreg.	

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March 6th Dr. Hodge spoke before American Society of Military Engineers. His subject was "The Role of Strategic Minerals and the Wars."

Mr. and Mrs. O. E. Stanley showed colored pictures and lectured on their trip to Mexico before the Audubon Society on the evening of March 7th. They also showed their pictures March 18th at a meeting of Idaho State Society.

Our President, J. C. Stevens, lectured Friday evening March 15th at the regular meeting of the Agate and Mineral Society. The title of his lecture, "The Saga of the Colorado".

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ANNULAR ECLIPSE OF THE SUN

Mid-day, Sunday, April 7, 1940.

by Carl Price Richards.

The constant revolution of the moon around the earth, in a plane inclined only 5 degrees 9 minutes to that of the plane of the earth's motion around the sun, makes it inevitable that occasionally the three bodies will be in line. When that occurs, either the moon hides the sun from the earth, or the earth hides the sun from the moon. The first case produces an eclipse of the sun, and the other, an eclipse of the moon.

In an eclipse of the sun, the actual orb of the sun is obscured from our view by the moon getting in between us and the sun. But in an eclipse of the moon, since the earth is between the other two bodies, it intercepts the light of the sun and prevents it reaching the moon. Or, in other words, the moon, which shines only by reflected sunlight, is within the shadow of the earth and hence, "goes out", or is "eclipsed".

There are various forms of both solar and lunar eclipses, but let us confine our attention at this time to the former, as it is one of that kind which occurs on April 7th next.

To understand what happens at the time of an eclipse it is necessary to appreciate the relative sizes and distances of the sun and the moon. So let us state the bare statistics first and then examine them to see what they imply.

Firstly, the sun is a spherical body, 864,400 miles in diameter and, since the earth's orbit is an ellipse and not a circle, the earth varies in distance from the sun from 91,342,000 to 94,452,000 miles.

Secondly, the moon is also a spherical body, but only 2160 miles in diameter, and, since its orbit around the earth is also an ellipse and not a circle, our satellite varies in distance from the earth from 221,460 to 252,710 miles.

Such are the basic facts which cause the differences in the nature of the various eclipses of the sun. Keeping in mind the elementary fact that the closer an object is to us, the larger it appears, (that is, it subtends a greater angle from our eyes), a little arithmetical exercise with the above figures shows that the apparent size of the moon when it is closest to us, is a little larger than the sun appears to be, even when it is nearest to us. And, conversely, it figures that, when the moon is at its greatest distance from us, its apparent size, or disc, is somewhat smaller than that of the sun, even when the sun is farthest away from us.

Stated in minutes and seconds of arc of subtended angle, the apparent diameters are as follows:

	Maximum (when nearest)	Minimum (when farthest)
Sun --	(A) 32'-32"	(B) 31'-28"
Moon -	(C) 33'-32"	(D) 29'-23"

Or, in percentages of the sun's diameter:-

If (A) is 100, (C) is 103.1 and (D) is 90.3
and if (B) is 100, (D) is 93.4 and (C) is 106.6.

Thus it is evident that, according to the distance the moon is away from the earth at the time of solar eclipse, its disc either (1) totally obscures the sun,

or (2) fails to cover entirely the full area of the sun. The first case is known as a total eclipse, and the second is termed an annular eclipse - from the latin word "annulus" meaning a ring, because a ring of the sun's surface is seen around the moon.

In both these types, the area on the surface of the earth from which the eclipse can be seen as total or annular, as the case may be, is exceedingly limited, being a circular spot, varying in size in each eclipse, but rarely more than one or two hundred miles in diameter. But this "spot", which is in reality the apex of the moon's truncated shadow cone, moves rapidly across the face of the earth, following a path which astronomers can predict with extreme exactitude. The speed at which this spot of shadow sweeps across our seas and continents is such that it passes a fixed point in a very few minutes; hence the duration of the total or annular phase of an eclipse is always brief. Under favorable circumstances it is 7 or 8 minutes.

Within a much larger, but still limited area outside this path, the eclipse, whether total or annular, is seen as a partial eclipse. That is, the moon is seen to hide only a part of the sun's area, and the sun appears the shape of a cookie which has had a bite taken out of it. This phase lasts 2 or 3 hours.

There are also many eclipses which can only be seen as partial, because the apex of the moon's shadow cone, or umbra, falls outside the disc of the earth's globe, but the penumbra, or partial shadow of the moon, from within which the sun is seen partially eclipsed, does sweep across a portion of the earth's surface.

Such, in general terms, are the elements of solar eclipses. Now let us see how they apply to the forthcoming eclipse in April.

On April 7th an annular eclipse of the sun will take place, and the path from which it will be seen as such sweeps across the Pacific Ocean from about longitude 175 E. of Greenwich and 5 degrees S. of the equator, crosses northern Mexico and the southern United States, ending in the Atlantic Ocean at longitude 80 W. of Greenwich and about latitude 30 degrees N. This path is about 150 miles wide and over 7,000 miles long, of which less than 2,000 miles is across land. The area from which it will be seen as a partial eclipse extends on each side of this path, north as far as Yukon, thus including Oregon, and south to Equador. The farther one is from this path, the less will be the area of the sun obscured by the moon.

One interesting thing about this eclipse is that it begins west of the 180th meridian, or international date line, and moves eastward across that line, proceeding as far as the Atlantic Ocean. Thus we have the anomaly of an event which starts the day after it ends!

For the Portland area, the data for this eclipse are as follows:-

Date: - - - - - Sunday, April 7, 1940
First contact:- 11:45 a.m. Local standard time
Maximum phase:- 1;06 p.m. " " "
Last contact: - 2.23 p.m. " " "
Percent of sun's diameter obscured:- 40%

Warning! Do not attempt to observe this eclipse with naked eyes or thru field glasses. A piece of glass, smoked in a candle flame, or a densely exposed photographic negative must be used in fron of one's eyes, otherwise blindness or serious injury may result.

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GEOMORPHOLOGY OF EUROPEAN BATTLEFIELDS.

Dr. Edwin T. Hodge, professor of Economic Geology at Oregon State College, spoke before the Geological Society of the Oregon Country Friday evening January 12th, on the subject, "Geomorphology of European Battlefields". Illustrating with blackboard drawings, he showed what an important part the topography plays in the affairs of European nations, with particular reference to the mineral resources. He first defined the word "geomorphology" as the science of the relief features of the mountains, rivers, lakes, valleys, continents and oceans, the science of the forces of the earth.

He said in part: "Geomorphology has played a basic and fundamental part in the history of the world, in determining the boundaries which nations assumed, when those boundaries were not established in a proper geomorphological manner. And since there have been wars, these wars were fought over these geomorphological boundaries. I want to talk to you a little while relative to the influence of the geomorphological features of the battlefields of Europe. There are so many wars going on that some of the wars we have almost completely forgotten, Japan for instance.

"To begin at the north end of Europe: There is one basic geological fact that has a bearing, both on the causes of the war, and the manner in which the war is fought, and that is, because northern Europe has been subject to glaciation. At one time ice covered all of northern Europe. The ice moved upon the British Isles, moved southward, and southeastward. The importance of that ice was not only a scraping of the soil and denuding the land in the north, but to deposit to the south the rocks and soil which it had carved from the north.

"Another fact is that the wind blew continuously in the same direction, southwest, south, and southeast. You must remember that when we have a large ice area, the area is chilled, and being heavy, tends to run downhill like water. The air came down from the glaciers, and more air, taking its place, became chilled. So there blew constantly from the ice sheet, chilled air, but only a certain distance before being warmed up and ceased to be a steady breeze.

"In addition to that, the ice was carving rocks from that area to the north, the great shield area of Europe, and was grinding it up so it became rock flour. And when the ice at the south end melted, the rock flour was freed and gradually dried out, was picked up by the wind and carried across the Danish peninsula and the great Baltic coastal plain, out to the distance to which that wind blew, and settled. We find the rock flour produced over this country a peculiar soil The ice moved south at various stages and carried the soil away and that finely ground rock flour, borne out by the wind, caused the black earth belt of Russia, making it the most fertile soil of all Eurasia. It extended down onto a portion of Rumania and all of Bessarabia. That accounts, on the one hand, why Russia wants to get back Bessarabia, which it lost to Rumania at the close of the first stage of the world war. We find the location of the city of Moscow at the northern end of that black earth belt. All the railroads of Russia radiate out from Moscow in all directions. So there we have, as I see it, one of the basic factors in this, the second stage of the world war.

"Let us again consider this portion of Eurasia, the Scandinavian peninsula, the gulf of Riga, the Gulf of Finland. The ice moved southward across this area, and that ice, moving south across that land was 10,000 feet thick, or even thicker. The great weight of ice cut, gouged, and simply scoured this country. The effect of that ice was to go up some river valleys which then flowed north. It moved

south, up those river valleys and gouged them open, making fiords. Elsewhere, all over this region, the ice scoured away all the soil, denuding the whole region which we will call Lapland. And the same might be said of all the tundra country Finland has a great north port, to which its railroads run to the Arctic, and there is Murmansk to which the railroads of Russia run to the north.

"As the result of that scouring of that surface, denuding that country of all soil, doing a stripping job on the rock itself, certain mineral deposits were exposed. In the Kola peninsula, in Russia, we have two One is the largest apatite, calcium phosphate, deposit in the world. The other is a large deposit of magnetite. There are also nickel deposits.

"Coming down from Cape North and the White Sea to the Gulf of Bothnia and the Gulf of Finland, the ice scoured that country, completely denuding it of all soil, since which time, nothing has grown on it, excepting a thin layer of sphagnum moss, tundra, and certain types of things that grow in that moss. Eastward, the ice did some scouring, but not a great deal. But the ice, moving down, moving back, and moving south again, interrupted two streams that flowed northward, and dumped a load of rocks, leaving a glacial moraine. The result of that glacial moraine was to form a dam, and the dam still exists there as Lake Onega, in the Karelian province, and another dam, forming Lake Ladoga.

"The important thing about this is, that same process took place throughout the whole belt. This whole region is covered by elongated lakes that belonged to a former drainage system All over that region are lakes elongated north and south, fingering, so that Finland has been called a land of a thousand lakes. But there are many more than that The important thing is that the lakes have a north and south length. Long, narrow, except where the river valleys are very shallow. Every Finnish farmer has at least one lake on his farm.

"From a military point of view, any army has a problem attempting to cross Finland from east to west, or from west to east. The Russians wisely chose this season to make the attack. An army at any other time would find lakes to cross and in between these lakes would be muskage swamp. Not everywhere. There are some high spots here and there, but elsewhere lakes or swamps. Water too deep to take an army across. So when spring comes in Finland, the Russian drive will have to be in the air. It cannot be on the land.

"Another feature which has military significance. The Scandinavian peninsula, this whole region, is a region of high mountains rounded off in the main, rising up from the coast to a plateau, more or less, a flat area, though not exactly flat. It is a region where glaciers have rounded the mountains off at elevations of 4,000 to 5,000 to probably 7,000 feet. A region which was once covered with ice. It moved down the river valleys and gouged them out, so that we have the famous fiords The glaciers moved down so as to make islands, and double fiords. All along this coast of Norway there are islands due to the rise of water over this whole region at the close of the ice age. They represent the tops of mountains during the ice age, which were connected with the main part of the land They are called Skerrygaard, and are identical with the islands along the entire coast of western Canada and Alaska. The islands are not similar in their origin with the islands of the west coast of America and are not as large. Those of the Norwegian peninsula have been formed by the coastal waters as the result of the ice age.

"There are now fiords where used to flow streams into the Gulf of Bothnia before the ice age. The ice moved down with the streams and formed glacial valleys, now fiords. The glaciers formed dams farther north on the peninsula, and on retiring, left lakes, such as Trask Torne, Gellivare, and just north of the Arctic Circle Kirunavaare". Dr. Hode pointed out on the black board drawing the high land of Scandinavia, the lower high land, and the coastal plain, and said there is just one place across the entire woodland, or highland of Sweden where the railroad can cross to Port Norveg.

"Along this one place, where the streams were of such character as to divert the ice so that almost a water level railroad crosses it, there was at the same time exposed by glaciers, one of the finest iron-ore deposits in the world. This ore is shipped to England and even to the United States, to Germany and France. Last year Germany took 40 million tons, all shipped by the Atlantic ocean. The narrow, wasplike midsection of Finland, across which the Russians have made their attempts to drive, for what purpose? Certainly, to get what Russia has always wanted, an open outlet to the Atlantic Ocean. Why? These two great iron ore deposits are worth it to any country. During the first stage of the world war, Sweden sold so much of that iron ore it became very wealthy. I think the Russian drive across this region is for the strategic reason of getting this portion for Russia, and find an outlet to ship to the world those great fertilizing minerals we call apatite, also to have an ice-free outlet for Leningrad.

"I also see in that drive the effort on the part of Russia, not only to obtain a port on the Atlantic, but also to obtain those great iron ore deposits. I see in that, joint effort between Russia and Germany, as they would be just as available to Germany as they are now, and if Russia or Germany does not own them and the Gulf of Bothnia is closed, then Germany would be shut off. So there is only one thing to do, for one country or the other to take possession of that.

"We might say something relative to the Maginot-Siegfried line. The rocks in Northern France are like a sheet of paper that has been bent up on one edge. They form a cliff that faces to the northeast across French soil, and not very far up on the borderland of Belgium. Southward, the sheetlike rock bends up again, to form a dome. North is a gigantic coastal plain, almost an enormous flat delta. A similar cliff almost joins the first one, forming a great porcelain saucerlike slope. The Meuse river rises in this area and flows out to join the Rhine. A third cliff, similar to the others, in this same locality, is adjacent to the Rhine river at the northeast corner of France. On the other side of the Rhine the country is all flat, the coastal plain of Denmark and Germany.

"These rocks that rise to the surface like a sheet of paper, brought to the surface many years ago certain iron ore deposits. Geologists, sinking shafts down into the ground, found many of these ores at Briey, in Lorraine, sometimes called the iron ore deposits of Lorraine There was a time when the Germans attemped to establish a boundary line, so decided to take only a certain portion from France that was valuable for another reason. They asked their geologists where these iron ores were, and the geologists drew a boundary line. But it became apparent that the ores dipped, and they found that these enormous deposits of iron were within the French border. That was where the Germans in the first section of the world war made their drive."

Dr. Hodge showed on the blackboard map the Rhine river and Alsace, which was given to the French, and in which is the Rhine valley. He pointed out a great mountainous highland called the Slate mountains, or Rhenish highlands. They rise

several thousand feet into the air, covering an immense area. At their northwest boundary is Holland and Belgium. To the south lies France, and to the north lies Germany, except Luxembourg.

"Now it is obvious that no army can cross the top of those mountains successfully and maintain itself with supplies. That would be a formidable task in a continuous area of such hills. They would have to go 2,000 or 3,000 feet high and down into the valleys traversed by the narrow gorge of the Moselle, by the canyon of the Rhine, and by the canyon of the Meuse.

"On the French side the young rocks of the Paris basin are like a pile of dishes or saucers;- a small dish on top, set into a larger dish beneath, this dish set into a still larger dish beneath it, and so on, until we get into the largest dish of all. The next dish is one sloping back, except where it is cut by the canyon of the Meuse. The dish, while still plastic, was warped. At another place, these rocks were warped and the top cut off, and a river cut through, so only a portion can be seen now. This other portion is in England. The English Channel is an eroded anticline, across which a river, now the English Channel, once flowed. The series of saucers formed in the early days the Hardt mountains, formed the cliffs which the German soldiers have had to scale. And along those cliffs, on both sides, the soldiers keep their watch on the Rhine.

"Now that the first stage of the world war is over, the French have built a series of forts along the boundary of France. Just as the Finns have not established their Mannerheim line upon the boundary, the French have built the Maginot line right on the edge of where these saucers come up to the surface. The geologists called these beds Oligocene. Just as the beds on the Dover coast are chalk, so these are chalk. It is a very easy thing for the French to dig down into the chalk and build forts. The Siegfried line, on the other hand, is located on the other side of the Rhine. From the Rhine valley and back to the Maginot line, is what might be called a No Man's Land. It is French, but undefended by French forts.

"On the south side of the Rhenish mountains are great deposits of coal, and they are in France, the Saar. There are great deposits of coal also along the entire edge of these mountains, but one of the finest is in a portion of the Rhenish upland, and that is the Ruhr. That is Germany's one fine coal deposit.

"During the first stage of this world war, the Germans had to scale the mountains first, and before they could reach Paris they would have a few more of them to storm. At this time, apparently there is little hope they can do it, with the magnificent fortifications which have been built there. One way is for the Germans to swing around to the west and cross the coastal plain, undefended except by such forts as Belgium may have, or as Holland may have. So any time either side decides to violate the neutrality of Belgium or Holland, the armies will be at the throat of the enemy within 48 hours. There is hesitation by Germany on account of violating neutrality, and because of the Maginot line. There was no Maginot line in the last war, and the battle of the Somme was fought. The temptation this time is on the part of the British and French. The Germans will likely not violate the neutrality of Holland and Belgium for, having done so, they would succeed only in reaching the Maginot line."

Dr. Hodge made another drawing showing the Rhenish highlands and the canyon of the Rhine, and the edge of the turned-up plain sloping westward, the Hardt mountains, also some mountains along the French border at the northeast corner, the Vosges. These are steep on the northeast, sloping southwest, and rise to an elevation of about 6,000 feet. Across the boundary in Germany, is another

mountain range, just about like the first, steep on the southwest face and gently sloping to the northeast. These are the mountains of the Black Forest. They also rise to about the same elevation. Between them flows the Rhine. What happened at one time was that the rocks folded and the arch collapsed, and the key of it dropped. To the south of this area is the city of Basel, and a pass reaching into the Paris basin is the 'wall of gold', the great wine region of France.

South of Basel, along the border between France and Switzerland, are the Juras. Dr. Hodge stated that these mountains have been folded, but the arch of the the series of folds is not broken The Juras descend to a high plateau, the plateau rising up into the Alpine peaks of Switzerland. In this area are again the saucerlike beds, just as in France. They face northeast. The Black Forest swings up across the Juras and takes in a part of the Alps. The Alps go without a break right down to the Mediterranean coast between France and Italy. Rivers during the ice age formed Lake Constance, Lake Neuchatel and others in this district. The French boundary goes right through Lake Geneva. The Maginot line follows to the Vosges mountains, and ends at the Swiss boundary. So the Germans are unable to attack on the Maginot line, even though they do violate Holland and Belgium. Italy would have to go to sea or climb the Alps to get into France.

"The Scheldt and the Rhine, with several great tributaries, all flow northwest, and they carry into the ocean to the north, vast quantities of silt and have built up barriers all along. The silt thrown back by the waves has formed barrier bars or islands called the Frisian islands. One is Helgoland, a great fortification. With that destructive power Britain has not dared attempt to battle because land defenses are more powerful than can ever be carried on a ship".

Dr. Hodge next discussed southeastern Europe and its oil resources as affecting this second phase of the world war. He sketched a rough outline map showing Italy and Greece, and extending to the Sea of Marmora which borders Turkey. The location of Vienna was shown, at a point where the Alps descend and the Carpathians begin, and where the Danube river long ago cut through the mountains. He stated that Brenner Pass, lowest pass in the Alps, is about 4,500 feet high, about the same elevation of McKenzie Pass in Oregon. In the gateway between those two gaps of mountains at Vienna the Turks were once stopped in an attempt to push through to the Baltic. In Bulgaria, the Balkan range of mountains is split into two parts, with the Mauritza river flowing between. Warriors from the north, and warriors from the south, since time immemorial, have found this passage between the two mountain ranges the way to go. For any army moving southeast or northwest, this is the open passage. These mountains are the result of rocks being crumpled and folded.

"In the Hardt mountains in southwestern Germany the rocks have been crumpled and folded, badly crushed and changed. Out in the edges we sometimes get foothill ranges. Gentle folds against violent folds in the center. In the Rhenish highlands, by very diligent search and clever geological work they have found oil in regions where, in similar regions in Oregon, we would never have bothered to try to find it. Out of those few folds they have produced 5 million barrels of oil a year. By chemical means they produced 14 million barrels, a total of 19 million barrels. In times of peace the German people use 40 million barrels, so the 21 million barrels they must import in times of peace have come from North and South America.

"When the Germans took over Czechoslovakia, where there is an old land mass, with a few little holes, they were able to get out of Czechoslovakia one million barrels to help reduce their deficiency of 21 million barrels. The Poles produced 4 million barrels of oil in time of peace, before their destruction, with a normal consumption of 20 million barrels. Most of their importation came by way of the Baltics. Lwow (Lemberg), in an industrial triangle which the Germans tried carefully to save, would be of no use to the Germans if those industries cannot run.

"Rumania has some excellent oil wells which produce around 55 million barrels, of which she uses 20, leaving a surplus of 35, all produced not far from Bessarabia. That would seem to be a very ideal thing for the Germans. This oil at the present time is sold to Italy, Greece, Yugoslavia, and formerly to Poland and Czechoslovakia, those countries being entirely dependent on the Rumanian fields. Italy uses 40 million barrels. Iraq and Iran get oil on both sides of the Tigris river. If Italy goes to war and the Gibraltar is closed she would have to get her oil from Iraq, Iran and Rumania. If Germany takes all of this oil, Italy and these other countries must do without. If they use it, Germany has to do without. Suppose Germany does take it all. To supply Germany's war-time needs of imported oil, 11,000 tank cars would be required to transport it from Rumania to Germany. This is impossible.

"In the eastern part of the Caucasus mountains, which are in the extreme southern end of Russia, are oil fields. These are splendid fields, there are none better in the world. Russia says she produces 250 million barrels. But she must have been storing oil these last few years, or else she doesn't produce as much, or has none to spare. It is easier to import oil into the northern part of Russia for use there because of difficulties of the Russian railroad lines. Just so much can go through a pipeline. The oil from the Caucasus is carried by lines 380 miles to two ports on the Black Sea, and by tank boats 560 miles across to Odessa, then by a single railroad from Odessa to Lemberg, to Germany, 1,200 miles, to supply oil to Germany from Russia. It would be apparently physically impossible. If Germany took all of Rumania's oil, at best they could get only about 35 million barrels, which would be just about enough to take care of their peacetime needs.

"Now the geologist begins to wonder about some of these things. Of course he has been convinced that all of this propaganda, which he may or may not believe, has a petroleum factor. The present war is apparently a war being fought with high-grade petroleum and high-grade lubricants, and if Germany has vast quantities stored, it is at best not more than a year's supply. It is absolutely physically impossible, owing to the topography, to bring enough oil to supply her needs, even if Germany would own Russian or Rumanian oil fields.

"Something strange is going on in Germany. In light of that knowledge which we know they have, what have they in mind? Certainly they are not going to take a suicidal attitude in light of that information. So we geologists are expecting an unexpected thing to happen. We know that Germany recognizes these things, and knowing these things, nevertheless is going to do something, but what would it be? It is apparently beyond the ken of anyone outside Germany to know what she has in mind."

- E. M. Barr

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 7 PORTLAND, OREGON April 10, 1940

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The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

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Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

Lectures

SPECIAL NOTICE

Our next lecture, April 12, will be held in Room 303 Y.M C.A. Building, Sixth and Taylor. Our regular meeting place in Public Service Building will not be available on that date. Please tell others of this change.

Thursday April 11 — Members of the Society and their friends who are downtown Thursday noon, come to the L'Abbe Restaurant, Roosevelt Hotel, and join the group at lunch. Good eats, good fellowship, and always something of interest.

Friday April 12 — Subject: QUICKSILVER - VOLATILE IN NATURE, VOLATILE IN ECONOMICS.
Speaker: Mr. S. H. Williston, Vice-president in charge of operations, Horse Heaven Mines, Jefferson County, Oregon.
The production of mercury involves the solving of many diverse problems and Mr. Williston will draw from his extensive experience in describing to us such problems as those related to the erratic nature of the occurence of quicksilver in the various ore deposits; others involved in making good recoveries in furnace operations; and still others connected with the prevailing economic instability as it affects the industry. Oregon's role as a producer of quicksilver will also be discussed. The subject of mercury is a topical one at this time and we are privileged to have it presented to us by one who speaks with authority.

Thursday April 18 — Noon lunch - L'Abbe Restaurant, Roosevelt Hotel.

Thursday April 25. — Noon lunch - L'Abbe Restaurant, Roosevelt Hotel.

Friday April 26 — Place of Meeting - Public Service Building Auditorium.
Subject: OREGON IN COLORED MOVING PICTURES.
Speaker: Mr. James L. Loder, Salem, Oregon.
When an automobile dealer travels the state on business and on vacation, taking with him a motion picture camera, a supply of color film, and is a genius for getting the most out of them, the results are likely to be good; but, when one adds to this a "perceiving eye" on the part of the camera man, not merely for the beautiful, but for the geologically significant as well, the outcome is of surpassing merit. Such is the standard of Mr. Loder's films, and, moreover, he combines with the showing of them a running comment which is both instructive and entertaining.

FIELD TRIPS

Sunday April 14 — The "Doodle Bug" trip. Come out and take a gambler's chance on a good time. Where we go, what we see, and where we end, will depend on the action of the doodle bug. The caravan will leave SW Front Ave. and SW Yamhill Street at 9:00 a.m. Dress according to the weather.

Field Trips (continued)

The Trip Committee hopes to have a list of trips in the next issue of the News Letter. Suggestions for trips will be gratefully received by any member of the committee.

Members of the trip committee are requested to meet with the chairman after the next meeting, at the rear of the auditorium, to arrange for a regular meeting.

Wedding Bells.

Wedding bells rang out last Thursday noon April 4th. Mr. Franklin L. Davis and Miss Geraldine Keller White were united in marriage. The Geological Society of the Oregon Country extends best wishes to Mr. and Mrs. Davis and is happy to welcome Mrs. Davis into our membership.

******

The spring term of Dr. Hodge's class in Geology has commenced at Lincoln High School; meeting time Thursday evening 7 to 9 o'clock. The subject this semester is "Geology of Oregon", a very interesting topic to our members, and those planning to take this course should register at once.

It seemed like old times again to many of the Thursday noon luncheon group to greet Claire Holdredge who is back from Colombia, and we are looking forward with keen expectation to that lecture he has promised us soon.

******

Mr. O. E. Stanley showed his Kodachromes of Mexico in the club rooms of the Oregon Camera Club, March 27th at 7:45 p.m.

Mr. A. H. Hancock on March 28th lectured before a group of Nature-study teachers of the Portland public schools; the subject of his talk being the "Story of Fossils".

******

New Members

Mr. & Mrs. K. P. Mahony	BR 0957	1915 SW Park Ave.
Arnold Lubach		Forest Grove, Ore.

Change of Address

Mr. & Mrs. Claire P. Holdredge 1312 Public Service Bldg.,Portland

******

DUES ARE NOW PAYABLE!

MAKE CHECKS PAYABLE TO GEOLOGICAL SOCIETY OF THE OREGON COUNTRY, and mail them to Miss Rose Jennings, 609 SW Lincoln Street, Portland.

That the Geological Society of the Oregon Country has no lack of talent was again demonstrated at the fifth annual banquet, held Friday evening March 8, 1940, at Reed College Commons. The entertainment features consisted of stunts by persons within the membership, as is the custom on this occasion, and community singing. The guest speaker was Dr. George F. Beck, Professor of Geology at Central Washington College of Education, Ellensburg. Dr. Edwin T. Hodge also spoke briefly.

Dr. Courtland L. Booth headed the committee on arrangements, and Dr. Adolph Weinzirl was toastmaster. The tables were decorated with unique centerpieces, the handicraft of Mrs. Chester A Wheeler and her daughter, Miss Frances. On the mantel were clay models of Mesozoic reptilian monsters, the work of Mrs. L. E. Kurtichanoff. Mr. Thomas A. Carney was author of the clever decorations on the menu-program sheets. At each place was a piece of fossil wood, the gift of Mr. A. W. Hancock. The speaker's table had a large centerpiece of spring flowers, and each place was marked with a piece of polished wood.

Dr. Beck was presented with a pen and holder, having a fossil wood base, and Mr. Arthur M Piper, retiring president, was given a newly published book, "Geology and Engineering", by Robert F. Legget. Presentations were made by Mr. H. B. Schminky, retiring vice-president. Both outgoing and incoming officers were introduced, with the exception of Dr. J. C. Stevens, new president, who was unable to be present. In relinquishing his office, Mr. Piper turned over to the new vice-president, Mr. A. W. Hancock, Dr. Condon's book. "Two Islands", owned by the Society, as a symbol to be kept alive and passed along, as from one administrative group to another. Greeting were read from Mr. and Mrs. Ray C. Treasher, now living in Grants Pass.

Outstanding on the program of stunts was Mr. Hancock, in Mennonite garb, including hat and beard. He delivered a sermon, during which he called to account various members. His text was "They played on a harp with a thousand strings, spirits of just men made perfect". All of the stunts included humorous references to or imitations of "doings" or mannerisms of different members, especially on field trips. Dr. W. Claude Adams did a "Charlie McCarthy" act, using two dummies. Another feature was a group of marionettes with a series of acts pertaining particularly to field trips, and illustrating lines read by Mrs. Schminky, Mrs. Kenneth Phillips, and Mrs. R. R. Poppleton. "The Cherubs", including Misses Ellen James, Lotus Simon, Berrie and Audry Horton, and Frances Wheeler, in costume, entertained with impersonations, very well done. Dr. Arthur C. Jones led the community singing, and Mrs. Hancock accompanied.

Dr. Beck spoke informally on the subject, "Fossil Woods". He said it is literally impossible for the ordinary collector to tell in the field the name of a piece of fossil wood. If one has studied the subject a great deal he may recognize such woods as the elm or the oak. It is necessary to make a microscopic study, sometimes using a power as high as 1,000, to work out the cell structure before identification can be made. He suggested that it is best not to take a complete collection and try to identify all the material in it, but keep in mind certain woods. First, we should scan the material in the field as best we can, then use a magnifier up to 50 power and study it two or three times, then thin sections must be made. We should look for certain trees, keep them in mind when in the field.

"It was a great thrill to the people of the west generally, and in Oregon and Washington especially, to realize that redwoods at one time lived, scattered, over

the whole United States. The fact is accepted that they grew over the whole northern hemisphere. During the ice age trees here and there were not killed off, so the redwood in reality does not belong only to California.

"In 1900 it was a thrill to realize the gingko was scattered all over the country. All the old textbooks speak of the gingko as the outstanding fossil of all time. Of all the higher forms, it has been here the longest. The leaf is so characteristic. They began to find gingko leaves every place. One was reported found at Spokane." After two years search, Dr. Beck found one at Grand Coulee but as soon as it was exposed, the leaf was blown away by the wind. About eight years ago Dr. Beck and students searched hills and coulees for gingko, feeling sure they would recognize the tree. The first tree which rewarded their search was found in pillow basalt. It was not in sections, and in following it back into the lava, it was found to have branches intact. Fearing it would break up if efforts were made to remove the tree, it was decided to leave it in place. Later the Gingko State Park was formed to preserve this and some other gingko trees, due to the efforts of Dr. Beck.

Dr. Beck spoke of the cedars of Lebanon, found in the mountains of Lebanon in Palestine, the sacred tree of western Asia, as the gingko is a sacred tree of the Chinese and Japanese. He said, "Any tree that appears scattering, such as these, you will find in fossil form. About three years ago we started to look for cedars of Lebanon. Passing along the Columbia River Highway about three years ago, we saw a tree at McCord creek, near the bridge. There was a sign on the petrified tree there, "Western Hemlock", wrongly named. Nearby I saw a piece of fossil wood protruding from the bank, which proved to be cedar of Lebanon. We looked very carefully through the gingko forest for this tree, but found none, and decided it belonged to an older era, and may be in an older fossil forest". A small specimen of this tree was shown by Dr. Beck.

Referring to the recently discovered petrified forest in the Sweet Home area, he said it is very rare to have a forest with more than one or two kinds of woods. In the Sweet Home district are dozens of kinds, hardwoods. Forests usually preserved, generally run to conifers. He thinks steps should be taken to preserve this forest.

Up to a few years ago, the amateur collector was not recognized by scientists, according to Dr. Beck, but he has been found to be reliable. It is conceded now that he has a place, and should be encouraged. Specimens displayed by the speaker included a piece of wood with iron replacement, an unusual occurrence. Silica is usually the medium. He also showed a petrified cone, palm wood from Death Valley, and petrified ant eggs, and prophesied that some day someone will find a petrified hollow log with a petrified animal curled up in it.

Dr. Hodge, first president of the society, had for his topic "Five Years in Retrospect". He spoke as follows:

"Five years have passed since first our common interest brought us together. They have been happy years and interesting ones. We have learned to understand our Oregon country. We see national interest fixing its absorbed attention upon our land and trying, like us, to understand its possibilities. We have seen other lands swept by drying winds, whose protective, erosive sod cover had been destroyed and its ground waters exhausted and ruined, perhaps, for a generation or so. As

geologists, we want to prevent, through similar ignorance, the same affects here. We have seen devastating floods ruin or greatly damage great cities located unwisely upon flood plains. We note with satisfaction the building of flood control dams and other improvements upon our northwestern rivers. Some of our members have had a prominent part in this program. Our ground waters are being studied, as, by our past president.

"We have noted with concern the exhaustion of our untreasured and exhaustible mineral resources and their barter for a useless metal. We note, across the Pacific, a country imperiled by lack of mineral resources, making a desperate gamble to secure those of other countries round about. To the east we see Russia, with its 5,000 geologists, making that country the only threat to our comfortable mode of living.

"We see an empire that was founded upon the minerals coal and iron, and a coal-run, iron-made steam engine in 1774, an empire grown without obstruction for 160 years. Then we see a method to smelt the phosphoritic iron ores of Lorraine, give another country the advantage. We, as geologists, understand how the exhaustion of British coal, and the more and more unbearable competition, lead to the great war of 1914. The war for the possession of the world's mineral resources is a three party war: Russia, Germany and the British. Another party, possessed with more than one quarter of the world's mineral resources is bound to run headlong into collision with the powerful victor.

"We see the Northwest with potentially great mineral resources as perhaps the last frontier of our industrial development. All these things we, as geologists, can understand and appreciate.

"But, in addition to knowing the causes behind world affairs, we have also been enjoying our own part of the world. The satisfaction, emotional, almost religious feeling that an individual gets from understanding his own environment. Not ours to wander in a state of amnesia in our world. We live, we see, we feel, we know the running waters, the black storms overhead, the towering mountains, and the restless sea. We are one with nature, not only because we love nature, but because we try to understand her as well".

- E. M. Barr

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The Portland District, Oregon Music Teachers Association, will hold a business meeting at the Mallory Hotel April 10th at 11 a.m., followed by luncheon at 12. Mrs. Edward A. Boyrie will be guest speaker.

A WARM SPRING DOME IN THE SNAKE RIVER CANYON

Just above the mouth of Soda Creek, where it enters the Snake River Canyon about 20 miles down the river below Huntington, an interesting warm spring deposit forms a dome on the west side of the river. The location of the deposit is on the "Soda Creek Ranch", owned by Mrs. Hortense Pinus, located in the N½ of section 19, Township 11 S., Range 46 E., Baker county.

The dome, which is presumably composed throughout of calcareous tufa or lime deposited from the spring waters, has a maximum diameter at its base of about 200 feet, and a height of about 50 feet. The top of the dome lies approximately 150 feet above the low water level of the river. When visited in December 1939 the spring issued from crevices in the summit of the dome at an estimated rate of 1 or 2 gallons per minute, and had a temperature of 75 or 80 degrees. Considerable gas accompanied the flow.

The dome is situated at the south edge of a band of limestone where it crosses the Snake River, the rock adjacent to the deposit being a much altered greenstone. It is probable that the water-channel developed along a fault at this point.

A partial analysis of the water shows that it contains 1720 solid parts per million; the material assayed as being 49.7% CaO, 5.9% Mgo, and 2.2% SiO_2. Calculating CaO as $CaCO_3$ or lime, gives 39% CO_2, which totals 96.8%, leaving only 3.2% unaccounted for, which is probably CO_2 in combination as $MgCO_3$.

John Eliot Allen, Geologist.
Hugh K. Lancaster, Analyst.
Department of Geology and Mineral Industries

NEW GEOLOGIC MAP ANNOUNCED

Announcement is made of the publication of the following geologic map and text by the Department of Geology and Mineral Industries:

"Geology and Geologic map of the Round Mountain Quadrangle, Oregon", by W. D. Wilkinson and others; State Department of Geology & Mineral Industries, Map Series no.2, black and white geologic map, 30 minute quadrangle, scale 1:95,000; text, column, bibliography on back. Price 25 cents postpaid.

****

An interesting letter from Mr. Ray Treasher at Grants Pass was received recently, from which the following is taken:

"There are lots of interesting things down here, that probably wouldn't interest the GSOC, but they are quite pertinent. For instance, placer operations - that is, ground sluicing and handwork (sniping) is in full swing, although many operations are beginning to be handicapped by a lack of water. In spite of all the rain, the precipitation was liquid instead of solid, and run-off was immediate. Placer operations will shut down before long, or I should say that many of them will shut down. It's rather thrilling to see these hydraulic giants throwing a stream of water that would make a fire hose look like a small garden hose. These streams of water will throw boulders around like small grains of sand, and when that water hits, something has to give. I talked with a man today, a sniper, who picked up a nugget valued at $125.00 - just like that - why don't these things happen to me?"

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_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

All lectures held in Auditorium, Public Service Building, Sixth & Taylor.

DATES TO NOTE

Thursday April 25 — Members of the Society and their friends who are downtown Thursday noon, come to the L'Abbe Restaurant, Roosevelt Hotel, and join the group at lunch. Good eats, good fellowship, and always something of interest.

Friday April 26 — Lecture by Mr. James L. Loder, Salem, Oregon.
Subject: OREGON IN COLORED MOVING PICTURES.
When an automobile dealer travels the state on business and on vacation, taking with him a motion picture camera, a supply of colored film, and is a genius for getting the most out of them. the results are likely to be good; but. when one adds to this a "perceiving eye" on the part of the camera man, not merely for the beautiful, but for the geologically significant as well, the outcome is of surpassing merit. Such is the standard of Mr. Loder's films, and, moreover, he combines with the showing of them a running comment which is both instructive and entertaining.

Thursday May 2 — Noon luncheon - L'Abbe Restaurant.

Sunday May 5 — Field Trip. Larch Mountain. This repeats the trip of last fall when fog spoiled the views. We hope for better treatment by the weather this time. Leo Simon will lead the trip. Many wild flowers will be in bloom to add interest to this trip.

Thursday May 9 — Noon luncheon - L'Abbe Restaurant.

Friday May 10 — Speaker: Mr.Claire P. Holdredge, Consulting Geologist, Portland, Oregon.
Subject: GEOLOGICAL WANDERINGS IN COLOMBIA.
Most of the members of this Society know that Mr. Holdredge recently returned from a two-year sojourn in South America and have been anticipating the occasion when they might hear the story of his experiences there. So here it is - note the date and reserve it! He will tell us of the geography and culture of Colombia, as well as the geology of that region and the nature of his work there. In addition, he will show two reels of movies, most of which are in color.

Friday May 24 — Speaker: Dr.O.F.Stafford,Professor of Chemistry,Univ. of Oregon,Eugene,Ore.
Subject: THE CHEMICAL STORY OF ALUMINUM.
With the coming of the aluminum industry on a large scale to our locality, the story of the nature, sources and production of this ever increasingly used metal becomes one of transcending interest Dr. Stafford will present this story without using chemical terms, so that those who are not familiar with such will gain intimate inside information on what lies behind this industry and the problems involved in the production of the metal.

****

Are your dues paid? If not and you still wish to keep membership in the Society, will you please communicate with Business Manager - we do not wish to drop any one from roll who is really interested in the Society.

The following committees have been appointed for 1940:

Program:	K. N. Phillips, Chairman Carl P. Richards Dr. Francis T. Jones Louis E. Oberson F. W. Libbey
Field Trips:	J. Bruce Schminky, Chairman Lloyd Ruff Clara Nelson Mella C. White L. Martin Weber
Membership:	Leo F. Simon, Chairman M. H. Calef Jane Hurst
Historian:	Mrs. Elizabeth Barr
Museum:	J. C. Stevens
News-Letter:	Raymond L. Baldwin, Chairman Edwin T. Hodge Arthur M. Piper Ray C. Treasher A. D. Vance K. N. Phillips O. E. Stanley
Public Relations:	Clarence Phillips
Service:	Tracy Wade
Publicity:	Emma Nordgren
Exhibits	Tom Carney
Library:	Raymond L. Baldwin, Chairman Arthur M. Piper Mr. and Mrs. Carl P. Richards
Auditing:	Constance Endres Tracy Wade
Social:	Mrs . Arthur Jones, Chairman Mrs. J. C. Stevens Mrs. L. E. Kurtichanof Mrs. Ray Mackenzie Miss Helen Iverson Miss Florence Iverson Miss Constance Endres Miss Grace Poppleton

GOLD IN OREGON

by
F. W. Libbey
Mining Engineer, State Department of Geology & Mineral Industries.

Introductory

When it was that man first placed a value on gold, nobody knows. It goes back beyond the time of recorded history. The Bible first mentions gold in Genesis 13. After Abram's sojourn in Egypt and upon his return to the land of Canaan, the passage says simply that "Abram was very rich in cattle, silver, and gold." Other metals are mentioned much earlier chronologically. In Genesis 5, Tubal-Cain, of the seventh generation from Adam was said to be "an instructor of every artificer in brass and iron". This is the first mention of metals in biblical history - and it seems noteworthy that the first metallic mentioned is an alloy and not a single metal.

Getting back to gold - it seems reasonable to believe that man first became attracted to or by gold only after he emerged from that state in which all of his attention was directed at, first, providing himself with food, and, second, avoiding contact with or defending himself against his natural enemies. When man reached the stage in which he acquired a glimmer of the contemplative faculty, certain natural things attracted his attention, and among them was metallic gold. It had a peculiar fascination because of its unchanging color, its weight, and its malleability. This fascination and pride of possession led to its use as personal ornaments, and the goldsmith's art began. Because of its rarity and desirability, those in power seized and accumulated it. Ceremonial and ornamental objects were made which became the badge of aristocracy. Inevitably this led to gold as a standard of value and a medium of exchange.

As the world's so-called civilization advanced, the power of gold increased until it became the greatest material force in existence. Practically all of the major activities of individuals as well as nations are concerned either directly or indirectly with the power that this metal represents.

I haven't seen it mentioned, but I should call gold the most important of war minerals, even though it is useless for the fabrication of war supplies, if we except a rather limited use as gold braid and insignia.

This brings up an interesting comparison; Germany produces and possesses an insignificant amount of the world's gold. In 1937, the last year for which records are available, Germany produced 8,028 ounces. On March 31, 1939, her gold reserve was reported as about 29 million dollars. Compare this with a nation whose dependencies produce most of the world's gold. The one famous district called the Rand in the Union of South Africa produces over 1,000,000 ounces a month, and then there are other parts of British Africa, Canada, and Australia - all large producers. I will not draw any conclusions. The possibilities existing in the maldistribution of gold among nations are unpredictable, but it seems to me that a nation waging war without adequate gold and without foreign credit is fighting against heavy odds.

History

Getting back to what is supposed to be the subject of this talk - the early explorations of the Northwest were not concerned with mineral wealth. The voyages of Heceta, Gray, Cooke, Vancouver, and others were made for the several purposes of claiming new land for their countries, of finding the Northwest Passage, of profiting from the fur trade. The Lewis and Clark Expedition was for the purpose of exploring the country included in the Louisiana Purchase and of forestalling other claimants to the land west to the Pacific. The mountain men who first penetrated the western country were trappers and fur traders and gave little thought to the possibility of finding gold. Few of them reached the Oregon country because of its complete domination by the Hudson's Bay Company.

In trading their furs, Indians showed a decided preference for metallic objects, and accounts of the voyages of Heceta and Cook along the coast mention that certain of the natives possessed implements of iron and copper which indicated a former contact with white men. However, no mention is made of gold.

You know of the first missionaries, of the first settlements south of the Columbia at Champoeg in the 1830's, of the first emigrants in the early 1840's, who came in ever increasing numbers. They sought new homes and free land. There was no thought of finding gold.

It is of some interest to note here that in 1841 the eminent mineralogist, James D. Dana, came to the west coast with the expedition of Commodore Wilkes. They sailed up the Columbia and Dana made an overland trip to San Francisco by way of the Willamette and Sacramento valleys. The following year he published a book on mineralogy and in it he mentions that gold was found in the Sacramento Valley and that similar formations existed in southern Oregon.

In 1847 John Marshall left the Willamette Valley and with two companions went to California to build the mill at Sutter's Fort. The result was the discovery of the rich Sacramento Valley placers with all the profound economic changes this discovery brought about.

From Oregon as from all other localities there was a stampede to the new gold fields. It is stated that fully two-thirds of the people left for California, paralyzing for a time what business and industry there was in the newly settled region.

Soon after the first discovery, prospecting for gold became a new, major activity in the west, and, while changing in method and application somewhat, it has continued to the present and will continue on into the future.

In 1849, gold was found in the sands of the Rogue River, and in 1851 on a tributary of Jackson creek. This latter discovery was the start of the gold mining industry in Oregon. The town of Jacksonville was founded and the first mining district organized. Other discoveries were made on the Rogue and its tributaries. There is no record of production, but it must have increased rapidly in that decade.

Gold was reportedly found in eastern Oregon (on the headwaters of the John Day river) as early as 1845. Mrs. Laodicea McNary, a member of an emigrant train of that year, picked up a rock containing free gold and carried it with her to the Willamette Valley, and the search for the source of that gold gave rise to the "Blue Bucket" legend. However, it was not until 1861 that gold was really mined. This occurred in Griffin Gulch a few miles southeast of Baker City. Soon other discoveries were made, and eastern Oregon became the largest producer of the State. It has

continued as such ever since.

Statistics

Turning to the statistical side - there was no federal governmental agency for collecting information on mineral production until 1866. In that year a special commissioner, J. Ross Browne, was appointed. So up to 1866 there is no authentic record of Oregon's gold production. Browne makes an estimate of $20.000,000 for this period (that is, up to 1866), but it was only a guess and the real amount may have been greatly in excess of this. For the year 1866 Browne places Oregon's production at $2,000,000. At the same time he states that "well informed parties" estimate the product for 1866 as $8,000,000. Also "statistical tables supposed to be worthy of credit show a probable yield of that state of $20,000,000. In 1865 the generally accepted estimate for Oregon was $19,000,000, though that was probably above the actual product. There is good ground for believing that the result for this year (sic 1866) will be considerably above that of last year". These different estimates show the great uncertainty of production figures made during the 1850's and 1860's. Later the technique of collecting accurate statistics was developed and with the exception of a few years (1876 to 1882) production figures are fairly accurate. From 1882 to 1924 the U.S.G.S. had charge of this work. In the latter year the U. S. Bureau of Mines took over the work of the Mineral Resources branch, and in late years have published statistics in the Minerals Year Book.

Returning again to the discovery of gold at Sutter's Fort and its effect on Oregon, in less than two years in the neighborhood of $2,000,000 worth of gold came into Oregon from California. As the population was about 13,000, this meant an average of over $150 of new money per individual in the territory. (Carey gives the population in 1850 was 13,294, with 1049 residing north of the Columbia). This new wealth had a profound effect on the Territory, inducing boom conditions, and of course turning all thoughts toward gold mining and prospecting.

Digressing a bit to get a sidelight on general conditions at this time, let's have a quick look at total United States production of gold. (Figures from Mineral Industry, vol.1, 1892). For the 42 years (1792 to 1834) total gold production was $14,000.000. In 1847 production was not quite $900,000. In 1848 the figure jumped to $10,000,000 and in 1849 to $40,000,000 - both of which increases are due, of course, to California's production. Production reached a maximum of $65,000,000 in 1853. It then jumped from $900,000 to $65,000,000 in 6 years. The effect on the economy of the United States cannot be readily imagined. This new wealth provided the impetus for the great industrial expansion of the country. We are told, and like to believe, that this industrial growth was due to our organizing ability, initiative, and inventive genius. More truly it was due to the production of large amounts of gold which provided the capital necessary to produce and fabricate the wealth of other metals in the country.

Beaver Money

One thing more concerning Oregon gold history. The early settlers got along without a circulating medium for money. They were - had to be - self-contained, and barter was used where necessary. As the population increased, however, this lack was felt more and more, and, when the gold came pouring in from California, there was great difficulty for the want of a standard, so that it might be used as a more precise medium of exchange. Also holders of the metal suffered loss by abrasion, etc. The legislature, which convened early in 1849, determined to do something about this confused condition and passed an act to provide coinage. It

allowed $16.50 an ounce for gold of "virgin purity and fineness without alloy". The act also provided for the coinage of 5 and 10 pennyweight pieces. However, the mint did not operate because before any minting was done General Joseph Lane, who had been appointed territorial governor by President Polk, arrived and the period of provisional government came to an end.

However, the local needs of the community for coins were supplied in part by private enterprise. Coins of 5- and 10-dollar denominations were issued by the Oregon Exchange Company. On the obverse side these coins bore the figure of a beaver, above which were the letters K, M, T, A, W, R, C, S. and below was O.T.1849. The letters are said to be the initials of the names of the men who made up the company - Kilbourn, Magruder, Taylor, Abernethy, Wilson, Rector, Campbell and Smith. On the reverse side of the coins was Oregon Exchange Company - 130 grains native gold, 5 D for the 5-dollar pieces, and 10 pwts. 20 grains, 10 D on the ten-dollar pieces. These coins contained 8% more gold than 5- and 10-dollar pieces of U.S. money and quickly disappeared from circulation when the national money became more common in Oregon, obeying the rule (Gresham's) that inferior money always displaces superior money in circulation.

Dredging in Oregon

Prospecting for placer gold led to the discovery of lode mines. With the exhaustion of the rich placers, lode mining took the lead in quantity of production and continued to exceed placers until after the World War, when production from placers again became greater and has generally been greater than that of lode mines ever since. In 1938 placers produced $1,901,565 out of a total production of $2,860,515, or 66.5%. Of the placer production, dredges (both bucket line and dragline) produced $1.573,075 or about 55% of the total gold production and about 83% of the placer production.

Dredging began on a commercial scale in California in the early 1890's. Three dredges started in Oregon in 1904 - one in Jackson county, one in the John Day valley, and one near Granite in eastern Grant county. the last in charge of Albert Burch. From 1904 to 1934, with the exception of 2 or 3 years, from 1 to 4 dredges operated, principally in eastern Oregon on Powder River, Burnt River, and in the John Day Valley. In 1936 there was a notable jump when 5 bucket line and 4 dragline dredges reported production. In 1938 5 bucket line and 11 draglines had production.

The largest dredge operation is that of the Sumpter Valley Dredging Company, with a connected-bucket type dredge having a capacity of about 180,000 cubic yards a month. There are several others in that general area in Sumpter Valley and in the district near Granite. Porter Bros. have a new electric dredge on Bull Run southeast of Granite.

In the John Day Valley proper there are two large operations - the Western Dredging Company and the Ferris and Marchbank, the latter one of the largest dragline gold dredges in the world.

In southwest Oregon there are at present three dragline dredges operating, with prospects for at least two others and one connected-bucket type dredge.

Lode Mining

Of the lode mines, of course, Cornucopia is by far the largest. In 1938 it was the largest gold producer in the state and produced two-thirds of all the lode gold. Although it has a rather remarkable record, it is really in the development

stage. It seems quite probable that when present plans are carried out, Cornucopia will have a materially greater production and will add measurably to the wealth of the state.

Other important producing lode mines are the Independence-Cougar in the Granite District; the Benton in Josephine county, and the Ashland in Jackson county.

Placer Mining

Placers, as applied to gold occurrence, are deposits of alluvial or detrital material in which the gold occurs in workable amounts and from which it may be obtained by various methods of placer mining. There are several types of placers but those of present importance in Oregon are the gravels of stream channels, either ancient or present day.

Speaking generally, the sequence of events in placer mining from discovery on is usually as follows: first, the discovery of the richer concentrations of gold in or near present stream channels; these are worked by hand methods. After the portions rich enough to be mined by hand methods are worked out, then comes the prospecting of the higher benches representing what is left of old stream channels, and the investigation of the gravel plains usually farther away from the source of the gold. Working such deposits requires a large expenditure of capital so that the investigations must be extensive in order to prove that the capital expenditure is justified. Such expenditures are usually beyond the means of the individual, so companies are formed and the ground worked on a large scale. Where gradients and water supply are satisfactory, benches and some gravel plain accumulations may be worked by hydraulicking, that is, excavation of the gravel is by means of water through nozzles under pressure. The gravel is washed into a sluice containing riffles which catch the gold.

The deposit may be in a flat gravel plain in or adjacent to a present-day stream, and, if various other conditions are satisfactory, it may be suitable for a dredging operation.

Dredging, as applied to gold placers, may be defined as the operation of excavating gold-bearing gravel and recovery of the gold in a washing plant, usually floating on a natural or artificial pond.

A connected bucket type dredge is one in which excavating is done by steel buckets connected together to form an endless line running over an upper and lower tumbler of the strong, rigid digging ladder. The digging ladder is supported on a hull which also contains the washing plant.

A dragline dredge is composed of two separate units - a dragline and a washing plant usually floating. The dragline unit contains an engine, hoisting drums, wire ropes, steel boom, bucket and traction mechanism by means of which the dragline unit moves about on the bank to be excavated. By means of the hoist, the bucket is manipulated with wire ropes run over the boom. The bucket is dropped from the end of the boom, then pulled into the gravel, then hoisted and dumped into the hopper of the washing plant. Besides the hopper the washing plant contains an engine, a screen, sluices, a stacker, a pump or pumps, and may contain auxiliary apparatus for saving the gold, such as an amalgamator and jigs.

It would take too much time to discuss the special field for each of these general types of dredges or their respective advantages and disadvantages. I want to speak of the salient features of dredging as a method of mining.

Comparison Dredging and Lode Mining

You hear of dredges operating at a good profit on deposits that carry only 15 or 16 cents per cubic yard of material handled. How can they do it? A lode mine of comparable tonnage output would need to run four or five dollars a ton, or 40 or 50 times as much as the dredging operation in order to be profitable. What are the differences in the two operations? The answer is in the simplicity of the dredging operation as compared to lode mining. Suitable dredge ground is unconsolidated and contains the desired metal free from any gangue or impurity from which it must be freed. Obviously, too, the gold is of such a small size that an efficient partial concentration is effected by coarse screening. It is then essentially only a matter of excavating loose material with efficient machinery, screening it, and allowing the undersize to run through sluices containing riffles which, because of the high specific gravity of the metallic gold, retain the gold while allowing the gravel to travel along to waste. The dredge washing plant is really a concentrator the simplest form imaginable. Especially in the bucket line dredge, the digging, the screening, and the sluicing are really one continuous operation. It is only a matter of a couple of minutes between the time of picking up the bucketful of gravel and time of depositing this same gravel as washed material on the tailings pile with the gold it contained safely trapped in the sluice.

Compare this operation with the various steps necessary in a large lode mine all of which add to the operating costs. Practically all of the large gold mines of the world are underground mines. They must be opened up preparatory to mining, requiring probably a larger capital outlay for this item alone than the whole dredge equipment cost. Then the rock must be mined, which requires a certain amount of blasting; it must be transported to the surface and to a mill; it must be crushed to a sufficient fineness to free the gold or the mineral containing the gold; and then in the mill various steps must be taken and various machines used to effect the concentration of the gold. Even with the simplest of flow-sheets, this usually means several distinct, closely controlled, even if continuous, operations. In the matter of time consumed in breaking, loading, transporting, and milling a small unit of the ore, it is a matter of several hours as compared to the very brief time of dredging the gravel.

Cost Factors

By means of this comparison it is perhaps made plainer why dredges are able to operate at such low unit costs. Fifteen or twenty years ago in California large dredges operated over a long period with such costs as low as around 3¢ a cubic yard. They can't do it now because costs have risen, but large connected bucket type dredges may have operating costs now as low as 5 or 6 cents a cubic yard. Unit cost in both lode and placer mining is a loosely used term, unfortunately. Usually it does not mean total cost but only the cost of producing the metal at the operation - that is, operating cost, and includes wages, salaries, supplies, repairs, power. It may or may not include depreciation; almost always the figure as given does not include capital costs, taxes, insurance, so that as a matter of fact the cost as stated means very little insofar as figuring profit is concerned. The latter group of so-called indirect costs might and probably would double the cost as stated. As a matter of fact, the only intelligent way of stating a cost would be in dollars per ounce of gold produced instead of cents per yard of material handled. Such a figure would mean something provided all the costs were figured. I mention these matters because of the loose way the word cost is often used, and that it really is not comprehensive unless it is stated what items of expense are really included.

Dredging in Farmland

I want to speak now in conclusion on a subject which has concerned the Department for the past year and which some of you may have casually considered if you have seen a dredge operating in a fertile valley, such as the John Day. That subject is the tailings from dredge operations in farm areas.

A little geology: The drainage area of a stream may have gold-bearing veins. The surface of the drainage area is eroded and the eroded material washed down to lower reaches of the stream. Here, because of the high specific gravity of the gold, it is left behind in places where the current slackens. Thus gold may be concentrated in workable amounts in the alluvial plains of the stream. These plains accumulate soil and thus may become farm land. To recover this gold, a dredge excavates the land down to bedrock, washes the gold out of the gravel, and stacks the gravel in mounds at the rear of the dredge; and, in so doing, the top soil is washed away. Thus rock piles replace the original farm land.

At first thought this seems like careless waste and something to be condemned - something requiring regulations. But let's examine some of the facts connected with the matter. Basically the problem is economic; that is, the dredging operation should not be condemned merely because the tailings piles offend the eye; but facts should be obtained to show what the community and state get in return for the loss of the land, and whether or not the destruction of the land is justifiable. Should the dredges be compelled to resurface the land?

There is not time to go very thoroughly into the subject, but the important facts concerning it are as follows:

1. Most of the Oregon dredging operations are in very low value land, that is, farm land classed as grazing land, and having a value of from two to ten dollars an acre. Compare this per-acre value with the per-acre value as dredge ground. If we assume a 15-foot depth for gravel, with a recoverable gold content of 15¢ a cubic yard, the gross value would be $3,630 per acre. Considering that a large proportion of this $3,630 is spent directly in the local community and the state in the form of wages, supplies, repairs, taxes, and capital expense, it is rather difficult to find adequate grounds for condemning the dredging operation.
2. On medium value land - that is, land valued at around $30 an acre, such as the best land of the Sumpter Valley, the same argument holds good. If we make the conservative assumption that only half of the gross value of the land as dredge ground, or $1815 an acre, in the form of new wealth is spent in the community and the state, the bank interest on this amount would be greatly in excess of the return on the $30 land.
3. When we come to land valued at $100 an acre, we must look at the matter differently. While it would not be very difficult to show in most cases that the economic benefits derived from dredging are considerably greater than those from farming such land, there are other factors to consider. Probably in most cases it would be possible to resoil this land for about $100 an acre unless there are special problems. Land of this character usually has a top soil containing either no gold or a very low recoverable gold content. To make the most economical operation, disregarding the idea of resoiling, this top soil should be stripped or removed before the gold-bearing gravel is excavated and washed. If, then, the top soil should be stripped in any event, the added expense of resoiling should not be greater than around $100 an acre. In other words, it would be economically possible to dredge and resoil this character of land, provided the tract

was large enough to warrant the capital expense of resoiling machinery. There isn't much of this kind of dredgeable ground. There is some in the John Day valley. However, the big obstacle in the way of resoiling is the land owner. The average price paid for land by dredge operators is around $300 an acre. One would think that a farmer-landowner would be glad to accept $200 an acre for his land and receive it back after dredging in as good, if not better, condition for farming than it was originally. Such is not the case. The landowner wants to get the highest possible cash price obtainable for his land and doesn't care about continuing farming the dredged ground. He considers $100 cash for his land as farm land a good price and is not unduly concerned about the land being taken out of production. Under such circumstances, resoiling is not practicable.

4. The proportion of cropland taken out of production by dredging is exceedingly small. An estimate of a maximum of 10,000 acres of farm land including 2,000 acres of cropland has been made for Oregon. In the counties containing dredge land there are 2,796,665 acres of farm land and 518,361 acres of cropland. This means that the probability is that less than 0.3 of one percent of farm land and less than 0.4 of one percent of crop land could be taken out of production by dredging operations.
5. Apparently there is no lack of cropland in Oregon. In 1935 in five counties under discussion, cropland in the amount of 18,720 acres "failed", and 44,474 acres were "idle or fallow". Presumably a large part of this non-productive acreage could be made productive if the proper incentive existed, and this acreage may be compared to the few hundreds of acres taken out of production by dredging. Incidentally, about 20,000 new acres are being brought into production by the Owyhee project in Malheur county, and this area is close enough to the John Day valley so that alfalfa could be handled and transported at a low price.
6. Dredge operations produce new wealth which contributes in large measure directly to the welfare of the local communities and the state, and, without this new wealth, the county and state economies would be materially affected. In 1938 the dredge companies spent around a million dollars in taxes, wages, salaries, repairs, plus an unknown but very substantial amount in purchase of land.

In view of these facts, people should be slow to condemn dredging operations for destroying farm land until all the factors are appreciated. Such farm land could be preserved, possibly, by regulatory action, but in such an event it is probable that the dredging industry would be seriously affected, if not destroyed, with the attendant loss of revenue to the state.

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

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I am particularly interested in the following branches of Geology: _____

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Sponsored by: _____
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I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

All lectures held in Auditorium, Public Service Building, 6th & Taylor.

MAKE NOTES OF FOLLOWING DATES

Friday May 10 — Speaker: Mr.Claire P.Holdredge, Consulting Geologist, Portland, Oregon
Subject: GEOLOGICAL WANDERINGS IN COLOMBIA.
Most of the members of this Society know that Mr. Hodredge recently returned from a two-year sojourn in South America and have been anticipating the occasion when they might hear the story of his experiences there. So here it is - note the date and reserve it! He will tell us of the geography and culture of Colombia, as well as the geology of that region and the nature of his work there. In addition, he will show two reels of movies, most of which are in color.

Thursday May 16 — Don't forget the noonday luncheon of the Society at L'Abbe Restaurant. Last week we had a very large attendance. Come and join us, and let's fill the room.

Saturday & Sunday May 18-19 — Cannon Beach and Wolf Creek Highway Trip.
Those who can leave Saturday and desire passengers will assemble on SW 14th Ave. between Main and Jefferson by 1:30 p.m. Full cars may proceed to the Wolf Creek Junction at Sunset Camp north of Timber. Several stops will be made along the road between Sunset Camp and the Coast Highway. The caravan will leave Cannon Beach Postoffice at 9:00 a.m. Sunday. Much of the time will be spent in the Ecola State Park, where fine structural geology is to be seen. The remainder of the time will be spent on the beach south of Cannon Beach proper.
Leader: H. B. Schminky.

Thursday May 23 — Noonday luncheon at L'Abbe Restaurant.

Friday May 24 — Speakers: Dr. E. T. Hodge, C. P. Holdredge, Wayne Lowell, A. M. Piper
Subject: GEOLOGY OF GRAND COULEE REGION - A SYMPOSIUM.
This symposium has been specially arranged for this date in order to give those who are going on the Society's trip to Grand Coulee a preview of the geology of that unique area. However, this will be an evening of outstanding interest to all - whether one plans to go on the trip or not. Each speaker is familiar with one or more phases of the subject and slides will be used to show photographs, maps and block diagrams of the area. This is an exceptional chance to get a good insight into the geology of a formation, which, it is claimed, is the only one of its kind in the whole world on so vast a scale.

Thursday May 30 — Memorial Day - no luncheon meeting!

May 30 June 2 — Grand Coulee and the Ginkgo Petrified Forest Trip.
Thursday: Open house at Dr.Beck's geology Lab. Central Washington College of Education, Ellensburg, Wash., from 2:00 to 5:00 p.m. Thin sections of wood can be studied at first hand. This will be followed by a get-together dinner at the New York cafe.

A lecture meeting covering the geology of the coulee and scabland region will complete the day.
Auto camps and hotels are available for the night at Ellensburg.

Friday: Visit the Ginkgo Forest and enter the Grand Coulee. The night will probably be spent at the damsite.

Saturday: Complete the study of the Coulee and visit the dam. The night may be spent at the dam.

Sunday: Return to Portland. At this time, no plans are outlined for stops on the return trip.
Full details on the trip will be released as rapidly as they are completed. Reservations for the trip may be made with any member of the trip committee and should be made as early as possible.
Leader: Dr. George F. Beck, professor of geology, Central Washington College of Education. Dr.Beck has been released from class work to lead this trip for us.
Mileage - approximately 800 miles.
Everyone intending to make this trip is requested to meet after the lecture May 24, to arrange for passengers and learn final details.

Friday June 14 Speaker: Dr.O.F.Stafford,Professor of Chemistry,University of Ore.,Eugene.
Subject: THE CHEMICAL ASPECTS OF ALUMINUM.
This lecture, originally arranged for May 24, has been moved forward to allow the symposium on Grand Coulee to take place immediately before the Society's trip to that area.
With the coming of the aluminum industry on a large scale to our locality, the story of the nature, sources and productions of this ever increasingly used metal becomes one of transcending interest. Dr. Stafford will present this story without using chemical terms, so that those who are not familiar with such will gain intimate inside information on what lies behind this industry and the problems involved in the production of the metal.

Sunday June 16 The Coast Range in the vicinity of the North Yamhill river. This is an area entirely new to us.
Leader - Lloyd Ruff.

Sunday June 30 Badger Lake to Tygh Valley. This is another region that is new to the Society.
Leader - A. W. Hancock

July 4-7 Keep these dates open for another four-day trip.
Details will be released as soon as the leader confirms this trip.
Please do not think that the trip committee is trying to bankrupt members in scheduling these long trips, for they will take the place of a summer camp. Labor Day and Armistice Day will furnish two more long caravans.

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CHANGE IN ADDRESS

Mr. and Mrs. Earl K. Nixon	702 Woodlark Bldg.
Mr. and Mrs. F. W. Libbey	702 Woodlark Bldg.

The Portland office of the Department of Geology and Mineral Industries has moved from 329 SW Oak. St. to 702 Woodlark Building, corner SW Alder and 9th Avenue.

TOURING WESTERN UNITED STATES IN KODACHROME WITH RAY ATKESON.

Regular Meeting of April 26.

When, forty-eight hours before a much advertised lecture is to begin, the program committee receives a telegram from the lecturer stating that circumstances beyond his control prevent his coming, medical attention for heart failure is likely to be required for the committee members! Such a telegram was received from Mr. Loder two days before he was to show us his colored movies. It was a heavy blow, but fortunately, far from being a knockout!

The committee took action immediately and, with faith in the policy of reciprocity which prevails between the Mazama Club and our Society, beckoned one of the Mazama members to its aid, and the invitation was promptly and cordially accepted.

And so it came to pass that our meeting on April 26 was devoted to the showing of over three hundred kodachrome slides by that prince of scenic photographers, Ray Atkeson. With only two days notice, he "came across" in regal style and, as a fitting tribute to the excellence of his art, he had a large audience, included in which were many of his fellow Mazamas.

Ray has had to "go places" to get those pictures and, not only that, but he evidently possesses the necessary modicum of ubiquity, which puts him in just the right spot, with camera all set, exactly when "IT" happens! And "IT", as his slides proved, ranged from sunrises seen from mountain tops, to sunsets from ocean shores; rainbows reflected in rivers; the gnarled giants of the forests and the storm-battered veterans at timberline; fantastic forms in snow and glittering grottoes in ice; glaciers and gorges; caverns and cataracts; seascapes and cloudscapes - all portrayed in their majestic moods, with an artistry and a sense of harmony and composition which is the key to the fame which Ray Atkeson's pictures possess.

The evening was a realistic tour of western United States. If criticisms may be offered, it is that he did not leave his audience long enough to absorb the beauties of one place before he whisked them off to another - even more beautiful. So it was that they were taken from Mt. Hood to Mt. St. Helens; from Mt. Adams to Mt. Jefferson; from the Columbia Gorge to the Oregon Coast; then down past Crater Lake and on thru the National Parks to the south- Yosemite Valley; Zion, Bryce and Grand Canyons, and Death Valley.

Then, from Nature's scenic wonders, he took them to man's colorful creations at Treasure Island and, in a series of a dozen or two slides, all remarkably true in their color representation, he showed how modern science has achieved in no mean measure, the display on a large and beautiful scale, of some of the color effects one sees in the handicraft of Nature.

So the evening came to a close, leaving one with the certain knowledge that there is still very - very much left to be seen in America!

C.P.R.

LUNCHEON NOTES

Our Thursday luncheons continue to hold as much interest as ever for those faithful ones who attend regularly, and a wonderful spirit of friendliness and informality prevails. Scarcely a luncheon passes without a welcome being extended to some member who has been away, also to guests being introduced by their host or hostess. Geological specimens of various kinds are brought by different members and passed around. Each week Tom Carney does himself proud by bringing some exceptional crystal or gem specimen from his extensive mineral collection.

Men have always been in the majority at these luncheons, but attendance of women members is increasing. Mrs. Everett Williams has recently joined them, and, from the ranks of our newer members, Mrs. K. P. Mahoney and Mary Robertson. Also, on May 2, Mrs. Chas. Crogster was with us again after a long absence, as well as Mrs. R. L. Baldwin.

During April, the group had the pleasure of greeting Claire P. Holdredge, a charter member, who surprised most of us by his presence. He recently returned from a trip to Colombia, South America, where he spent nearly two years.

On April 25, the day on which the State Department of Geology and Mineral Industries was in the process of moving to their new quarters in the Woodlark Building, Wayne Lowell and H. B. Wood took time off to have lunch with the group "just as they were!"

In the absence of our president and vice-president from a recent luncheon, our secretary, Rose Jennings, presided, thus attaining the distinction of being the first woman of the Society to wield the gavel at one of our functions. Rose did "right well", too, and her sister members are really proud of her!

On May 2 Franklin Davis and his bride attended the luncheon and were warmly welcomed; they are making their home in Salem. Another member from Salem, W. A. Reeves, "dropped in" with his usual, genial smile; he joins us once in every four or five weeks. Arthur Piper presented Mr. and Mrs. John W. Robinson as guests; Mr. Robinson, a geologist, recently joined Mr. Piper's department of the US G.S. Tom Carney introduced as his guest, Mr. Chang Wen-Ti, who is in charge of the jade exhibit now on display in Portland. Mr. Chang gave an interesting, though brief, talk about his collection.

Much interest in being shown in the contemplated trip to Grand Coulee and, at the same luncheon, Tracy Wade, our Service chairman, passed around a small pamphlet concerning that area, taking orders for those desiring copies. Kenneth Phillips also showed a copy of J. H. Bretz's book, a splendid account of the Grand Coulee country, which is elaborately illustrated with topographic maps, block diagrams and photographs. He, too, would be glad to order a copy for anyone.

Many more places are available for our members at L'Abbe's restaurant every Thursday; we hope more will join this friendly group.

F.M.R.

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In our last issue where we gave the list of committee members for 1940, the name of Carl P. Richards should have been added as a member of the Editorial Committee.

THE SOLAR AND THE LUNAR ECLIPSE IN APRIL 1940

by Carl Price Richards

The much heralded partial eclipse of the sun, scheduled to appear over Portland, Oregon, at mid-day on Sunday, April 7, 1940*, took place exactly as the astronomers predicted; but, in addition, the "cloudy skies and light rain" also prevailed - exactly as the weather-man predicted! Although it was not a complete "black-out", the result was highly exasperating to astronomy fans, because the partially eclipsed sun and the clouds played a sort of hide-and-seek game throughout the two and a half hours of the eclipse.

Hence an endeavor to obtain a photographic record of the spectacle by making an exposure every five minutes on one film in a fixed camera, proved to be a hit-and-miss affair, with only about half the exposures recording the image of the sun. The resulting photograph shows a row of such images irregularly spaced, because the disc of the sun was not always visible when the five-minute interval ended and the exposure had to be made. And some of those which do show are not very sharp, as they are seen thru strongly illuminated clouds.

However, the picture is not entirely without value, for a careful study of it reveals the process of an interesting incident in celestial mechanics which took place in those two and a half hours.

Due to the rotation of the earth on its axis, the sun moves across the sky from east to west. For the same reason the moon also moves across the sky in the same direction, but, owing to its revolution around the earth in the opposite direction every twenty-eight days, its apparent east-to-west motion is slower than that of the sun. The difference in rate of apparent motion of sun and moon is such that when the moon passes between the earth and the sun, and is in the same plane, it takes two or three hours to cross the sun's disc.

A study of the successive images in the photograph shows this progress of the moon. In the earlier or left hand views, it is the lower right portion of the sun's disc which is obscured. In the later views to the right, the moon is seen in front of the lower left of the sun.

At the time of greatest phase, 1.06 p.m., the sun was not visible because of heavy clouds, but two minutes later it appeared with moderate clearness thru an opening, so the five-minute schedule was forsaken to obtain a view of the eclipse as nearly as possible at its maximum. Several of the exposures after that one also varied from the regular five-minute interval in order to catch the sun as it momentarily appeared thru a thin place in the clouds. The illumination of the clouds in these thin places was almost as bright as the sun itself, so the outline of the sun's disc does not stand out as it does in some of the other exposures.

Another feature worthy of note in the picture is the form of the path marked out by the successive images of the sun. It is seen to be a very flat arc, with its concave side above, or to the north. This is due to the sun being, at that time, north of the celestial equator. If a similar picture were taken at either of the equinoxes, when the sun is right on the equator, the series of images would be in a straight line. Also, if a composite photograph of this kind were taken between September 22 and March 22, the curvature of the path would be reversed, or concave to the south, as the sun is then nearer to the south celestial pole.

The second eclipse in April was what is known as a "lunar appulse", or a "penumbral eclipse of the moon". The shadow of the earth projects into space in the form of a slender cone of umbra, or dense shadow. From any place within that cone the sun is invisible, or totally eclipsed**. Outside and all around that cone is a region of partial shadow, or penumbra, which is fainter the farther it is radially from the umbral cone. From any point within that penumbra the sun is only partly visible, or partially eclipsed.

When the moon in its revolution around the earth enters the slender cone of umbra, the light of the sun is shut off from the lunar surface and it becomes more or less invisible. But, when the moon merely enters the region of partial shadow, or penumbra, the brightness of its surface is only very slightly dimmed.

Such an eclipse is termed a lunar appulse, and it was such a one that occurred on the evening of April 21. It, too, took place exactly as the astronomers predicted; and, on this occasion, the weather-man relented, and gave astronomy fans a good break, for the sky was beautifully clear thruout the entire period.

There was nothing spectacular about the event; in fact, the majority of people might have looked at the moon at the time of maximum phase of this appulse and not have noticed anything different from an ordinary full moon, so slight is the effect of the penumbral shadow on the moon's brightness. To critical observers, however, there was a perceptible dimming of the southern area of the moon's surface. But that appearance was apparent only for about forty minutes, and during the rest of the time which elapsed from the beginning to the end of the eclipse, the lunar disc beamed forth with its accustomed brilliance.

The times of the appulse were as follows:- First contact, 6.28 p.m., P.S.T. Mid-phase, 8.27 p.m. Last contact, 10.26 p.m. At the time of mid-phase the southern limb of the moon was within two minutes of arc of the umbral shadow cone.

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*See "Annular Eclipse of the Sun, April 7, 1940", pages 40-41, GEOLOGICAL NEWS-LETTER, vol.6 no.6, March 25, 1940.
**See "Total Eclipse of the Moon, May 13-14, 1938", pages 144-147, GEOLOGICAL NEWS-LETTER, vol.4 no.13, July 10, 1938.

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DOINGS OF OUR MEMBERS.

Earl K. Nixon, Director of the State Department of Geology & Mineral Industries, has been granted a short leave of absence to investigate iron ore possibilities in Peru, South America. He will travel by plane, and return early in May.

A. D. Vance spoke to the Oregon Agate & Mineral Society Friday April 19. Subject: Collecting Invertebrate Fossils in Northwestern Oregon.

Dr. E. T. Hodge will speak to the Oregon Agate & Mineral Society Friday May 17th. Subject: Minerals and the War.

AN UNUSUAL AURORAL DISPLAY
As seen from near Maupin, Oregon, on March 29, 1940.

by Kenneth N. Phillips

"On very rare occasions the aurora (borealis) appears as an arch of light across the heavens from east to west". (Webster's New International Dictionary, Unabridged, 1917, p.154).

The above quotation may not be sufficient to identify the phenomenon to be described as a feature truly a part of an auroral display. However, it was associated with a simultaneous display of northern lights, and the occurrence is sufficiently rare and interesting to merit observations of it being recorded.

March 29, 1940, was a stormy day in western and central Oregon. Near Prineville, where the writer was working with M. L.Hillegar making stream-flow measuremens, a cold rain fell all morning, accompanied by a driving wind from the southeast. Rainfall was general over north-central Oregon. About noon the rain ceased, and a dry south to southwest wind sprang up, blowing at timeswith gale force and causing local dust storms from mid-afternoon on. By late afternoon clouds had disappeared except for low nimbus over the Cascade Mountains and stray cumulus farther east.

At 8:20 p.m., while driving toward Portland on The Dalles-California Highway at a point about 15 miles southeast of Maupin, both of us simultaneously noted an unusual display in the northwest. The sky was suffused with light over an area extending from about N.45° W. to N.10° W., the brightest area being a little to the left and below Cassiopea, and reaching to a height of about 25 or 30 degrees above the horizon. These limits were nowhere sharply defined, but faded off gradually. In this area there were several (perhaps half a dozen) rays of light, extending from the horizon upward at an angle of about 80 degrees with the horizontal, with upper part to the left or south. These rays seemed to be straight and parallel. We did not observe any color in the display at this time. There was no flickering or movement of the light, and at the time we were not at all sure that it was the well-known aurorea borealis, which neither of us had ever seen before. Later, we learned from the newspapers and other reports that a display of "northern lights" had occurred at this time.

At about 8:25 p.m. we noted an unusual "cloud" in the north or northeast,whose appearance was so striking that we stopped the car and braved the raw night wind for a better view. This cloud was a broad band (possibly 10 degrees wide?) which extended across the sky somewhat in the shape of a great horseshoe, one end near the upper extremity of the auroral display in the northwest, the center directly overhead, and the other end in the northeast, beginning and ending perhaps 30 degrees above the horizon. Three unusual features immediately marked this cloud as something out of the ordinary: (1) it was brightly luminous, in marked contrast to scattered blue-black cumulus clouds; (2) it was transparent the stars being plainly visible through the cloud at all points; and (3) its components appeared to be laminated or arranged in rows, particularly at the northeastern end, suggesting in appearance a white horse's tail. The cloud did not at a glance appear to be moving; but over a period of about 15 minutes it moved considerably to the south, against the direction of surface wind. When last seen about 8:40 p.m., it was a considerably narrower and nearly straight band of light extending across the sky from east to west, perhaps 30 degrees south of the zenith. At no time did it show any color other than white light.

As we drove on, we noted other travelers stopping to view the light. None had a plausible explanation for its occurrence.

The local character of the display seems to be substantiated by reports of observers in Portland who saw the luminous cloud in the southeast at the same time, 8:30 p.m. One observer, George West, who saw the display from southeast Portland, reported that it was almost due southeast at 8:30 p.m., extending apparently from the horizon up to 45 degrees or more above the horizon, top inclined to the right, resembling a "cylinder of light" as a searchlight beam with parallel margins. The sky at Portland was not wholly clear, and the entire display may not have been visible.

Reflected sunlight could not have been the source of the light observed. The sun had set at 6:30 p.m.; the moon was not due to rise until 1:25 a.m. In order to be in sunlight at 8:30 p.m., the cloud would have had to be approximately 1200 miles above the earth's surface, where it would have appeared as substantially in the same direction to observers over a large radius.

As we drove on toward Maupin, the cloud of light disappeared quickly. The parallel rays of light in the northwest gradually faded, and in their place appeared a single ray, slight curved, concave to the left, and showing faint rainbow colors, red at the left. This ray lasted only a few minutes, and there were no further appearances. However, the northwest sky continued to be unusually bright until we entered a rainstorm near Mount Hood about 10 p.m.

- Kenneth N. Phillips 3-30-40

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The phenomenon described by Kenneth N. Phillips reminds me of a similar one I observed eleven years ago. In consulting my diary I found the following record:

> March 11, 1929.
> While coming home from the show at 11:00 p.m. I saw a light in the sky, a rather nebulous light forming a streak like the milky way. Its projection on the Earth's surface made an angle of about 60° with the north.
>
> It kept getting brighter until about 11:30 p.m. when it was quite bright. It looked like a giant search-light shining out of the northwest, across the zenith and down in the southeast (if you can imagine the beam of a search light curving in a great arch from horizon to horizon).
>
> The light was a white glow with diffuse edges. It gradually shifted a little south and then separated in the middle and faded out.
>
> The whole sky was covered with a faint cloudy light, mottled with dark spots. A bank of clouds in the north obscured the aurora borealis which seemed to be in evidence. If extended on around the earth, it (the arch) would probably line up with the sun, which suggests to me that it might be caused by an electronic stream from the sun. It was witnessed by about a dozen boys at the hall (MacCormick Hall, Pacific University).

March 12, 1929.
Last night's phenomenon prompted me to look for a sun spot. Sure enough, there was a very large one on the lower side - apparently two very close together. I observed it with a small 20-power glass.

As I recall the spectacle of 1929, the beam of light was quite narrow in the northwest (about ten degrees wide) and flaring to about twice that width in the southeast.

The phenomenon is a rare variation of the aurora borealis which is most in evidence at times of great solar activity. Severe magnetic storms frequently accompany the spectacular display of the aurora and both are surely related to solar activity, but the exact relationship is not known.

Stormer, a Norwegian who has studied the aurora a great deal, says there are two kinds of polar lights: those produced by direct ultra-violet radiation from the sun and occurring only in the extremely tenuous atmosphere at heights in excess of 600 miles, and those produced at lower elevations in the shadow of the Earth by corpuscular radiation from the sun. This corpuscular radiation consists of streams of electrons and ions (electrically charged atoms) thrown out from sun spots and other areas of activity on the sun's surface, and is curved around in great spirals by the Earth's magnetic field. It is a well known fact that such radiation can only reach the Earth near the magnetic poles because of the effect of the Earth's field. Cosmic rays are found to be more intense near polar regions for the same reasons.

The Earth's magnetic field, however, is greatly affected during these ionic bombardments either because of the direct influence of the ionic streams, or because of shifting charges, in the Earth's atmosphere, or in the Earth itself.

Sunspots may appear any time but are largest and most abundant periodically every 11 years. We are just passing through a high in sunspot activity (1939-40). Eleven years ago (1928-29), at the time I observed the auroral arch, we were also emerging from a sunspot maximum. Sunspots occur in a belt on the sun's surface about 50° each side of the sun's equator*. The sun's equatorial belt seems to be lagging behind the rest of the sun in its rotation. Perhaps sunspots are giant vortices created in this current in the chromosphere. Spectroscopic evidence indicates that there are circular currents of ions and strong magnetic fields in sunspots.

In these areas whirling gases may cause a cyclonic expansion and consequently cooling of the central area to 4000° C. giving the appearance of darkness in contrast to the intense incandescence of the surroundings at 6000° C.

It is suspected that the sun propels streams of ions out of these thinned areas in the chromosphere by light-pressure at speeds up to 1000 miles per second. The ionic stream seems to be limited, approximately, to a 60° cone about the vertical. In approximately 26 hours after a sunspot approaches within 30° of the center of the sun's disc, magnetic disturbances are felt on the earth.

I suggest that there may be a focussing action by the earth's magnetic field on the ionic stream as it spirals in toward the poles, to account for the restricted band of light seen in the auroral arch.

* Abeiti: The Sun

Molecules of gas in our own atmosphere produce a transformation of some of the energy of the ion streams into light energy thereby producing the glow of the aurora.

Much has yet to be learned as to what causes sunspots and whether ionic and electronic radiations originate solely in dark spots or in other areas as well.

I think that it is important that anyone observing this phenomenon or anything similar make A carefully written report of the time, appearance, duration and extent of the display and send it to the bulletin. I am especially interested in finding whether this is restricted to the winter months, and would like to strengthen the correlation with solar activity. Perhaps we shall have to wait until March 1951 to see a reoccurrence of the auroral arch.

- Jesse R. Watson
Professor of Physics,
Pacific University.
4-13-40

GEOLOGICAL NEWS LETTER

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THE GEOLOGICAL NEWS-LETTER

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Arthur M. Piper	K. N. Phillips
Ray C. Treasher	Carl P. Richards

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

All lectures held in Auditorium, Public Service Building, 6th & Taylor.

MAKE NOTES OF FOLLOWING DATES:

Thursday May 23 — Don't forget the noonday luncheon of the Society at L'Abbe Restaurant. Last week we had a very large attendance. Come and join us, and let's fill the room.

Friday May 24 — Speakers: Dr. E. T. Hodge, C. P. Holdredge, Wayne Lowell, A. M. Piper

Subject: GEOLOGY OF GRAND COULEE REGION - A SYMPOSIUM.

This symposium has been specially arranged for this date in order to give those who are going on the Society's trip to Grand Coulee a preview of the geology of that unique area. However, this will be an evening of outstanding interest to all - whether one plans to go on the trip or not. Each speaker is familiar with one or more phases of the subject and slides will be used to show photographs, maps and block diagrams of the area. This is an exceptional chance to get a good insight into the geology of a formation, which, it is claimed, is the only one of its kind in the whole world on so vast a scale.

Everyone intending to make this trip is requested to meet after the lecture on May 24 to arrange for passengers and learn final details.

Thursday May 30 — Memorial Day - no luncheon meeting!

May 30 - June 2 — Grand Coulee and the Ginkgo Petrified Forest Trip.

Thursday: Open house at Dr. Beck's geology Lab. Central Washington College of Education, Ellensburg, Wash., from 2:00 to 5:00 p.m. Thin sections of wood can be studied at first hand. This will be followed by a get-together dinner at the New York Cafe.

Later in the evening Dr. Beck will tell something of what the fossil trees reveal about the climate throughout the ages.

Auto camps and hotels are available for the night at Ellensburg.

Friday: Visit the Ginkgo Forest and enter the Grand Coulee. The night will probably be spent at the damsite.

Saturday: Complete the study of the Coulee and visit the dam. The night may be spent at the dam.

Sunday: Return to Portland. At this time, no plans are outlined for stops on the return trip.

Full details on the trip will be released as rapidly as they are completed. Reservations for the trip may be made with any member of the trip committee and should be made as early as possible.

Leader: Dr. George F. Beck, professor of geology, Central Washington College of Education. Dr. Beck has been released from class work to lead this trip for us.

Mileage: approximately 800 miles.

Friday June 14 — Speaker: Dr.O.F.Stafford,Professor of Chemistry,University of Ore.,Eugene.
Subject: THE CHEMICAL ASPECTS OF ALUMINUM.
This lecture, originally arranged for May 24, has been moved forward to allow the symposium on Grand Coulee to take place immediately before the Society's trip to that area.
With the coming of the aluminum industry on a large scale to our locality, the story of the nature, sources and production of this ever increasingly used metal becomes one of transcending interest. Dr.Stafford will present this story without using chemical terms, so that those who are not familiar with such will gain intimate inside information on what lies behind this industry and the problems involved in the production of the metal.

Sunday June 16 — The Coast Range in the vicinity of the North Yamhill river. This is an area entirely new to us.
Leader: Lloyd Ruff.

Sunday June 30 — Badger Lake to Tygh Valley. This is another region that is new to the Society.
Leader: A. W. Hancock.

July 4-7 — Keep these dates open for another four-day trip.
Details will be released as soon as the leader confirms this trip.
Please do not think that the trip committee is trying to bankrupt members in scheduling these long trips, for they will take the place of a summer camp. Labor Day and Armistice Day will furnish two more long caravans.

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CHANGE IN ADDRESS.

Mr. and Mrs. Paul W. Howell Camp Manning, Oregon, c/o State Highway Dept.

NEW MEMBERS.

Mr. and Mrs. Earl B. Kellmer MU 6002 6105 NE Rodney Ave.

NEWS OF OUR MEMBERS.

Once again we welcome the Musketeers back from a vacation. We understand they had quite a trip to Mexico. We hope to hear more about their trip Thursday evening, May 23, when the Society has a get-together meeting at the home of Dr. and Mrs. Jones.

Mr. Earl K. Nixon has returned from Peru. Later we hope to have him tell us some of the interesting things he saw on his trip to South America.

Dr. Adolph Weinzirl was one of the judges in the selection of the Queen of the 1940 Rose Festival.

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MINUTES OF THE FIFTH ANNUAL BUSINESS MEETING of the GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

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Meeting called to order at 8:15 p.m. February 23, 1940, in the auditorium of the Public Service Building in Portland, Oregon. President Piper presiding.

Minutes of the fourth annual business meeting, held February 24, 1939, were read by the Secretary and, in the absence of objection, were approved as read.

A report showing the status of the treasury as of February 23, 1940, and summarizing receipts and disbursements thus far in the fiscal year was read by the Treasurer and, in the absence of objection, approved. A formal report as of the end of the fiscal year, February 29, 1940, to be submitted in writing to the Secretary at the earliest practicable date.

On behalf of Mrs. Robert Leigh, a treatise by Lambert Wood entitled "Geological sketch of the region of Tucson, Arizona" was presented to the Society by Mrs. H. Mildred Stockwell and accepted on behalf of the Society by the President.

The annual report of the Secretary was read and, in the absence of objection, approved.

The President cited and commended for their earnest collaboration the chairmen and members of standing and special committees, as follows:

Program:	Carl P. Richards, chairman
Field Trips:	A. D. Vance, chairman
Membership:	Leo F. Simon, chairman
Museum:	J. C. Stevens, chairman
News Letter & Library:	R. L. Baldwin, editor-in-chief
Public Relations:	Clarence Phillips, chairman
Service:	Tracy Wade
Auditing:	E. A. Boyrie, chairman
Nominating:	Leo F. Simon, chairman
Banquet:	Dr. Courtland Booth, chairman

Moved by Clarence Phillips, passed, and ordered: That the reading of reports by the several committee chairmen be waived and that written reports be duly filed with the Secretary.

Moved by Kenneth Phillips and approved: That the following resolution be adopted and a copy transmitted to the management of the Public Service Building:

"Be it resolved that this Society express its appreciation and gratitude to the management of the Public Service Building Company for the use of its auditorium and for the many courtesies extended by its employees in connection with the lecture meetings of the Society".

Moved by Carl P. Richards and approved: That the following resolution be adopted and a copy transmitted to the manager of the Reed College Commons:

"Be it resolved that this Society express to Reed College and to the management of the Reed College Commons its appreciation of courtesies extended in connection with the annual banquet and entertainment of the Society to be held at the Commons on Friday, March 8th next".

Moved by A. D. Vance and approved: That the following resolution be adopted and copies transmitted to appropriate representatives of the Press in Portland:

"Be it resolved that this Society express to the Press of Portland and vicinity its appreciation of and its gratitude for the many courtesies extended to it through publication of news items pertaining to activities of the Society".

Moved by H. B. Schminky and approved: That the following resolution be adopted and a copy transmitted through Mr. Leo F. Simon to the Oregon Audubon Society:

"Be it resolved that this Society express to the Oregon Audubon Society its gratitude for occasionally granting the use of a projection lantern at its lecture meetings, also to Mr. Leo F. Simon for so faithfully transporting and operating the latern gratis".

Moved by Dr. Courtland Booth and approved: That the Society extend to the chairmen and members of standing and special committees its appreciation and thanks for their very competent service during the year.

The report of the Secretary on the letter ballot for offices in the Society in the year beginning March 1, 1940, was read. Moved by A. D. Vance and approved: That the unanimous letter ballot in favor of the regular ticket of nominees be considered a unanimous ballot of the whole Society for that ticket, as follows:

President:	J. C. Stevens
Vice-President:	A. W. Hancock
Secretary:	Rose Jennings
Treasurer:	Helen Iverson
Director (3-year term ending Feb.28, 1943):	Clarence Phillips

The newly elected and the retiring officers and directors of the Society were presented to the membership.

Meeting adjourned 8:50 p.m.

Norma Y. Piper
Secretary

****

OREGON PIONEER TRAILS.

Departing from the usual study of geology, the Feb.11th caravan of the Geological Society of the Oregon Country, was devoted to Oregon history, particularly that pertaining to early roads. Under the capable leadership of Mr. Earl A. Marshall, whose two grandfathers were Oregon pioneers, the party traveled over 17 miles of Skyline Blvd. from Sylvan to Logie Trail road, then westward into the "plains" area north of Hillsboro. Fog throughout the morning along the heights obscured the surrounding country, but the weather was clear in the afternoon.

Mr. Marshall has made an extensive study of the old roads and other historic points in the area visited. At the first stop, Sylvan, he led the group on a short hike to see a remnant of the grade of the first road built out of Portland to the west. The road was built in 1845 by Lovejoy and Pettygrove, the founders of the city of Portland. It was the first of five successive "canyon" roads leading to the Tualatin plains, then known as "the plains". In 1851, when a government surveyor was running a base line, he recorded this as "an old road from Portland to Tualatin plains". It was abandoned in 1852 for a better route. The old grade can be followed about 1,000 feet along the canyon of Fanno creek, at its extreme head.

The "Mountain" road, another of this period, began at the Stark street ferry, went through the present City (Washington) park, over Arlington Heights, near the present KOIN radio station, down the hill and forked. One fork went to the home of Joe Meek, on the plains, and the other fork extended to the Walker road. Little is now left of the old "Mountain" road.

Following the Skyline Blvd., the next stop was made to see what was known as the fur trappers' trail, or Joe Meek's trail. The group hiked along this old trail about three-quarters of a mile, through a forest. It was used by Joe Meek and others as a skid road, since it was not wide enough for wagons and teams. Mr. Marshall, through interviews with old settlers, learned that they used two horses, tandem, to draw a sled over the route in order to bring produce into Portland from their farms. The American fur traders used the trail, and persons going into the plains from Vancouver to take up donation land claims. A grandfather of Mr. Marshall traveled over this trail in the early forties, having joined a fur trading party. The trail was probably abandoned altogether by 1850 and has since remained untouched. Inspection of the trail indicated that it must have been hard to travel, especially in winter. The old Land Office map shows this trail as passing the homes of such old settlers as Caleb Wilkins, "Squire" Ebberts, and Joe Meek, all of whom lived in the plains. Some old stringers may still be seen where the trail crossed Rock Creek.

The remains of an apple and pear orchard were seen at one point along the trail, adjoining a small clearing that was once a homestead. Nothing is left except the moss covered fruit trees and a grapevine or two. A forest of firs has grown up in the orchard, completely surrounding the fruit trees. It is known as the "old deserted orchard".

A section of a third route into the plains was next seen. This was the original Springville road, built during the period when the town of Springville was a rival of Portland. Mr. Marshall stated that a tremendous lot of wheat came out of the plains over this route in the days of 1849 and 1850. The road is shown on an old plat of 1852. It went up to an elevation of 400 feet higher than the

road in the canyon, known as Canyon Road gap, and was a tortuous route. As a result, the better canyon road route into Portland put this city ahead. The old road was abandoned in the early sixties, when it was relocated on another route. Its route can be followed for a long distance. The Claremont tavern in the Linnton district was built on the site of the town of Springville.

The old Linnton road, built in 1843 or 1844, was pointed out at the next stop along the Skyline Blvd., at the place where it came up the main ridge. It was built by Peter Burnett and McCarver, who founded the town of Linnton. It went up the side of the bluff, having a grade of about 35%, and was perhaps the worst of all the roads built during that period. Both Burnett and McCarver, soon after establishing Linnton, abandoned it. Burnett, afterward, was the first elected governor of California. McCarver founded Tacoma, Wash. This road joined the Germantown road and, like all the rest, ended at Joe Meek's home.

Just before leaving Skyline Blvd. the caravan stopped at a point overlooking Sauvies Island. Here the leader told some more interesting Oregon history. On the western edge of the island could be seen the old Moar farm, which was once a Hudson Bay company milk ranch. Close to the water's edge Nathaniel Wyeth built a fort in 1834. When the Hudson Bay company later took over this fort, it placed a man named Logie in charge of the milk ranch. Logie built a pack trail for the Hudson Bay company to the Tualatin plains. The American brigades traveling to California from Fort Vancouver, came by boat to Fort William on Sauvies Island, then across to the mainland and up over the hill via the Logie trail, down to the plains and southward to California. The trail up the hill was traversed with difficulty. As many as 500 pack horses would come up the trail at one time. The horses were kept at what was called the horse ranch, on the donation land claim of Charles McKay, on the plains. This ranch extended north and east of North Plains, first called Glencoe, situated at the southwest corner of the ranch. When needed, the horses were brought over the Logie trail to meet the boats crossing from Fort William. It is said that Dr. McLoughlin always accompanied the brigades from Fort Vancouver to Fort William, and as far as the plains.

On their way to the plains and California, or returning to Fort Vancouver, the brigades would often camp and rest at a spring near the Logie trail, not far from the top of the ridge. The Geological Society caravaners had lunch at this same spot, and at the same time enjoyed some welcome sunshine. The old spring was investigated and found to be at this time a number of tiny bubbling springs scattered about the site. Mr. Marshall explained here that the object in going over the ridge to the Tualatin plains was to go on south in open country. One-half to two-thirds of the valley was open country at that time.

The first trail built by the Northwest Company went over the mountains from Scappoose Bay, following Scappoose creek to the headwaters of the Nehalem river, then to the east fork of Dairy creek.

There was a territorial road from St.Helens to the Tualatin plains. It had terrific grades of 25 to 30 percent. It crossed the ridge at an elevation of 1,450 feet. It had little chance to compete with the low elevation of the canyon road. The Logie trail, leading toward California, rounded the west base of the Chehalem hills, crossed a ford of the Yamhill river at Lafayette, followed the valley to a bend in the Willamette river at Independence, on to Corvallis, Eugene, Cottage Grove, Yoncalla, and southward.

After the lunch stop, the group proceeded into the Tualatin valley to see what is claimed to be the oldest Protestant church still standing west of the Rocky Mountains. This is the West Union Memorial Church, erected in 1853. Services are held now only once a year. In the little adjoining cemetery are buried "Squire" George W. Ebberts, one of the first five "mountain men" to settle in Oregon, and Caleb Wilkins, both of whom, by their votes at Champoeg, helped keep the state of Oregon a part of the United States. The "mountain men" were fur trappers who gave themselves that name.

The site of Joe Meek's home was pointed out by Mr. Marshall as the group traveled along the countryside to another cemetery where Mr. Meek's grave was seen. He was Colonel Joseph L. Meek, another of the voters on the Oregon question at Champoeg. The church beside the cemetery is the Tualatin Plains Presbyterian Church. The trip was officially ended at this church, but several of the group then visited an old Catholic church in the neighborhood, built in 1875, on the grounds of which are a number of beautiful old sequoias. And at another place, in this same district, a stop was made to see more of these fine old trees. This was an avenue, 17 of the "Big" trees on each side, leading to the home of M. C. Mathison, on which is called the old Porter place. The trees are estimated to be 75 or 80 years old. Mr. Mathison stated that they grew from seed brought from California. This farm home is a short distance to the north and east of Forest Grove.

- E. M. Barr

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SEATTLE MEETING (NATIONAL) JUNE 17-22, 1940.

There has descended on to the Editor's desk a brief notice of the above meeting. In case any of our members are in the Seattle district on any of those dates, they will doubtless find some meeting or excursion of interest. The notice lists 26 participating organizations among which are the following:

Geological Society of America
Assoc. of Pacific Coast Geographers
Astronomical Society of the Pacific
American Geophysical Union - Section of Hydrology
Western Interstate Snow Survey Conference

Of the last mentioned our president, J.C.Stevens, is the local chairman.

On June 18, 19 and 20 there are evening meetings, each addressed by men of note; and, on June 22, 23 and 24, there are excursions to points of interest, including Grand Coulee; the Skagit Tour; the Dominion Observatory and other interesting and scenic localities.

Anyone interested may obtain more detailed information by writing to A. F. Carpenter, University of Washington, Seattle, who is chairman of the Local Committee.

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GEOLOGICAL NEWS LETTER

VOL. 6 NO. 11 PORTLAND, OREGON June 10, 1940

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Geological Society of the Oregon Country
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GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Executive Board

J. C. Stevens	President	434 NE Royal Court
A. W. Hancock	Vice-Pres.	2704 SE 84th Ave.
Miss Rose Jennings	Secretary	609 SW Lincoln St.
Miss Helen Iverson	Treasurer	5125 NE Couch St.
Clarence D. Phillips,	Director	
Ray C. Treasher,	Director	
Carl P. Richards,	Director	
Edwin T. Hodge,	Director	
Arthur M. Piper,	Director	

THE GEOLOGICAL NEWS-LETTER

Official Publication of the

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Editor-in-Chief and Business Manager

Raymond L. Baldwin
344 U. S. Court House
Portland, Oregon

Associate Editors

Edwin T. Hodge		A. D. Vance
Arthur M. Piper		K. N. Phillips
Ray C. Treasher	O.E.Stanley	Carl P. Richards

News-Letter issued semi-monthly on the 10th and 25th.

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All communications and material for publication should be sent to the Editor-in-Chief. Change of address is required 30 days in advance of the date of proposed change.

MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor

DATES TO MARK ON YOUR CALENDAR

Thursday June 13 Don't forget the noonday luncheon of the Society at L'Abbe Restaurant. Last week we had a good attendance. It was our first meeting in the new banquet hall L'Abbe Restaurant recently opened, just west of the room where we used to meet.

Friday June 14 Speaker: Dr. O. F. Stafford, Professor of Chemistry, Univ. of Oregon, Eugene, Oregon.
Subject: THE CHEMICAL ASPECTS OF ALUMINUM.
This lecture, originally arranged for May 24, has been moved forward to allow the symposium on Grand Coulee to take place immediately before the Society's trip to that area.
With the coming of the aluminum industry on a large scale to our locality, the story of the nature, sources and production of this ever increasingly used metal becomes one of transcending interest. Dr. Stafford will present this story without using chemical terms, so that those who are not familiar with such will gain intimate inside information on what lies behind this industry and the problems involved in the production of the metal.

Sunday June 16 Haskins Creek and North Yamhill River trip. Caravan will form at usual place, Front and Yamhill, 8:00 a.m. Reassemble at College Campus, Forest Grove, 9:00 a.m.
The morning route will be through the foothills of the Coast Range to Haskins Creek Dam where we will stop for lunch. Return trip will be by way of the North Yamhill Canyon. Many interesting exposures of tertiary igneous and sedimentary rocks are to be found in this area. This area is entirely new to us - scenic as well as geologic. Leader: Lloyd Ruff.

Thursday June 20 Members of the Society and their friends have a luncheon date at L'Abbe Restaurant!

Friday June 28 Subject: DEATH VALLEY IN COLOR.
Speaker: Prof. J. H. Jonte, College of the Pacific, Stockton, Calif.
The colorful story of the geological history of Death Valley and its adjacent mountain ranges will be presented to us by one who has visited this area several times as leader of parties studying its geology. Prof. Jonte will illustrate his talk with excellent motion pictures, all in natural color. For those who have not seen the vivid hues of Death Valley, this is a good opportunity to obtain a true picture of them; and those who have visited that fascinating region should bring their friends to relive that experience with them, through the medium of Prof.Jonte's lecture.

Sunday June 30 Badger Lake to Tygh Valley. This is another region new to our Society. Leader: A. W. Hancock.

Thursday JULY 4 No luncheon meeting.

July 4-7 Keep these dates open for another four-day trip.
Details will be released as soon as the leader confirms this trip.
Please do not think that the trip committee is trying to bankrup members in scheduling these long trips, for they will take the place of a summer camp. Labor Day and Armistice Day will furnish two more long caravan trips.

****

NEW MEMBERS

Miss Frances Wheeler	GA 8243	2944 NE 47th Ave.,Portland,Oregon
George Minturn	VAN.1232-W	400 E.22nd St.,Vancouver, Wash.

CHANGE IN ADDRESS

Mr.& Mrs.Franklin L.Davis, Route 4 Box 457A, Salem, Oregon

Below is an excerpt from a very recent letter from Franklin:
"We are now located on the Dallas road, 5 miles south of Salem, in a little country home which we enjoy very much. We have a brook gurgling thru the place, reminding me somewhat of the babbling of my old friend (deleted by the censors). The banks of the brook are strewn with large boulders, mainly basaltic. ** This palatial spot is located at the southern extremity of the Eola Hills which are chock full of geology. I have promised Bruce to submit the outline of a proposed trip through this area, and when I do, I shall certainly arrange to have the luncheon stop on the spacious lawn of my lower forty,- the members, of course, will bring along the ducks."

DOINGS OF OUR MEMBERS.

We are very glad to report that two of our members who have been spending some time at the Portland Sanatorium are well on the road to recovery. Mrs. Thomas A. Carney is recovering from an appendectomy, and will soon be at home. Mrs. Robert Campbell suffered many painful bruises but no bones were broken, when some lumber, on which she was riding in a trailer, slipped and rolled over on her.

SOUTH AMERICA CALLS AGAIN TO EARL K. NIXON

Earl K. Nixon left Portland by plane for New York City Sunday June 9th. From New York he planned to fly to Lima, Peru. Recently Mr. Nixon spent a short time in South America looking into iron ore production possibilities. He found further professional work would be necessary and, upon his return to Portland, offered his resignation as Director of the Department to the Governing Board of the State Department of Geology and Mineral Industries. At a recent meeting of the Board the members refused to accept Mr. Nixon's resignation and granted him two months' leave of absence. Due to unsettled world conditions he was unable to make definite plans beyond two months.

Several years ago Mr. Nixon spent two years in Venezuela on iron ore exploration, and members of the Society will remember his very interesting lecture describing the country, its people, and his work.

A dinner and get-together meeting of the Oregon Section of the American Institute of Mining and Metallurgical Engineers was held Saturday June 8th at Ireland's upstairs dining room at Lloyd's Golf Course Club House. The meeting was in honor of Earl K. Nixon, who will leave shortly for South America.

Friday May 31st Mr. Earl K. Nixon was the speaker at the luncheon of the City Club at Portland Hotel. His subject was "South American Ore and American Business".

Dr. Adolf Weinzirl was elected president of the Oregon Health Officers' Association at their recent session held at Astoria.

The following is from the May 17th Oregon Journal:

"Under the ashes and lava flows of Mount Mazama, which erupted geologic ages ago and subsided to become a cup for the blue waters of Crater Lake, science this week may find the answer to unsolved questions.

"Dr. L. H. Cressman, anthropologist, and Dr. Warren D. Smith, geologist, both of the University of Oregon, will accompany James Bramley, highway maintenance engineer, and Ray Treasher, mining geologist, of Grants Pass, on Friday to the Crater Lake highway near Nion Tucker's Flounce Rock ranch, 34 miles from Medford.

"There, on April 8, Bramley's highway crew dug under the lava flows and found a skeleton sitting in a hole 36 inches in diameter. The skeleton is now at the University of Oregon. Friday's expedition is to determine whether - like Vesuvius covering Pompeii - Mazama erupted so rapidly that the inhabitants of the territory were smothered in pumice and ashes and were buried alive.

"The cut which bared this skeleton was made from the side. If the party finds the pumice layer still sealed and unbroken on top, they will know that the eruption was rapid and overwhelming. They will also know that the skeleton is of a race living here before the upheaval.

"Bramley recalled that in 1924, when the road was being constructed, a skeleton was dug up at almost the same spot. Professor Lawrence, University of California geologist, in the district at the time, was highly interested and obtained the skeleton. He brought a party which dug in the area for more evidence to support his theory of a sudden gigantic eruption, but the effort was fruitless.

"The second skeleton was found within a few feet of where Lawrence dug."

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The members of our Society are in for a treat when in an early issue of the News Letter we will publish Mr. Thomas Carney's interesting article on Jade. In this article we will have a description of the Pagoda, the masterpiece of the recent jade exhibit, which we were recently privileged to see here. Tom will also take us to faraway Burma and Turkestan where jade is obtained, and then to China where the material is carved into the priceless treasures included in this exhibit.

LUNCHEON NOTES

On May 2nd Mr. Chang Wen-ti was the guest of Mr. Tom Carney at our Thursday luncheon. Mr. Chang was in charge of the Jade exhibit mentioned above.

On May 9th Miss Chang, daughter of Mr. Chang, was the guest of Miss Rose Jennings at our luncheon. This charming young lady made a brief talk and quite captivated us. She invited us to visit China and study its rocks, birds and flowers, with a special invitation to Leo Simon. The flowers of China, she told us, are not so beautiful as those of our country, but they are more fragrant. The Chinese Jade exhibit was well attended by our members, and was most worth while.

Constance Enders and Helen Iverson are also with us again after their trip to Mexico. They reported a delightful vacation, having covered seven thousand miles. They found the Mexican people always courteous and obliging, and April the best month to see the desert in bloom.

At the luncheon meeting May 16th, the noise of tongues and hammers may well be said to have been the theme of the meeting, but part of it had joyful portent. The manager of the restaurant explained that they were making an addition to the dining room, which the Geological Society will use.

As usual Mr. Carney came laden with specimens, not minerals this time, but some more of his series of fossils. One was a Nautilus from the Newport formation at Newport; a second was a Gastropod also from the Newport formation; and the third a crinoid which showed very well the five basal plates.

Dr. Thomas Thayer who has just returned to this part of the country from Washington, D.C., was a welcome guest. Having been gone since December he is now going to "hole up" in the John Day country where he hopes to find some more chrome.

Mr. Stevens proposed a social evening which is to be combined with the meeting of the Executive Board. This is going to be held at the home of Dr. and Mrs. Arthur Jones on Thursday May 23d.

Mr. Schminkey made a few remarks about the week-end trip to Cannon Beach. The trip is going to be a little harder than he originally realized for the beach in the region of Ecola Park has been much denuded of sand and now is covered with boulders. There is much in the way of interesting material to be seen. In fact, he hopes there are some professional geologists along so they can explain a lot of things to him.

He has also received another letter from Dr. Beck about the Grand Coulee trip, in which he asked the members of the Society to put on a program. Mr.Hancock made such a hit as the old Doctor that Dr. Beck would like to have the old gentleman return.

Mr. Stevens read the following letter from Mr. Chang:

To Members of the Geological Society of the Oregon Country,
Portland, Oregon. Attention J. C. Stevens, President.

Dear Sirs:

Allow me the honor to express my deep appreciation for all the courtesies and support which you have given me in connection with the Jade Exhibit in this city.

It is a great pleasure for me to meet you and I am grateful for the things which I have learned through this valuable acquaintance. It is only through such expressions of friendliness that we can have a richer knowledge of the mysteries of the Nature.

With best wishes for the future of your Society, I remain,

Sincerely yours,

Chang Wen Ti

REPORT OF THE SECRETARY

Year ending February 29,1940.

As of January 25, 1940, the Society had 122 memberships in good standing; of these, 51 were charter memberships, 68 were annual memberships, and 3 were junior memberships. Thus, there has been a net increase of 5 memberships during the year.

No report is submitted on the number and character of lecture meetings and field trips, on publications by the Society, or on the status of the Society treasury. All these, it is understood, will be reported separately by the appropriate chairmen of committees and by the Treasurer.

The Executive Committee has held three meetings thus far during the year.

Portland, Oregon
February 23, 1940

Norma Y. Piper,
Secretary

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Report of the Secretary on

LETTER BALLOT FOR OFFICES OF THE SOCIETY

in the year beginning March 1,1940

As provided in Article VI, Section 1, of the Constitution of the Society, there was sent to each member in good standing 45 days before this annual business meeting a letter ballot containing the names of the regular ticket of nominees for offices in the Society in the year boginning March 1, 1940.

Prior to this annual meeting, 42 marked ballots had been returned to the Secretary. All these are unanimous in favor of the regular ticket of nominees, as follows:

President:	J. C. Stevens
Vice President:	A. W. Hancock
Secretary:	Rose Jennings
Treasurer:	Helen Iverson
Director (3-year term ending February 28,1943	Clarence Phillips

Portland, Oregon
February 23, 1940

Norma Y. Piper,
Secretary

REPORT OF THE TREASURER

Cash Receipts: Year 1939-1940.

	Dues	News Letter	Banquet	Misc.	Total	Brot. Forward
1939						
Mar.1 Balance						393.54
	92.00	16.00	74.25	1.00	183.25	576.79
April	40.25				40.25	617.04
May	17.50				17.50	634.54
June	3.50				3.50	638.04
July	31.50	2.00			33.50	671.54
August	14.00				14.00	685.54
September	6.25				6.25	691.79
October						691.79
November	6.00				6.00	697.79
December	3.00	.25			3.25	701.04
1940						
January				1.05	1.05	702.09
February	204.00	.30	92.00	1.00	297.30	999.39
Totals	418.00	18.55	166.25	3.05	605.85	999.39

Cash Disbursements: Year 1939-1940.

	Multi-graph	Equip-ment	News Letter	Banquet	Staty. Prtg.& Postage	Lecture	Misc.
1939							
March	23.92		19.25	161.70			
April							
May			15.65				
June			13.74	40.20	1.48		
July			22.23				
August			10.23				
September			16.85		4.00		
October			49.85		3.85		3.04
November			7.80		1.15		5.00
December							1.57
1940							
January		33.00	7.70		1.54	3.45	6.25
February			40.57		1.05	20.00	5.43
Totals	23.92	33.00	203.87	201.90	13.07	23.45	21.29

Total Disbursements: $520.50

Mar.1 1939 Balance on hand	$393.54
Cash Receipts 1939-1940	605.85
	$999.39
Less Disbursements	520.50
Balance March 1, 1940	$478.89

REPORT OF THE TREASURER (continued)

TRIAL BALANCE - Before Closing, February 29, 1940.

DEBIT		CREDIT	
U. S. National Bank	478.89	Surplus 3-1-1939	660.62
News Letter Expense	203.87	News Letter-Sales & Subscriptions	18.55
Stat'y.-Postage & Prtg.	13.07	Banquet-Tickets 1939	74.25
Banquet Expense 1939	201.90	Banquet-Tickets 1940	92.00
Lecture Expense	23.45	Miscellaneous Receipts	3.05
Miscellaneous Expense	21.29	Dues, Memberships	418.00
Multigraph Equity	291.00		
Equipment	33.00		
	$1266.47		$1266.47

TRIAL BALANCE - After Closing, February 29, 1940.

DEBIT		CREDIT	
U. S. National Bank	478.89	Surplus Account	730.14
Multigraph Equity	218.25		
Equipment	33.00		
	$730.14		$730.14

****

RECONCILIATION OF BANK STATEMENT February 29, 1940

Balance per check book	$478.89	
Checks outstanding per list on bank statement	52.26	$531.15
Balance per bank statement	$527.65	
Feb.29 deposit not yet credited by bank	3.50	$531.15

Reports submitted by H. Mildred Stockwell

REPORT OF HISTORIAN for 1939.

A total of 90 pictures was given to the Society by members during the year, and all have been placed in the album, with credit given the donors.

There were 12 contributors. The largest number of pictures given by one person was 40, the donor being Mr. M. H. Calef. His pictures covered eight field trips.

Elizabeth M. Barr, Historian.

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REPORT OF THE PROGRAM COMMITTEE for the fiscal year 1939-40.

The by-laws of the Society state that its meetings shall be held at such times as fixed by the Executive Committee. That Committee has decreed that they shall be held on the 2nd and 4th Fridays of each month, thus requiring 24 meetings during the year.

In the past 12 months one meeting was cancelled on account of the regular date falling close to Christmas. Another meeting took the form of a picnic, and was arranged by a special committee. A third regular meeting date was taken for the annual banquet, which also was handled by a special committee.

Thus, 21 meeting dates remained to be filled by this committee. A list of these dates, showing the name of the speaker and the topic for each of them, is appended hereto.

Respectfully submitted:

Carl P. Richards, Chairman,

Program Committee.

LIST OF PROGRAMS PRESENTED DURING THE FISCAL YEAR 1939-40.

No.	Date	Speaker	Subject	Member	Non-member	Illustrated
1	Apr.14	Lt.W.M.Scaife	Maps and what underlies them.	.	*	*
2	Apr.28	Dr.J.C.Stevens	Silt and civilization	*		*
3	May 12	Mr.J.Martin Weber	Petroleum geology (motion picture)	*		*
4	May 26	Lt.Lancefield	Mapping with aerial photographs		*	*
5	June 2	Mr.H.G.Johnson	The World of the Moon		*	*
6	June 23	Dr.L.M.Gould	Ice-"the most interesting thing in the world"		*	*
7	July 14	Dr.Don B.Lawrence	Vegetation as a clue to recent geological events on Mt.St. Helens	*		*
8	July 28	Pres.A.M.Piper	Interpretation of Topographical Maps	*		*
	Aug.11	Annual Picnic	in Mt. Tabor Park			
9	Aug.25	Dr.Louis J.Wolf	A Surgeon with Peary in the Arctic		*	
10	Sept.8	Mr.Earl K.Nixon	Strategic War Minerals and Oregon Minerals	*		
11	Sept.22	Mr.Frank Kochis	Willamette River Basin Project		*	*
12	Oct.13	Mr.Alfred Monner	Central Oregon & Steens Mtn.		*	*
13	Oct.27	Dr.C.L.Booth	Hunting Fluorescence in Mexico	*		*
14	Nov.10	Mr.Fred G.Leasure	Geological Formations in Br.E. Africa		*	
15	Nov.24	Mr.F.W.Libbey	Gold in Oregon, with particular reference to dredging	*		*
16	Dec. 8	Mr.Thos.A.Carney	The Land of the Cliff Dwellers	*		*
	Dec.22	No meeting on	account proximity to Christmas			
17	Jan.12	Dr.Edwin T.Hodge	Geomorphology of European Battle-fields	*		*
18	Jan.26	Dr.A.H.Kunz	Chemical Aspects of Fluorescence in Minerals		*	*
19	Feb. 9	Dr.L.S.Cressman	Early Man in Oregon		*	*
20	Feb.23	A n n u a l	M e e t i n g - also : -			
		Mr.J.Martin Weber	(1) The Work of the Atmosphere (motion pictures			
			(2) Picturesque Guatemala (motion (pictures)	*		*
	Mar.8	A n n u a l	B a n q u e t			
21	Mar.22	Mr.Leslie L.Motz	The Role of the Assayer		*	*
				10	11	18

REPORT OF SERVICE COMMITTEE FOR YEAR 1939.

Publications delivered to members	$136.65
On hand to be delivered	1.30
Total at list price	137.95
Net Cost to Members	128.52
Savings: Amount	9.43
Percent	7.34%
Expenses, postage not paid by buyer	0.81

Thirty members used this service during the year. Publications were ordered principally from U.S.G.S. and G.S.A. where no discounts are given.

I again request that publications be ordered on some form of memorandum and if I am not immediately available when the idea strikes you for a certain publication, drop a postal card to 4204 NE Broadway. I feel sure that some orders have not been filled due to my failure to remember all verbal requests, or be able to report back if the publication is out of print.

Respectfully Submitted: Tracy Wade.

BUSINESS MANAGER AND EDITOR'S REPORT.

During the past year it has been our pleasure to present to the Society 24 issues of the News Letter. In these we have tried to publish those things we thought would be of interest to our members such as reports on trips and lectures. However, with the front page advertising Portland received last summer when it just missed having a meteor named after it, and again during the fall when we were visited by an earthquake, we have been giving the Society more news about meteors and earthquakes.

Members receiving their News Letters may note the officer and editorial staff, but you do not see the amount of detail work by those whose names do not appear there. And on behalf of the editorial staff we want to take this opportunity to thank them for their fine help and cooperation throughout the year.

Mrs. E.M.Barr is to be congratulated for the fine reports she has turned in on trips and lectures and help with typing; Mrs. Ruth Campbell for her work on the index and her assistance in typing; Miss Helen Brady and Miss Ada M. Henley for typing the Master copy for News Letter; Mrs. Gladys Baldwin for much typing; Mrs.Florence Richards for her work on the five-year index for News Letter; Mr. Carl Richards who early in the year was drafted as an Associate Editor; Mr. Fred Steeble, though not a member, for his cooperation in seeing that the Bulletin was printed on time; Mrs. Emily Moltzner for assembling and mailing the bulletins. A few other members have also helped with the typing, all of which has been appreciated.

About 60 volumes were bound during the year for members.

Raymond L. Baldwin

LIBRARY REPORT.

In our report made last year to the Society, we showed we had 36 books, magazines and bulletins in our library. We are glad to report this past year we have an addition of ninety books and bulletins. They will be given in detail in printed report in the News Letter.

Through our exchange agreement with American Museum of Natural History, they sent us 47 bulletins.

Department of Geology and Mineral Industries presented us with 14 bulletins.

Kenneth N. Phillips	9
Herbert Wallace	10
Dr. Lawrence	1
Geological Survey	3
Bound volumes of Geological News Letter	2

File of Ore.-Bin

Last year's publications of Mazama, with 1938-39 Annual.

W. R. Underwood, 1 book, 889 pages, "Geological Exploration of the 40th Parallel, vol.II Descriptive Geology".

Following up the recommendation we made last year when only a few books were in our Library, we strongly urge that a place should be provided in the business district of Portland where these books would be easily accessible to our members.

Raymond L. Baldwin.

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 12 PORTLAND, OREGON June 25, 1940

OFFICIAL PUBLICATION OF THE

GEOLOGICAL NEWS-LETTER
Official Publication of the
Geological Society of the Oregon Country
344 U.S. Court House, Portland, Ore.
POSTMASTER: Return Postage Guaranteed

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Executive Board

J. C. Stevens	President	434 NE Royal Court
A. W. Hancock	Vice-Pres.	2704 SE 84th Ave.
Miss Rose Jennings	Secretary	609 SW Lincoln St.
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Clarence D. Phillips,	Director	
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Associate Editors

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday June 20 — Members of the Society and their friends have a luncheon date at L'Abbe Restaurant!

Friday June 28 — Subject: DEATH VALLEY IN COLOR.
Speaker: Prof. J. H. Jonte, College of the Pacific, Stockton, Calif.
The colorful story of the geological history of Death Valley and its adjacent mountain ranges will be presented to us by one who has visited this area several times as leader of parties studying its geology. Prof. Jonte will illustrate his talk with excellent motion pictures, all in natural color. For those who have not seen the vivid hues of Death Valley, this is a good opportunity to obtain a true picture of them; and those who have visited that fascinating region should bring their friends to relive that experience with them, through the medium of Prof. Jonte's lecture.

Sunday June 30 — Badger Lake to Tygh Valley. This is another region new to our Society. Leave Front and Yamhill at 7:30 a.m. Reassemble at Government Camp at 9:00 a.m. Total mileage of trip 200 miles.
Leader; A. W. Hancock.

Thursday JULY 4 — No luncheon meeting.

July 4-7 — If enough members would like to visit the Cape Arago fossil beds, a trip can be arranged for these dates with Mr. A. D. Vance as the probable leader. This was the locality of the 1939 summer camp. Charleston, on Coos Bay, would be the headquarters of the group. Total mileage would be about 500 miles. If you desire to have this trip, be prepared to register at the meeting on June 28.

Thursday July 11 — Noon day luncheon at L'Abbe Restaurant.

Friday July 12 — OPEN DATE. This date is being held open for the present, in the hope that we may be able to arrange for an address by one of several eastern geologists who are expected to be in the west during July. If you have contact with such a possible speaker, notify the program committee or J. C. Stevens, at once.

Sunday July 14 — Details of this trip have not been fully outlined at this time. More information in our next bulletin.

Thursday July 18 — Noon day luncheon at L'Abbe Restaurant.

VACATION NOTES

We noted last Thursday Mr. Hancock was absent from noonday luncheon, and by means of the grape-vine we learned he was on vacation. Vacation for the Hancocks means fossil hunting in eastern Oregon.

Tracy Wade reminds the group that they are not to be alarmed when they do not see him in his usual place at the luncheon next Thursday. Mr. and Mrs. Wade are now vacationing in their cottage at the beach.

During the month of July your News Letter will be edited by Kenneth Phillips. All communications to Mr. Phillips should be addressed to him at 630 Postoffice Building, Glisan street, or at his home 2213 SE 52nd Avenue.

Ye Editor and Mrs. Baldwin expect to leave July 6th for a trip to Canada via Banff and Lake Louise.

At last our Library has a home where it will be accessible to our members. At a meeting of the Executive Committee held June 13, it was voted to purchase book-cases. These book cases have been purchased and are now in Mr. Arthur Piper's office 307 Old Postoffice Building, 6th & Morrison. On June 20, most of the books were placed in these cases.

Some time during the summer Mrs. Florence Richards will catalogue these books. However, any members of the Society wishing to take books from the library may do so by signing for such books as they may wish to use.

It goes without saying, that we are always glad to have donations of books dealing with geology or kindred subjects.

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SPHEROSIDERITE IN THE PORTLAND AREA.

Spherosiderite, according to Dana, is siderite that occurs as globular concretions, either solid or concentric scaly, with usually a fibrous structure. It is found in the vesicules of lavas, and has a silky sheen that is caused by its fibrous structure. Some of the concentric masses have an irridescent sheen.

Spherosiderite has been identified in the vesicular lavas along a new road up Tryon creek, in the NE¼ NW¼ sec.33, T.1 S., R.1 E., just west of the Boone's Ferry road, by Ray Treasher.

A microscopic study by John Eliot Allen reveals the internal structure as radiating fibrous, cut across by indistinct concentric spheres showing lines of growth. The mineral is light gray to pale brownish yellow, showing distinct absorption colors, stronger parallel to Z than to X. It is uniaxial negative, with extreme birefringence (around 0.2) the indices being determined as N_o = 1.8 plus and N_e = 1.63 ± .001.

This is the first reported occurrence of spherosiderite in Oregon. The mineral is found in the lavas of the Spokane area where it was first reported by Fernquist. Some very excellent specimens may be seen in the Tom Carney mineral collection.

- R. C. T.

DOODLE BUG TRIP.

Before leaving the usual starting place in front of the public market the doodle bug operated by Bruce Schminky was consulted and it said to go west, so we headed out Front Avenue down the lower Columbia River highway.

The first stop was on the site of the Lewis and Clarke fair on the Guilds Lake fill. Bruce Schminky led the discussion here and it was brought out that it was no accident that Portland outdistanced all its contemporary rivals and became the metropolis of the valley. The whole area between the river and the steep hills to the south, it was pointed out, was either lakes or swamps, making it undesirable for the site of a pioneer town. Only two low passes cut through the high steep hills skirting the river valley, one was later to be the site of the Canyon road and the other the modern Barbur Boulevard. In the early forties the principal farming area was the Tualatin valley and the opening of the Canyon road diverted the traffic from this area to Portland and gave it its first start on the road to becoming a city. It was also about one day's journey from Fort Vancouver and therefore a favorite overnight stopping place for boat travel from the fort to the upper Willamette valley. It was also the head of ocean navigation on the river and to add to its strategic location it was focal point for land travel from the east and to the south.

It was suggested that the steep slope of the hills to the south of the river might be due in part to faulting as well as to erosion. Schminky also called our attention the valleys which cut thru these hills to discharge their waters into the Willamette thru funnel or fan shaped valleys. At this point the police caught up with us. The prestige of the G.S.O.C. was saved, when Tommy James stepped over to the police car, identified us and explained that we were studying the history of the Willamette valley. The policeman withdrew to a strategic position, a gleam of suspicion still in his eye; and it was with a sigh of relief that the caravan was on its way with no arrests having been made.

The next stop was a mile farther on to the old county rock quarry where legal transgressors worked on compulsory assignments of geology. Apparently the work had not been carried out satisfactorily as it was difficult to determine whether or not the face of the cliff showed folding; however, there is a good example here of columnar basalt.

An argument arose here as to whether Schminky was not unduly influencing the action of the doodle bug but it was finally decided that the D.B. being an inanimate mechanism was above suspicion and a little later we turned left on the Newberry road a la Doodle. When we reached the Skyline drive we had an exceptional view of the Tualatin valley. The party stopped at a road cut to note the metamorphic process of the changing of the basalt to clay thru the action of weathering and soil acids. A good example of conchoidal fracturing was pointed out by Mr. Stevens. It was brought out that this process had been going on long before the surface was exposed by the road cut. Mr. Schminky was giving us what should have been an enlightening bit of information, but in mentioning the mineral apatite, he failed to spell it, and was misunderstood. Lunch was eaten. A few drops of rain fell but not enough to dampen either our ardor or our larder.

Back to the Lower Columbia River highway and stopped at the Wildwood Golf Course where the fossil beds in the hills back of the course were pointed out. It was also brought out by Mr. Schminky that the salt spring on the back of the golf course was once the source of a thriving industry in the early days of the country. A salt

factory was established here and turned out at one time seven or eight hundred pounds of a superior grade of salt a day in the late sixties. Later on with the advent of better transportation facilities salt could be shipped in from the outside cheaper than it could be produced locally so the industry went into an eclipse.

Three miles farther on we stopped at another abandoned rock quarry, Rocky Point, to see the few remaining chips from an opalized log which had been shipped in cold storage by erratic express from the Horse Heaven Hills.

From here the doodle bug said straight ahead so we went through Scappoose and when the D.B. said "left" we turned up the hill and revisited the Columbia County iron mine which was included in the itinerary of the January 1939 caravan. Since our visit the assay will doubtless have to be lowered. On the return trip we stopped at the new tunnel on the Barnes road which was carefully inspected and approved generally. The caravan was officially disbanded at Mt.Calvary cemetery.

The trip was much enjoyed by five cherubs and seventeen adults.

- Mrs. Mildred P. James,
Doodle Bug Trip, April 14, 1940.

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The following quotation is taken from Part 5, Bulletin 4, Boulder Canyon Project, Final Reports entitled "Stress Studies for Boulder Dam", pages 25-6:

"Studies of the settlement of the reservoir bed due to the great weight of stored water, more than 41 billion tons, showed that the elastic deformation of the earth's surface may amount to as much as 0.5 of a foot at the dam, and to as much as 0.8 of a foot in the center of the lake. These deformations probably will be gradually increased in the future, due to flow of the surface crust and the flow of the material in the interior of the earth beneath the reservoir. During the next few centuries, flow effects, combined with elastic deformations, may produce a total settlement of as much as 2 feet at the dam and as much as 3 feet in the center of the lake. Precise level lines, run in the spring of 1939 when the reservoir surface was about 70 feet below the top of the dam, showed that a total settlement of about 0.88 feet had occurred at the dam up to that time, thus indicating that flow effects, as well as elastic deformations, were appreciable during the initial filling of the reservoir."

The above interesting article was furnished by Ray Mackenzie.

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In the librarian's annual report which was given in our last bulletin, he showed over 90 publications had been added during the past year to our library. As a matter of record, we are giving in this issue a complete list of the titles and their donors.

THE FOLLOWING ADDITIONS HAVE BEEN MADE TO OUR LIBRARY DURING 1939:

From American Museum of Natural History:

ADDITIONS TO THE PUERCO FAUNA, LOWER PALEOCENE
By GEORGE GAYLORD SIMPSON

ADDITIONS TO THE UPPER PALEOCENE FAUNA OF THE CRAZY MOUNTAIN FIELD
By GEORGE GAYLORD SIMPSON

A GIANT OXYAENID FROM THE UPPER EOCENE OF MONGOLIA
BY WALTER GRANGER

A GATUN OSTRACODE FAUNA FROM CATIVA, PANAMA
By H. N. CORYELL & SUZANNE FIELDS.

A LARGE TENTACULITES FROM THE SHRIVER FOUNDATION (ORISKANY) OF PENNSYLVANIA
By H. E. VOKES.

ANYNODON MONGOLIENSIS FROM THE UPPER EOCENE OF MONGOLIA
By HENRY FAIRFIELD OSBORN

AN ANCIENT ENSUCHIAN CROCODILE FROM PATAGONIA
By GEORGE GAYLORD SIMPSON

AN EARLY PLEISTOCENE FAUNA FROM NEBRASKA
By EDWIN H. BARBOUR & C. BERTRAND SCHULTZ

A NEW FAUNA FROM THE FORT UNION OF MONTANA
By GEORGE GAYLORD SIMPSON

A NEW JURASSIC MAMMAL
By GEORGE GAYLORD SIMPSON

A NEW MARSUPIAL FROM THE EOCENE OF PATAGONIA
By GEORGE GAYLORD SIMPSON

A NEW PRIMATE FROM THE UPPER EOCENE PONDANG FOUNDATION OF BURMA
By EDWIN H. COBLERT

A PLEISTOCENE FLORA FROM FAIRBANKS,ALASKA.
By RALPH W. CHANEY & HERBERT MASON

A SPECIMEN OF THE UPPER CRETACEOUS MULTITUBERCULATE MENISCOCSSUS
By GEORGE GAYLORD SIMPSON

A STUDY OF THE OSTRACODA FAUNA OF THE WALDRON SHALE,FLAT ROCK CREEK, ST. PAUL, IND.
By H. N. CORYELL & MARJORIE WILLIAMSON

CATALOGUE OF THE METEORITES IN THE AMERICAN MUSEUM OF NATURAL HISTORY AS OF OCT. 1, 1935.
By CHESTER A. REEDS, P.H.D.

CENSUS OF PALEOCENE MAMMALS
By GEORGE GAYLORD SIMPSON

COOPERIA TOTADENTATA, A REMARKABLE RHINOCEROS FROM THE EOCENE OF MONGOLIA
by HORACE ELMER WOOD, 2nd.

CROSSOCHELYS, EOCENE HORNED TURTLE FROM PATAGONIA
By GEORGE GAYLORD SIMPSON

EOCENE MOLLUSCA FROM THE SUBATHU GROUP (LUTETRAN) SIMLA HILLS STATE, INDIA
By H. E. VOKES.

FOSSIL MAMMALS FROM BURMA IN THE AMERICAN MUSEUM OF NATURAL HISTORY
By EDWIN H. COLBERT

FOSSIL PLANTS FROM THE UPPER CRETACEOUS AGUJA FORMATION OF TEXAS
by ERLING DORF

FURTHER NOTES ON THE GIGANTIC EXTINCT RHINOCEROS, BALUCHITHERIUM, FROM THE OLIGOCENE OF MONGOLIA by WALTER GRANGER & WILLIAM K. GREGORY

GEOMYID RODENTS FROM THE MIDDLE TERTIARY
By ALBERT ELMER WOOD

MORE COMPLETE REMAINS OF A CHELONIAN, SYLLOMUS CRISPATUR COBE, FROM THE MIOCENE OF VIRGINIA by CHARLES T. BERRY

NEW FISHES FROM THE CONTINENTAL TERTIARY OF ALASKA
By ERICH M. SCHLACKZER

NEW REPTILES FROM THE EOCENE OF SOUTH AMERICA
By GEORGE GAYLORD SIMPSON

NOTES ON THE CLARK FORM, UPPER PALEOCENE, FAUNA
By GEORGE GAYLORD SIMPSON

ON SPERMATODUS PUSTULOSUS COPE, A COELACANTH FROM THE "PERMAIN" OF TEXAS
By STANLEY WESTOLL, BSc., Ph.D.

ON THE PALATE, OCCIPUT AND HIND FOOT OF BAURIA CYNOPS, BROOM.
By R. BROOM, F.R.S.

OSTEOGRAPHY OF THE EAR REGION IN MONOTREMES
By GEORGE GAYLORD SIMPSON

PALAEOTRAGUS IN THE TUNG GUR FORMATION OF MONGOLIA
By EDWIN H. COLBERT

SIWALIK ANTELOPES AND OXEN IN THE AMERICAN MUSEUM OF NATURAL HISTORY
By GUY E. PILGRIM

SKELETAL REMAINS AND RESTORATION OF EOCENE ENTELONYCHIA FROM PATAGONIA
By GEORGE GAYLORD SIMPSON

SKULL STRUCTURE OF THE MULTITUBERCULATA
By GEORGE GAYLORD SIMPSON

SOME FEATURES OF THE CRANIAL MORPHOLOGY OF THE TAPINOCEPHALID DEINOCEPHALIANS
By LIEUWE D. BOONSTRA

SOME HAMILTON OSTRACODES FROM ARKONA, ONTARIO
by H. N. CONYELL & DORIS S. MALKIN

SOME MINERAL INCRUSTATIONS SELECTIVE UPON CRYSTAL FORMS
By CLIFFORD FRONDEL

STRUCTURE OF A PRIMITIVE NOTOUNGULATE CRANIUM
by GEORGE GAYLORD SIMPSON

TERTIARY DEER DISCOVERED BY THE AMERICAN MUSEUM ASIATIC EXPEDITION
By EDWIN H. COLBERT

THE CRANIAL MORPHIOLOGY OF SOME TITANOSUCHID DEINOCEPHALIANS
By LIEUWE D. BOONSTRA

THE CRICETID RODENTS DESCRIBED BY LEIDY & COPE, FROM THE TERTIARY OF NORTH AMERICA
by ALBERT ELMER WOOD

THE FAUNA OF THE SUNCHAL (OR MARGOS VERDES) FORMATION NORTHERN ARGENTINA
By T. D. COCKERELL

THE MORPHOLOGY OF WARDITE
By FREDERICK H. POUGH

THE SKELETON OF STYRACOSAURUS WITH THE DESCRIPTION OF A NEW SPECIES
By BARNUM BROWN & ERICH M. SCHLAIKJER

TWISTED CRYSTALS OF PYRITE AND SMOKY QUARTZ
By CLIFFORD FRONDEL

TWO NEW RODENTS FROM THE MIOCENE OF MONGOLIA
By ALBERT ELMER WOOD

UPPER MIOCENE MOLLUSCA FROM SPRINGVALE, TRINIDAD, BRITISH WEST INDIES.
By H. E. VOKES.

From U. S. Geological Survey:

GEOLOGY AND GROUND WATER RESOURCES OF THE ISLAND OF OAHU, HAWAII
By H. T. STEARNS AND K. N. VAKSOCK

GEOLOGIC MAP AND GUIDE OF OAHU, HAWAII
By H. T. STEARNS

STRUCTURAL MATERIALS IN PARTS OF OREGON AND WASHINGTON
By N. H. DARTON: U.S. GEOLOGICAL SURVEY BULLETIN NO. 387

GEOLOGY & WARER RESOURCES OF THE MIDDLE DESCHUTES RIVER BASIN, OREGON
By HAROLD T. STEARNS: U.S.GEOLOGICAL SURVEY WATER SUPPLY PAPER 637-D.

From Dr. D. B. Lawrence:

SOME FEATURES OF THE VEGEATION OF THE COLUMBIA RIVER GORGE WITH SPECIAL REFERENCE TO ASSYMMETRY IN FOREST TREES,
By D. B. LAWRENCE

From K. N. Phillips:

A COMPLETE REPORT IN 8 BULLETINS OF TRANSACTION OF THE AMERICAN GEOPHYSICAL UNION 15th ANNUAL MEETING (1934). THESE REPORTS ARE DIVIDED AS FOLLOWS:

Part 1 - in 7 bulletins
1. General Assembly
2. Section in Geodesy
3. Section on Seismology
4. " " Meteorology
5. " " Terrestrial Magnetism and Electricity
6. " " Oceanography
7. " " Volcanology.

Part 2 - 1 volume.
Section on Hydrology and The Western Interstate Snow Survey Conference

From H. W. Wallace - 2529 NE 59th Ave.

U. S. GEOLOGICAL SURVEY 22nd Annual Report 1900-1901.
Part 1. Directors Report and a paper on Asphalt & Bituminous Rocks
Part 3. Coal Deposits, Oil and Cement
Part 4. Hydrography.

THE MINERAL RESOURCES OF OREGON
Vol.1 - 5 - 6 - 7- 8.
Vol.2 - 2 - 4
Vol.3 - 1

From Mrs. Robert Leigh:

GEOLOGICAL SKETCH , by Lambert Wood.

From Oregon State Department of Geology and Mineral Industries:

Bulletin No.	Publication
1	MINING LAWS OF OREGON, 1937, with 1939 Addenda.
2	PROGRESS REPORT ON COOS BAY COAL FIELD: F. W. Libbey.
5	GEOLOGICAL REPORT ON PART OF THE CLARNO BASIN: Donald K. Mackay
7	THE GEM MINERALS OF OREGON: H. C. Dake
8	FEASIBILITY OF A STEEL PLANT IN THE LOWER COLUMBIA AREA NEAR PORTLAND, OREGON: R. M. Miller
9	CHROMITE DEPOSITS IN OREGON: John Eliot Allen
10	PLACER MINING ON THE ROGUE RIVER, OREGON, IN RELATION TO FISH AND FISHING IN THAT STREAM: Henry Baldwin Ward
11	GEOLOGY & MINERAL RESOURCES OF LANE COUNTY, OREGON: Warren D. Smit
13	FIRST BIENNIAL REPORT OF STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES, 1937-1938.
14-A	OREGON METAL MINES HANDBOOK: NORTHEASTERN OREGON, EAST HALF: by the Staff.
15	GEOLOGY OF THE SALEM HILLS AND NORTH SANTIAM RIVER BASIN,OREGON: Thomas P. Thayer.
18	FIRST AID TO FOSSILS, OR WHAT TO DO BEFORE THE PALEONTOLOGIST COMES: John Eliot Allen
19	DREDGING OF FARMLAND IN OREGON: F. W. Libbey
G.M.I.Short Papers:	
1	PRELIMINARY REPORT UPON OREGON SALINE LAKES: O. F. STafford
2	INDUSTRIAL ALUMINUM: A BRIEF SURVEY: Leslie L. Motz
MISCELLANEOUS PUBLICATIONS:	
	SAMPLING OF SMALL PROSPECTS AND NEW DISCOVERIES.

Ruedemann, Rudolf

FOSSIL EVIDENCE OF THE EXISTENCE OF A PACIFIC OCEAN IN EARLY ORDOVICIAN TIME
Geological Society of America, Bulletin no.39, page 299-300, 1928.

None of the Paleozoic fossils have a more cosmopolitan character than the graptolites. The same common species are found in Australia, China, Europe and America and in the same succession - a fact that has been generally accepted as due to the pelagic habitat of the graptolites, which are planktonic or pseudoplanktonic in habit, and also has been taken to prove the free interoceanic passage of ocean currents. As is well known, the same world-wide distribution of certain graptolites has also made them most valuable guide fossils for intercontinental correlations.

It was the late Dr. J. S. Hall, of Melbourne, Australia, a very active student of graptolites, who first pointed out certain provincial characters of the Australian graptolite faunas that set them apart from the British graptolite faunas with which they had before been identified. Also, the present writer believed (1904) that he saw in certain peculiarities of the New York and eastern Canadian faunas of Beekmantown age indications of a possible connection with the Pacific realm, as shown especially in the presence of the Australian genus Goniagraptus, in the Deep Kill shale.

The study of graptolite faunas of Beekmantown age from British Columbia (Glenogle shale, Windermere Creek), collected by Mr. Walker, and from the Hailey Quadrangle in Idaho (collected by Dr. Kirk for the United States Geological Survey), has shown that these graptolite faunas contain a very distinct Australian element, not only in the species which will require closer study, but even in the presence of genera that hitherto were known only from Australia, and that represent a distinctly aberrant type of development. These are the genera Oncograptus T. S. Hall and Cardiograptus Harris from the Castlemaine district, in Victoria.

Professors Hall and Harris have pointed out that these two genera are probably derived from the cosmopolitan species Didymograptus caduceus - a form with broad, semi-elliptic branches or stipes and the same thecal characteristics as the two genera. Professor Harris (1916) considers them as late derivatives of D. caduceus, with a very limited vertical range. In Australia they are restricted to the lower and middle Darrimil beds, or to graptolite horizons corresponding to those of the third Deep Kill division, that with Diplograptus dentatus. In British Columbia and Idaho they appear already in the zone of Didymograptus walcottorum, which corresponds to the second Deep Kill zone. They are, therefore, here somewhat older than in Australia and possibly nearer their metropolis of origin.

The fact that we wish to emphasize in this connection is that the two genera, and other species to be dealt with in a later publication, suggest a provincial character for the ocean, with which the Ordovician sea of the late Beekmantown or early Chazy time of British Columbia and Idaho on one side and the sea covering Victoria on the other side were connected. The occurrence of the genera in both eastern Australia and western America at approximately the same time indicates further an open oceanic connection for

these pelagic organisms between the two regions, or, in other words, an ocean over the southern and middle portions of the present Pacific Ocean.

It may be added that this is fully in accordance with other evidence furnished by paleogeographic studies of the Paleozoic strata of western America, which, as Schuchert's and Ulrich's well known paleogeographic charts show, lead persistently to the assumption of a large oceanic basin in the west, whence new invasions with new faunas, evolved along the coasts of that ocean, took place at almost rhythmical intervals. These western Pacific faunas often penetrated deep into the continent. They are, however, always littoral faunas that have wandered only along coastlines, while the graptolites furnish an element of the oceanic faunas that, being of pelagic habitat, may have come across the whole ocean or around its margin with the oceanic currents, independent of the coastline.

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GEOLOGICAL NEWS LETTER

VOL. 6 NO. 13 PORTLAND, OREGON July 10, 1940

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News-Letter issued semi-monthly on the 10th and 25th.

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

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do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

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Telephone Number Occupation

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_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday July 11. SPECIAL NOTICE. Noonday luncheon at THE ORANGE LANTERN. Mark the place. 4th floor Central Bldg., 10th Ave. between Alder and Washington.

Friday July 12 Subject: A NATION IN COLOR.
Speaker: Jas. L. Loder, Salem, Oregon.

Those who have seen Mr. Loder's colored movies of Oregon highways will agree that the cliffs, waterfalls, and flowers put on their best dress for his camera. Mr. Loder has recently returned from a motor trip across United States, taking colored movies en route; these will be shown for the first time to our SOciety. There is space here only to mention the highlights: Niagara Falls in winter dress; the Painted Desert; Navajo Indian Reservation; Cactus in bloom; Yellowstone National Park; Death Valley; a storm at Grand Canyon; Boulder Dam; Zion and Bryce Canyons. For instructive entertainment, this travelogue will live in your memory. Bring your friends and the folks next door.

Sunday July 14 A visit to Oak Grove Cinnabar Mines. Leave Front and Yamhill at 7:30 a.m. Total mileage approximately 130 miles, with about 2 miles of walking. There will be several points of interest to observe before arriving at Estacada. Lunch at Rippling Springs Forest Camp. In the afternoon the mining district will be of especial interest because of the cinnabar in calcite which is found there. There will be observations of the hydrothermal alteration of the basalt. Petrified trees along the route will also be of interest to many. Leader: H. B. Wood.

Thursday July 18 Noonday luncheon at the ORANGE LANTERN. Don't forget that this is for members and their friends.

Thursday July 25 Noonday luncheon at the ORANGE LANTERN.

Friday July 26 A lecture meeting will be held; speaker and subject to be announced later through the News-Letter, the press, and the luncheon meetings.

Sunday July 28 Details of this trip have not been organized at this time. More information to follow.

Friday Aug.9 Presumably the date of the annual picnic at Mt.Tabor Park. More information and plans will follow in the next bulletin.

CIVIC SERVICE

On June 27th, the Geological Society of the Oregon Country presented to the city of Portland a bronze plaque for the seven-ton basalt boulder at the City Hall, whereon are the inscriptions of an ancient people who used to live in the Wallula region. In a later issue a complete account of this prehistoric petroglyph will be presented. Mr. J. C. Stevens, president of the Society, made the presentation, while Mayor Joseph K. Carson accepted the gift. Pictures of the plaque and the presentation act, along with an editorial, appeared in the Oregonian for Sunday, June 30th.

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NEWS NOTES.

The last issue of the News-Letter was not cognizant of the many irons Kenneth Phillips had in the fire! - hence the editorship for the month of July by Louis E. Oberson. All communications to Mr. Oberson should be addressed to his home at 2906 NE Tillamook - or call Garfield 6397.

****

CHANGE OF ADDRESS

Earl W. Minar 3666 SE Woodstock Ave., Portland, Oregon.

CHANGE OF NAME AND ADDRESS

Elma Abrahamson to Mrs. Thomas Eistrat, 1614 McKinley Blvd., South Bend, Indiana.

****

All who viewed the large and valuable exhibition of jade which was shown recently in Portland on its way to the Golden Gate Exhibition, doubtless had their interest awakened in this fascinating and beautiful mineral, but geologically-minded ones probably found themselves asking, "What is jade?"

There is such an element of oriental mysticism about this gem which fascinates one in his approach, either to the substance itself, or even to the mere subject of it, that some are apt to regard jade as being a fabrication wrought from Chinese sorcery. But others will not be satisfied until the aura of mystery is dispelled, and they are in possession of the scientific and economic facts.

To such the article in this issue by our loyal member, Thomas A. Carney, will be most welcome. It is a crisp purview of the subject and, though it gives the facts and statistics, it does not destroy, but rather adds to, the romance and charm which the mention of jade always suggests.

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GRAND COULEE SYMPOSIUM

by Mrs. E.M.Barr

Anticipating the trip to Grand Coulee by members of the Geological Society of the Oregon Country, the Society's regular meeting on May 24 was devoted to that region. Talks were made by Dr. E. T. Hodge, C. P. Holdredge, and John E. Allen. Dr. Hodge was the main speaker. He discussed problems relating to the Grand Coulee question, and as usual made blackboard drawings to illustrate.

He pointed out the high Cascade range, and the mountains of Idaho, which extend north and coalesce with the complex system of high mountains to the north. Swinging across to the south are three groups of ranges, the Frenchman hills, Yakima hills and the Horse Heaven hills. The Columbia river flows southwest. The Frenchman hills continue westward until they come into and pass under the Cascades. To the eastward they are broken by a gash and end out in the desert. The Columbia river, flowing southward, goes right through, and on southwestward to another range and cuts through a second time, right straight through. It goes on southward to the Yakima hills where the same thing happens. The break through is not wide, but is just wide enough for the river to get through, and a highway, which an eminent engineer was able to put through. When you get down to the Horse Heaven hills, said Dr. Hodge, it would seem that the river will certainly go right through there. You follow the river to these hills and expect it to do the same thing as before, but it doesn't. It swings over to the Wallula Gateway, and goes through a pass so narrow that only a river could find its way. Later, a railroad was built through the pass, and finally a highway was put through.

"The ridges are anticlinal folds. Rocks that used to lie flat have been folded up. Those folds not only are bent up, but they dip eastward. The elevation is about 2,200 feet, and the land, basalt, from there drops to the south and to the north. There are really four anticlinal folds across the country.

"A peculiar thing about this region is the fact that, swinging southward across this country are hundreds of valleys that obviously were once occupied by streams. These valleys go almost north and south. The Columbia river does not do that. Its turns follow nature. The streams that are now dry, flowed from north to south and crossed, as the Columbia river does, those buried ridges, and cleft them. These channels divided and kept on dividing. They are all old river channels that cut down through the overlying silts, down into and upon basalt. Not only do the channels cut through these silts, they cut into the basalt down below, and also swing out, leaving mesas on the basalt floor. And, swinging out, they cut deeper perhaps than they did in their first valleys. In some places the silt has been taken off altogether, leaving a little mesa surrounded entirely by basalt. A stream leaves a perfectly good valley, swings off into some other valley, then cuts back, back and forth into the other valley and strips off the silts, in some places cutting shallow, and in other places cutting deep and into the basalt. Not only that, but as it flows over the surface of this basalt, looking at the stream in cross-section, it leaves chunks of basalt up in the air. These were named scablands by someone with an air of authority, and have been called that ever since.

"Another thing of great interest in this region is a deep hole, a lake, located in a veritable bad lands, which should be visited. You drive along the road, the surface is absolutely flat, except for some irregularities. Suddenly you come to a hole. You look down this deep hole, and it is certainly pleasing to see a beautiful

blue lake, surrounded by green fields. In trying to solve the geological problem of the stream that fed the lake and the rim, one notes that there is no outlet. The walls are sheer on all sides, 300 feet high. There is a breach on one side, where there is a sort of landslide, and the road goes down there. On the other side is a similar breach where the road comes out, each road very steep. There is a hole in the ground, surrounded by sheer walls, 300 feet high. Not an old volcano, it is all basalt on the bottom. The grass is green, growing on thin soil, 3 inches thick. You can see the basalt under the water in the lake. This is one of many holes, but it is the biggest one and should be visited.

Dr. Hodge drew a map of the Columbia river gorge at Grand Coulee. Explaining this, he said: "The Columbia river here has very steep walls extending on to the east. On the other side the walls are equally steep. There are a few benches on it, down low. On this side (east) there is a break, there is a valley that extends 40 miles. The bottom of this valley is 500 feet above the river, hung up there. If it were not for some silts that the river carried down at a later date and filled the valley partly, silts that the river has cut away to a very large extent so that they form benches now, it would be quite a job to get up into the Grand Coulee. Those are the silts that caused so much trouble in the building of the Grand Coulee dam. I might say incidentally, that the Grand Coulee dam is located where the hanging valley comes into the Columbia gorge. That dam will create a lake which will cross the Canadian border. The power that will be created will be sufficient to pump the Columbia river up into that hanging valley. Then the river will store water in a great reservoir in the Grand Coulee, and that water will be taken out across the country to irrigate the land. Standing up above this deep canyon of the Columbia, 500 feet, there is a canyon plenty big enough to hold the whole river. In places the upper canyon is 5 miles wide, and that canyon is 40 miles long, and having gotten through this valley, which I call the Telford-Chenery divide, it comes out on a level surface. The valley is about 40 miles wide on top. It goes over to Chenery and even farther, cuts right through to Quincy. Moses Coulee is just like Grand Coulee.

"There are at least two other things that should be explained. If you have seen the magnificent work the Chamber of Commerce of the state of Washington did some years ago, settling the country and building houses and barns, and compare as you travel through and see these skeleton houses now, long since abandoned, you wonder what they put their crops on, as you can see the basalt. You travel over that for miles and miles. That is the country which is to be irrigated. Then you turn westward to the Columbia river and you get out beyond the soils. You get out on the gravel, waterworn gravel, usually brickbat basalts that have been nicely rounded. You come to a canyon, and you drop down to this canyon, to the Trinidad Springs, or Frenchman Springs. They are enormous springs. They come gushing right out of the rock, from basalt gravel on top of the basalt. A river of some magnitude must have cut this canyon, a river that flowed from east to west into the Columbia river canyon, and having cut that canyon, filled with gravel. That country is underlain with gravel not cemented. All the water that runs over that country, runs over loessial soil and goes scooting down into the Columbia river.

"There is another curious thing about this whole country that I observed in that region. Here and there is a valley cut in the high hills, a fairly deep valley. Streams flowing down a valley carry everything down the valley, and when they come to a flat surface, they are very apt to build an alluvial fan. You do not find that here. You find something that requires special explanation. You find, choking that valley, a pile of alluvium which slopes upstream. In a good many places a stream

has cut through, but it slopes up the valley. At the mouth of the Deschutes, and at the mouth of every tributary of the Columbia as far up as you want to go, you look at the gravel and see that not only is there a pile of gravel at the mouth, but that it slopes up upstream. You see where the river has cut through the torrential bedding and that it slopes upstream. All the rivers in those days flowed backwards. At Mosier, in Mosier creek, you find a fine example of torrential bedding pointing backward. THere is a law in geology that in attempting to explain the past, you explain it in terms of the present. Streams in the past did the same thing that they do today. In the Grand Coulee country that law of nature does not hold. Things are not explained in terms of the present. The streams flowed backward when the scablands were being made."

Referring to a drawing of a big canyon cut in basalt, Dr. Hodge said: "This canyon was at one time filled with silts, and still is up to a certain level. This can be the Snake river, or it can be the Columbia. Here's a bench. Water always flows from the end of a bench down to the river. That isn't what happens here. The bench is high at the edge and slopes back. It might be called a levee. It is not a levee, because how could a stream, having built a levee to this high elevation, cut down as this river has? Along the Snake river and the Columbia, there is a ridge adjacent to the canyon that slopes back so much that sometimes streams trying to cut in from the side are unable to do so, and sometimes make a pond and dry up on the bench.

"One more thing that needs to be explained. All over this country up to various elevations, there are great big boulders. Geologists call them erratics. Some are very large and some are so small that you have to find them with a screen. We call them all erratics because they are not normal rocks of the region. They are foreigners. When Prof. Thomas Condon first found them in the Willamette valley, he thought they may have come from the Cascades. Diller also thought this. We searched the Cascades but could find none like them. We only find them all over this country. They are everywhere, and they are foreigners from a foreign land. They came largely from Canada, but some of them came from northern Washington, and have been spread all over this scabland region.

"These are some of the things I know you will see on this Grand Coulee trip, and if you do not really find the answer to them in the course of this evening, and in the course of your trip, you might read a paper entitled "Some moraine-like deposits near Arlington" (written by Dr. Hodge) "which I think is the key to the whole thing."

John Allen followed Dr. Hodge's talk with an explanation of J. Harlan Bretz' theory regarding the scablands. He told that Dr. Bretz saw all these things and then said we cannot explain them, that the streams we see today couldn't perform in that manner. Dr. Bretz wrote five or six papers describing the things Dr. Hodge pointed out, and arrived at the conclusion that there was a great flood originating somewhere north. Later, he said that probably a dam in the SPokane river had broken loose and flooded this whole country, washed off all the soil, and built up great bars. He thought that the Grand Coulee was caused by a diversion of the Columbia river by ice. Morainal deposits might have diverted the river and caused the Grand Coulee itself and the tremendous falls that are four times the size of Niagara in its width, and twice its height. The ancient Columbia river was as we see it today, but supplemented by these outpourings of water from this tremendous ice shield.

Mr. Claire Holdredge spoke briefly, stating that he had never visited the Grand Coulee, but had read up on the literature of the country. One was the description by J. Harlan Bretz of the Grand Coulee and some other features of that part of the Columbia basin. He was very much impressed by Bretz' departure from uniformatarianism. He said: "As I began to roam over this country, to the Wallula Gateway, to the Walla Walla valley, to the Yakima valley, and even to the Frenchman Hills, I saw more and more signs as Bretz has described it. With his idea of this flood in mind, I was intrigued by the evidence of this flood.

"One of the things I have seen that impressed me most is the Wallula Gateway, where the Columbia river cuts through the Horse Heaven Hills structure. To me that is the most impressive of all the gaps that cut through the anticlines in the whole Columbia basin. Just north of the Wallula Gateway are two things. The first of them is the deposits in the Walla Walla valley. The Walla Walla river rises in the Blue Mountains in Oregon and flows into the Columbia just west of the Wallula Gateway. Both of those valleys are wide and long valleys, and sloping back of the valleys are these deposits. The Walla Walla river has cut through these deposits and left mesas. On top of one mesa is a channel which went down to the Walla Walla river, or one of its tributaries, and developed a falls which cut upstream. An excavation was made here at one time, and there were 35 separate beds exposed. The bottom bed was thickest, about 8 feet thick, composed of about 4 feet of basalt sand, very angular, very fresh, nothing mixed with it, except now and then an erratic boulder. Above that was 18 inches of silt, then repetition, and on top a bed about 12 inches thick, a portion of which was basalt grit, a portion silt, and containing a great many foreign boulders. The bedding pointed away from the Columbia river. The Yakima valley presents very similar evidence.

"I don't think these peculiar features which are seen in the Columbia basin can be seen anywhere else in the world. They are controversial and every geologist in the world hopes some day to see them. It is perhaps a greater geological phenomena than Crater Lake or the Carlsbad Caverns." Mr. Holdredge asked those making the trip to Grand Coulee to look for faceted pebbles as they traveled over the scablands. He said he has found them as far north along the Columbia river as Vantage.

Mr. Stevens, president, called on Mr. Allen to speak a second time, to give the Flint theory on the scablands region. That, said Mr. Allen, proposes a dam 1,150 feet high at the Bridge of the Gods, producing a lake which probably extended up the Walla Walla river and up the Snake river. Into that lake these waste waters from the glaciers were coming down and depositing a great deal of material, filling up the lake. This whole area was filled up to about 1,100 feet. Then the dam broke, and the streams began to cut down into this tremendous accumulation of alluvium, and today have eliminated all of it, except some bars in the Quincy basin and the Pasco basin. Flint explained some features which could not be explained very well by one single tremendous flood.

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"So little is known of the things that we know so little of."
T.A.C.

JADE

by Thomas A. Carney

It is only in the flowery language of the Chinese that jade fittingly can be described. When we write the word j-a-d-e, the mind thinks of a stone of certain colors and appearance, that is all. When the Chinese reads his character yü , a vast field of imagination is open to him. Even the most casual synologue translates it as the stone possessing the cardinal virtues, - pure, precious, valuable, and beautiful. This, however, is much too blunt an expression of what Yü conjures up before the Chinese scholar.

As China gave the use of jade to the world in its treasured and abundant forms, so it has transmitted from high antiquity the most fanatical and revered adulation ever bestowed by man upon any of nature's gifts. One can readily see why, after having had the pleasure of viewing the exhibition of jade brought here a short time ago. This exhibit still leaves our memories fresh with the beauty and the loveliness of the things which we were shown. There is one dominating piece in the beautiful array of jade which stands out very vividly in our minds. This was the large jade pagoda, the second treasure of China. One is neither a purist in etymology nor in chemical science when the statement is flatly made that there is no such substance as jade, there is nephrite and jadeite. Nephrite to the mineralogist is a silicate of calcium and magnesium; jadeite is a silicate of sodium and alumina. In addition, there are found small quantities of ferrous oxide in nephrite, and in jadeite ferric oxide and potash. Nephrite is a variety of amphibole, like asbestos and hornblende; in contrast jadeite is a member of the pyroxene group, like diopside, augite, wollastonite, spodumene, and others in that group. The green color that you see in jadeite is caused by the presence of chromium.

The colors in nephrite are caused by the impregnation of iron in different amounts. The coloring in both jadeite and nephrite is so numerous that it makes an inexhaustible subject which I cannot go into here. To the majority of people you speak of jade, and they think of one color, green. This, of course, is far from true. Our English expression - all the colors of the rainbow - is entirely too meager for the coloration of nephrite and jadeite.

The Burma jade takes on the white, brownish, and reddish white. The predominating color, of course, is green; foremost is the emerald or imperial green, the rarest forms having a color as deep as emerald, but not so transparent nor quite so translucent. The Turkestan jades take on the reds, browns, blacks, grays, mottled greens, and also the mutton-fat white. You will notice that I have only mentioned two names for locations, Lower Burma and Turkestan, China. You might be interested to know that there is no jade mined in China. There are records showing that jade was worked in the province of Kansu three thousand years before Christ, but the fact remains today that jade is not mined inChina except for a small amount in the province of Yunnan.

The Turkestan jade is mined in the southern part of Chinese Turkestan, at the foot of the Kun Lun mountains. Khotan is the principal city of the jade business, and it is here where the caravans are made up to start the long journey to the city of Peiping.

The jade is placed on the backs of camels, each camel carrying about four hundred pounds, then the camel caravan starts on its two thousand mile journey. The route taken is through southern Turkestan, at the foot of the Kun Lun Mountains on the imperial road until they reach Lanchow. Leaving Lanchow, the caravan moves north by the Great Wall of China on the jade route until Kneihua is reached, there the jade is transported by trains on its two days' journey to Peiping. There it is transported on camels across the city of Peiping to the different lapidary shops on jade street and here it is studied for days or even weeks before being carved into some object of beauty. The Burma jade is mined in Upper Burma, the mines being located in the Kochin Hills. The three principal places being Tamaw, Hweka, and Mamon. Tamaw is a plateau three thousand feet high. The jade in this location occurs in serpentine. Shafts are sunk into the ground and underground workings are connected. The fire process of cracking the rock is the common method. In the rainy season the miners stop working because the shafts become flooded and must be bailed out before operations are resumed. The period for working is limited to about three months, March, April, and May. At Hweka jadeite occurs as boulders on the slopes of the hills. The season here is longer than at Tamaw. At Mamon the jadeite is found as boulders in the alluvial deposits of the Uru River, also in the river bed itself. Jadeite from this area is shipped to Canton and Shanghai, some finding its way to Peiping to compete with the Turkestan nephrite. White jade of the first quality, after its long haul from central Asia, brings about forty dollars a pound. Jade from Burma will bring about sixty dollars a pound. This, of course, must not be confused with the better quality of green, which will fetch as much as three hundred dollars an ounce.

A visit to Jade Street in Peiping with its jade shops ranged down either side of a street about a city block in length, is a thing that would always stand out in your memory. In about one hour's walk through this street in and out of the shops you will have seen about fifty to sixty thousand pieces of jade, and that would have been in every color imaginable, also in all shapes and sizes. Of course, that does not mean that Jade Street is the only place to buy jade. There are jade dealers scattered all over the city in the different market places, but Jade Street being known the world over is the reason for mention here. In a smaller way the same profusion of jade is found in Shanghai; due to the factories and export business Shanghai is called the world's largest jade market. The foreigner usually makes his purchase in the normal way of asking the price and then haggling over the bargain. Not so the dealers, in selling to each other they do their trading by pressure of the hands clasped in each others' sleeves. Not a word is spoken so that onlookers are unaware of the price agreed upon.

You will be amazed at the crude methods used by the carvers, but these methods have been used through the generations and no doubt will be used for years to come. In starting the work on a large boulder, the sawing is done by three men by means of a steel wire pulled back and forth by two of the men while the other wets the cut occasionally with a mixture of water and abrasive. By this slow method days are required to cut the large blocks. After the block is cut, a design is copied on the stone, and here the artist works for days using his imagination and creative ability for the delicate work of the finished article. Dark spots will be utilized for the eyes of animals, using the varying colors for trees and flowers, and a particular light spot might be used for a background or the vase proper. When the actual carving is being done the design is sometimes changed and made to fit the colors that show up below the surface.

The first rough work, such as drilling holes and removing the cores, usually is done by apprentices. The hole is drilled by the use of a bow with the string

encircled about it using the same watery abrasive. Unlike ourselves, speed is never considered. The same method is used today for shaping as was used in the remote centuries of the pre-Christian era. In these workshops there are no buzzing motors, foot power alone is used. Except for the metal discs, the bench is crudely made of wood. The carver by his foot treadles keeps the discs turning, but never in a complete revolution. The worker stops every few minutes to observe his work and applies the wet yellow sand which is held against the disc and the stone with his hand. Various size steel discs are used in the process of carving, ranging from twelve inches in diameter to others so small that they could pass as small drills. The jade is passed from one man to another, each man working with a different size disc, each man staying at his own bench. The heavier objects are suspended in the air from a string tied to a pole above. This enables a carver to touch his work lightly to the cutting disc without having to support its weight. It is interesting to note that the fine polishing that is done on this stone which is too hard to scratch with a knife, is done by a small wheel made of soft wood from the gourd, the largest not being more than one inch, the small ones down to a quarter of an inch in diameter. These gourds last about eight or nine days before being worn away. In the meantime with the aid of yellow earth, which is found in China, and last with a mixture of wax and gum, the finished polish is achieved. Some of the shops use ruby powder, but usually just the three substances described. Except for the modern abrasives used in sawing, the other materials cost very little, and the whole equipment could be thrown together by an unskilled mechanic for a few dollars. It is with these very crude methods that some of the old men carve these very delicate pieces that we look at with amazement; even knowing as we do of their methods, we wonder how they can accomplish the intricate working of this entrancing art. It is easy to understand then why the Chinese set their high estimation of jade above all other gem stones, and it is in China that we find the use of jade not only extending back into the past, but furnishing us with the means of tracing through the countless examples of both ancient and modern objects the development of an interesting expression of the art of jade carving.

It could be said here that no one material other than jade could let us turn back the pages of time and allow us to read of a culture that was old when our own was struggling to emerge out of barbarism. I would like to give credit to my friend, Mr. Chang-Wen-Ti, for a part of this information. Mr. Chang, as you will remember, was in charge of the jade exhibit which is now at the San Francisco Fair, and the man responsible for that astounding piece of workmanship,"The Jade Pagoda". Even as you stand and gaze at it, it seems unbelievable that man could carve such a delicate piece of work from a rough stone which, without a doubt, can truly be said was the artistic endeavor of geniuses.

This modern pagoda is four feet two inches high and thirteen inches at the base. Although it weighs seventy-five pounds, it was cut from a mass of Burmese jadeite weighing eighteen hundred pounds and was eight feet by four feet by two feet. The value of the pagoda is estimated to be $1,000,000 in U.S. currency. When the stone was taken from the earth, its fine green colors forecast the fitting use to which it was put. A famous artist was employed to make the design, which he did only after visiting various parts of China to study the best of the ancient pagodas. The two selected as models were the historic structures at Lunghua near Shanghai and at Soochow. Measurements for its seven stories were entrusted to a veteran Peiping carver under whose direction one hundred and fifty of the best jade carvers were set to work. Windows, balconies, and sloping roofs with their delicate wind bells were wrought with minute attention to architectural detail. After ten years the pagoda was finished, and the delicate carving of this work of sheer beauty was taken out for the world to enjoy. From this same block was carved the arch, miniature standard

lamps, and a sundial. These are all replicas of marble originals which adorn the forbidden city of Peiping, and they furnish a touch of reality to the pagoda terraces as they rise in three tiers for the pagoda to stand on.

Much can be written and said of the beauty and intricate work, not to mention its half a million hours of back-breaking and eye-strain labor that was put into the carving of this piece of jade, which is a fine illustration of the fact that China still retains its reverence for the stone over which she still maintains the mastery of carving. And so you stand there with this thing of entrancing beauty that the Creator has enhanced man to create. You find it hard to take yourself away, and you stand in quiescence gazing at this wonder work of man, "The Jade Pagoda."

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I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday July 11 — Remember our interesting Thursday noon luncheons at our new location, THE ORANGE LANTERN, 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday July 25 — Mr. and Mrs. A. W. Hancock invite the members of the Society and their friends to see the mastodon skull which he recently unearthed, and to inspect his museum collection in the dinosaur den of his basement. The footprints lead to the famous den. Drive out Division Street to 84th, turn right to 2704 SE 84th Ave. In order to view the mastodon skull and other attractions in the yard, it is necessary to be there before dark - 7 o'clock is fine.

Sunday July 28 — SALEM AND EOLA HILLS TRIP.
Leave SW Front Avenue and Yamhill St at 7:30 a.m. Leave State Street in Salem at 9:00 a.m. McMinnville, Mt.Angel, Salem and Stayton topographic maps cover the trip. Bulletin 15, Geology of the Salem Hills, may be had from the State Department of Geology & Mineral Industries, 65¢ list.
Leader: Franklin L. Davis.

Thursday Aug. 1 — Remember this luncheon as it is the time when friends meet to talk and pass around interesting geological specimens. The location is The Orange Lantern.

Thursday Aug. 8 — Noonday luncheon at The Orange Lantern.

Friday Aug. 9 — This is the date of our annual picnic at Mt.Tabor Park. Bring your dinner and meet at the Crater at 6:30 p.m. An amusing program is planned, and each member should come prepared to join in the fun!

August 30 Sept. 2 — CRATER LAKE TRIP
This trip promises to be one of the best trips of this year. John E. Allen, who has been a naturalist at Crater Lake National Park, will be the leader. Details of this trip will be given later.

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THURSDAY HIGHLIGHTS

At each Thursday noonday luncheon something of interest tfanspires. Herein is a record of the luncheons of July 18 and July 25.

July 18: Mr. O. E. Stanley spoke of his trip to Alaska.
Dr. Richard Foster Flint, Sr., professor of geology at Yale University, was introduced by Mr. F. W. Libbey.

Dr. and Mrs. W. T. Heron were introduced by Miss Rose Jennings. Dr. Heron is teaching at the Extension Center of the Oregon System of Higher Education.

Leo Simon told of the interesting Fourth of July trip that the Simon family took to Prineville, Redmond, Bend, Century Drive, Odell Lake, and Holley. His description of the justice of the peace at Holley entertained the group.

Specimens were passed around by Mr. F. W. Libbey, Leo Simon, and Mr. A. D. Vance.

July 25th: Dr. Lloyd Staples, University of Oregon, consulting geologist of the Horse Heaven Mercury Mines, told of his experiences at the mines.

Dr. and Mrs. Don Lawrence of the University of Minnesota were introduced by Mr. Kenneth Phillips. Dr. Lawrence told of his study of plant life on Mount St. Helens.

Dr. William S. Cooper told of his studies of plant life in sand dune environments along the Columbia River and the Pacific Coast.

Mr. Earl Campbell, Director of Safety for Portland, Oregon, was introduced by Mr. A. D. Vance.

Dr. Courtland L. Booth gave a few of the highlights of his six weeks' trip East. His experiences at the Republican National Convention were especially interesting. His "doodle bug" found many fluorescent rocks at Franklin, New Jersey.

Mr. O. E. Stanley passed around some of his pictures taken on his recent Alaskan trip..

A card was read by Mr. A. W. Hancock from Mr. and Mrs. Raymond L. Baldwin.

Franklin L. Davis told of the Salem trip which is to be held on July 28. Mr. A. W. Reeves will be one of the co-leaders. The Society is glad to have its Salem members with us occasionally.

Dr. and Mrs. Edwin E. Osgood became the proud parents of a daughter, Brenda Gay, on July 17, at the Emmanuel Hospital.

Constance Endres was married to Roy C. Swanson at St. Ignatius' Church on the afternoon of July 15. Florence and Helen Iverson were Connie's attendants. Emma Nordgren served at the reception.

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CHANGE OF NAME AND ADDRESS

Constance Endres to Mrs. Roy C. Swanson, 1102 N. Cambrian, Bremerton, Wash.

Dr. and Mrs. Arthur C. Jones again demonstrated their fine and generous hospitality as hosts to members of the Geological Society of the Oregon Country Thursday evening, May 23d. The event was to honor a bride-elect, Miss Constance Endres; a recent bride, Mrs. Lloyd L. Ruff; and Mr. and Mrs. Earl K. Nixon, who were planning to leave for Peru for an indefinite stay.

The informal program, announced by the president, Dr. J. C. Stevens, began with the singing of two of the Society's own songs, without which no social gathering of this organization would be complete. The guests of honor were introduced, and Miss Endres, Mrs. Ruff, and Mrs. Nixon were each presented with a large bouquet of flowers. Mr. Nixon spoke briefly of his experiences during his recent trip to Peru. Miss Helen Iverson told of a vacation trip made a few weeks before by the "Three Musketeers" to Mexico City. A letter from Mrs. Ray C. Treasher, now living at Grants Pass, was read. She sent greetings and expressed regret that she and Mr. Treasher could not be present.

Pictures taken by Mr. O. E. Stanley in Mexico and shown on a screen where an important feature of the program. Mrs. Stanley explained each picture in turn as it appeared. In addition to the Mexicon scenes, some beautiful colored flower pictures, made in Portland, were shown. Following these, an amusing skit was presented by Miss Emma Nordgren and Miss Rose Jennings, in Mexican dress. Miss Nordgren, as Sandino Concarni, wore a large sombrero and serape, and Miss Jennings, as the wife, Carmelita, was resplendant in a senora's lace mantilla. The sombrero and a stirrup and bit used by "Sandino" were purchased in Mexico by the J. Dean Butler family while on a visit to that country two years ago.

Assisting with the refreshments were Mrs. Dwight Henderson, who poured the coffee, Mrs. R. L Baldwin, who served the cake, and Miss Grace Poppleton, Each square of the white iced cake was surmounted by a geologist's pick in red. Flowers used about the house, mostly peonies, were furnished by Dr. H. C. Cooper from his garden. One large bouquet of spring flowers was presented for the occasion by Mrs. Ben Smith, also an enthusiastic gardener.

The fact has been called to mind that this date, May 23d, was the fifth anniversary of the Society's official Bulletin, The Geological News-Letter. The first issue, no.1, was dated May 23, 1935. Russell R. Norton was editor and manager, assisted by Harry L. Clark, Margaret DAnks, Charles J. Emerick, Eleanor Hann, and Lillian Neff. The first paragraph in this first bulletin is titled "Across the Editor's Desk". It is reproduced here as being of interest at this time:

"This publication is the first effort of the society to develop and maintain a news medium, dealing with club activities and facts allied with it for its members. It is as yet in an embryonic stage and does not even possess a name of its own. Members are invited to suggest names for the consideration of the executive committee. You have a name, our society has a name, let's find one for our paper".

- E. M. B.

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DEATH VALLEY NATIONAL MONUMENT

by J. H. Jonte'

Death Valley National Monument, located in southeastern California and Nevada, has an area of 2,981 square miles. Death Valley itself occupies a trough between the Panamint Mountains on the west and the Grapevine, Funeral, and Black Mountains on the east. The trough is approximately 140 miles long and 16 miles wide at its widest point. Of this area, 550 square miles lie below sea level. Death Valley is an area of contrasting elevations. Telescope Peak, in the Panamint Range, has an elevation of 11,325 feet above sea level. Bad Water, the lowest point in the valley, is 279.6 feet below sea level. No other place in the United States shows such great relief in such a small area.

The average rainfall is 1.4 inches. A period of 435 consecutive days without measurable precipitation is recorded. The record also shows one year with 351 clear days. A maximum shade air temperature of 134 degrees Fahrenheit has been observed. A higher temperature under similar conditions has been recorded in northern Africa, where 136 degrees Fahrenheit was reached.

All of the known geologic forces, with the possible exception of glaciation, have had a part in the formation of the region. All of the major divisions of geologic time are represented by rocks in the Death Valley region. If the formations were restored to the sequence in which they were originally deposited, a thickness of approximately 40,000 feet would be had. The Archean is represented by schists, gneisses, and quartzites in the Black Mountains on the east side of the valley, and near its southern end. At places the vertical exposure is as much as 5,000 feet.

The Algonkian series rests unconformably upon the Archean, and consists of quartzites, schists, and limestones. The rocks of this series are highly colored and present a banded appearance. Volcanic members of the series are now greenstones, with associated bands of talc on the contacts. The Paleozoic formations lie uncomformably upon the earlier rocks. All divisions of the Paleozoic are found at various places in the valley, but at no place is the complete column found. Rocks representing this division are found on both sides of the valley. Fossils found and identified include: Cambrian trilobites, Ordovician gastropods, Silurian and Devonian coral, and Carboniferous crinoids.

The Mesozoic is represented by intrusions of granite and other intrusives in the Panamint Range on the west side of the valley. Sediments of Mesozoic age are also found on the Panamint side of the valley.

Intense crustal movements are indicated as having occurred at the close of the Mesozoic era, since the Tertiary rocks were laid down on the upturned and beveled edges of the earlier formations. The Tertiary beds are more nearly horizontal than any of the earlier formations, and are composed of both volcanic and sedimentary series. The volcanics consist of lavas; rhyolite, andesite, and basalt, also tuff and ash. The sedimentaries are limestone, shale, sandstone, and conglomerate. The shale was formed as at the present time, in a lake basin; the sandstone and conglomerate in alluvial fans. The shore lines and extent of the Tertiary deposition basin are not known. Dante's View, 5,700 feet above sea level, a peak in the Black Mountains on the east side of the Valley, is a huge mass of Tertiary rhyolite resting upon Archean gneiss.

Tertiary fossils have been discovered in sandstone, determined to be Oligocene, in the Grapevine Mountains on the east side of the valley, near the north end. These fossils include a Titanotherium, an animal somewhat related to the modern rhinoceros, a small horse, and rodents. Other Tertiary fossils, such as gastropods, fish, and wood, have been found, but definite age has not been determined.

The Quaternary is represented by alluvial fans on both sides of the valley, and the clay and salt deposits on the valley floor. The fans on the west, or Panamint side of the valley, extend up the mountainside as much as 2,000 feet above the floor, whereas on the east side of the valley the fans are much smaller, in many cases being mere dumps of boulders at the canyon mouths. This difference is due to the fact that the east valley wall is a very recent fault scarp with steep slope. Fault scarps are found across alluvial fans on both east and west sides of the valley, indicating that crustal movement has taken place quite recently, and may still be going on.

The floor of the southern half of the valley is composed of salt and clay deposits. A well drilled in the southern part of the valley showed alternated beds of salt and clay without reaching bedrock. Old shorelines found on the southwest side of the valley indicate a lake approximately 100 miles long and 600 feet deep.

Quaternary fossils consist of footprints in sandstone found on the west side of the valley, in the north-central part. These prints include those made by camels, horses, elk, antelopes and wading birds.

An area of approximately 50 square miles in the northwest part of the Valley is covered by sand dunes.

Death Valley has much more abundant life than is generally thought. It is on the salt beds and alkaline flats in the southern part of the valley where nothing grows. More than 560 species of native plants are known in the Death Valley watershed. Gorgeous coverings of wild flowers occur in spring, especially when rainfall has been ample and properly distributed. The desert sunflower was most prolific in March 1940. Eleven species of cactus are known in the valley. The desert holly does especially well here. Many varieties of salt resistant plants are known. One known as Salt Bush measured 26 inches high but had root which was laid bare by the wind blowing away the soil to a depth of 14 feet. At this point, one of the roots, five-eighths of an inch in diameter, was still penetrating to farther depths.

Animal life is represented largely by mammals, birds, lizards, coyotes, foxes, ground squirrels, big horn sheep, burros, kangaroo rats, and other rodents. Small lizards, horned toads, and the larger puff lizards, or Chuckawallas, are frequently seen. Snakes are rarely, if ever, found on the valley floor. Approximately 160 species of birds have been observed below the sea level line. Most of these are migratory, but 14 species make their home on the valley floor.

One very interesting bit of animal life is that of a relic fish, a carp, which once lived in the prehistoric lake which occupied this region. These tiny fish, one inch in length, locally known as desert sardines, or hell carp, are Cyprinodo macularius. They are found in Salt creek, a stream in one of the alluvial fans on the Panamint side of the valley. This stream, which seldom is more than five

miles in length, has been cut off from the lake for more than 25,000 years, according to estimates. During this time the fish have adapted themselves from a fresh water habitat to one of warm salt water.

Industrially, Death Valley is important because of the borax deposits. The first plant to be erected was the old Eagle Borax works in the south end of the valley in 1880. The undertaking was not successful. The following year F. M. (Borax) Smith built the Harmony Borax works in the central part of the valley, to work the Ulexite - "cotton ball"- deposits on the floor of the valley. Later deposits of Colemanite were discovered in Tertiary deposits in the Black mountains on the east wall of Death Valley. These workings are not being operated at the present time, due to deposits of Kernite near Kramer, on the Mojave Desert. Deposits of Selenite (gypsum) and Celestite are known in the Tertiary formations on the east side of the valley. A deposit of lead carbonate, found in the Paleozoic formations on the west side of the valley, has been worked, as also have the talc deposits nearby. Near Leadfield, in the northeast part of the valley, some beautiful stalagmites and stalactites of lead carbonate have been found. Gold and silver have been produced in unverified amounts by mines in the Panamint mountains. Panamint City was a very lively camp during the 1870's. There are more "lost" mines than producers in this area.

Death Valley is the best watered area of the entire Mojave Desert region.

(Note: The above resume' by Prof. Jonte' covers the more important points of the geological history of Death Valley National Monument, as presented by Mr. Jonte' on June 28, 1940. Those who were fortunate enough to attend that meeting will long remember the beautiful coloring of his unusually fine motion pictures, as well as his fascinating word picture of the activities of student groups in visiting that region. The Society is grateful to Prof. Jonte' for his lecture and for this resume'. - Ed.)

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Across the country and back in ten days by automobile, visiting the Southwest's most scenic spots, and with a splendid moving picture record of the trip was the accomplishment of Mr. James L. Loder, of Salem, last April. The Geological Society of the Oregon Country was the first organization privileged to view this remarkable collection of pictures in color on Friday evening, July 12. Mr. Loder is a member of the firm of Loder Bros., automobile dealers, in Salem. In the ten days of his trip, the first leg of which was a business trip, Mr. Loder experienced all kinds of weather, from winter to summer, and traveled from America's lowest point, in Death Valley, to an elevation of 9,105 feet at Rainbow Point in Bryce Canyon. He stated that at Bryce the colors are beyond description but are very difficult to photograph. Mr. Loder was a very entertaining speaker, and his pictures thrilled the large audience. His trip covered 5,292 miles and he filmed 1,500 feet of colored pictures.

Mr. Loder started his pictorial trip at Oregon's historic Champoeg, then to the state capitol in Salem, showing spring flowers and shrubs, both wild and cultivated, in the Portland and Salem districts, before going east to Chicago. He made a side trip to Niagara Falls, where he took pictures of the falls in winter dress. Returning westward, he visited and filmed in color, some of the most interesting features of the Painted Desert, petrified forest in Arizona, the cactus area, Grand Canyon, Bryce Canyon and Zion, also Boulder dam. He also included cloud effects,

sunrises and sunsets. Following this, Mr. Loder showed a series of pictures taken on a trip to Yellowstone Park, through the Jackson Hole country, with some close-ups of the Teton Mountains. He promised to visit the Society again with some more pictures.

- E. M. Barr

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DIAMONDS FROM THE SKY.

Diamonds actually fall from the sky. That real diamonds actually exist in meteorites has just been demonstrated for the first time by X-ray examination of hard, black crystals in a specimen from the celebrated meteor crater in Arizona. This shows that they have the appropriate X-ray pattern and the correct index of refraction.

Inclusion of diamonds in "shooting stars" has been reported at least twice before but has not been verified. It was strongly suspected in another specimen from the Meteor Crater region recovered many years ago. Part of the original now is in the Smithsonian Institution collection. The evidence was that in cutting this specimen the saw struck highly resistant material that had the appropriate diamond hardness, and specks in the cut surface looked like black diamonds. Diamonds - upon much the same evidence - were reported in the Nova Urei meteorite, seen to fall in 1886 near the Alatyr River in Russia. This specimen is now at Leningrad.

The present specimen was obtained this year by the Smithsonian Institution and some of the suspected diamond inclusions were ground out. They were turned over to mineralogists of the Geophysical Laboratory of the Carnegie Institution of Washington for study by the most refined methods, with the result that the true nature of the inclusions no longer is in doubt. The conditions under which meteorites probably were formed would be favorable for the formation of diamonds, provided the requisite carbon was there in the first place.

Demonstration that the inclusions actually are diamonds recalls the futile efforts made to drill into the Meteor Crater in the hope that a big diamond mass would be encountered. After drilling straight downward for about 1,200 feet the drills struck a resistant material through which they could not penetrate. Efforts to sink a shaft were defeated by striking water. Geophysical experiments indicated a very heavy mass in the neighborhood. None of this, of course, would be accepted by geologists as positive evidence of the existence of a large diamond mass. There is even some question as to whether the "shooting star" responsible for forming the Meteor Crater actually penetrated the earth at all. It may simply have exploded and its fragments scattered over the neighborhood where many of them have been picked up in the past century.

The diamonds in the Smithsonian Institution are not of gem quality. They are very good black diamonds - even more valuable than medium-rate gems because of their use in industry. A graphite inclusion in the specimen is exceptionally rich in them. Part of the Russian specimen is reported to be about one percent diamond.

- Smithsonian Institution

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LOG OF FIELD TRIP ON JULY 28, 1940, TO ENVIRONS OF SALEM, OREGON

Co-leaders: Glen Paxson
Wm. Reeves
F. L. Davis
Lloyd Ruff

The trip to Salem on July 28th is of interest both to the paleontologist and to the student of stratigraphy. The fossil exposures are Oligocene and are considered the finest in the locality. Particular study will be made of the stratigraphy and the Willamette Water Gap, also Holmes Gap, both of which will be visited.

A number of erratics will be examined and their origin discussed. A short stop will be made at the country home of Mr. and Mrs. F. L. Davis in Eola, where talks will be given on the trip. Literature recommended for study is:

Thayer's Geology of the Salem Hills
Allison's pamphlet on Erratics.

Be sure to have a sheet of the Salem quadrangle. Beware of poison oak. Trip will run 141 miles.

Time:		Mileage:
7:30 a.m.	Leave Portland, foot of SW Yamhill St. Trip from Portland should not be made in caravan owing to traffic.	0.0
9:00 a.m.	Arrive Salem, State and Capital Sts.	52.0
9:15 a.m.	Leave Salem, proceeding west on State to Commercial and south on Commercial to Miller, then follow pavement	52.0
9:30 a.m.	Finger Sta. Parking here with care, walk a short distance on Ore. Elec. right-of-way. Fine Oligocene fossils	58.0
10:30 a.m.	Leave Finger Sta. Proceed southward on highway to "Snug Harbor".	
10:45 a.m.	Arrive "Snug Harbor". Park cars on area adjoining road and proceed to island in Willamette river, about 1/8 mile	58.5
1:00 p.m.	Here is found a good exposure of Oligocene. Lunch at this place. Leave Snug Harbor, returning to Salem, stopping at comfort stations in Marion Square.	
1:15 p.m.	Arrive Marion Square.	65.0
1:25 p.m.	Leave Marion Square, proceeding south on Water St. one block to Center St., thence west across Willamette River, thence West Salem on Dallas Highway, to Eola to home of Mr. & Mrs. Davis. Will be here short time for a talk.	69.5
2:00 p.m.	Arrive Kingwood road, turn right up the hill, leaving Dallas road.	74.0
2:10 p.m.	Stop at intersection of Kingwood road and Cascade Drive to inspect erratics.	74.1
2:15 p.m.	Proceed onward up Kingwood Rd. to top of hill; turn right. Stop to study view at	74.2
2:20 p.m.	Proceed onward on Kingwood Rd. to Glen Creek road. Turn left on Glen Creek road.	74.5
2:25 p.m.	Park cars carefully and inspect erratics in brush.	
2:30 p.m.	Arrive at intersection; turn right.	75.1

Time:		Mileage:
2:35 p.m.	Arrive Chaplin Corners.	75.8
2:35 p.m.	Turn right at intersection on Popcorn School road.	76.9
2:35 p.m.	Arrive Popcorn School (note holly orchard). Keep to right	78.1
2:40 p.m.	Turn left at intersection	78.6
2:45 p.m.	Turn right at intersection	79.0
2:50 p.m.	Arrive at Rattlesnake Hill for study of strange arrangement of rocks suggesting possible prehistoric construction Walk 1000 ft.	79.3
3:30 p.m.	Leave Rattlesnake Hill	79.3
3:40 p.m.	Turn right at intersection	81.1
3:45 p.m.	Straight ahead at intersection	81.9
3:50 p.m.	Turn right on to U.S. Pacific Highway	84.6
3:55 p.m.	Arrive Holmes Gap. Park to study formation.	86.9
4:15 p.m.	Leave for Portland via Holmes Gap and McMinnville (distance 53.5 miles)	
5:30 p.m.	Arrive Portland	140.4

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WOLF CREEK HIGHWAY TRIP, MARCH 17, 1940.

Francis T. Jones.

The caravan assembled at the Pacific University campus in Forest Grove at 9:30 under cloudless skies. Although the trip had not been announced at a regular meeting or in the News-Letter, ten cars had assembled for the trip and two more joined at Sunset Camp. From Forest Grove we proceeded without stops via Banks, Manning, and Buxton, to the railway trestle at top-hill, where the first stop was made.

The Society has visited this location once or twice on previous trips but some of the members present had not done so, and even those who had were glad to collect again from a familiar location. The cuts along the railway yielded fossils for everyone although not without effort since it was necessary to climb the hill and hammer the concretions energetically in order to persuade them to disclose their secrets. Fortunately the rails of the railroad track facilitated the concretion-cracking process.

A few good crab specimens were found and many clam-type shells, of which most were the Nemocardium Weaveri. Dentalia were common but difficult to obtain except in fragments. Some gastropods were also found, the common common being Natica.

These fossils were all of Oligocene age and correlate with fossils found in sediments all over the Vernonia area and as far as the Tualatin Valley floor.

The caravan proceeded (after making sure that no one was lost in the brush while returning by short-cut to the highway) and made its next stop about 4 miles north of Sunset Camp on the Vernonia-Timber road. At this point a high bank at the side of the road exposed more Oligocene sediments which were profusely peppered with large concretions. Considerable energy was expended in satisfying our curiosity concerning the nature of their contents but most of them were disappointing. A few gastropods and pelecypods were found here, also some carbonized wood fragments.

This was the only place on this trip where specimens of the pelecypod Thysira Bisector Conrad were found, although on previous trips they had been found in the first big cut west of Sunset Camp on the Wolf Creek highway. The two locations are almost the same elevation and only three or four miles apart.

Since some of our party were beginning to show signs of "noon-attacks" we hurried on the remaining few miles to Sunset Camp where, with the kind permission of the overseer, we ate our lunch, sitting on the logs which had been hauled in for firewood. The large round sections of these logs made excellent tables when laid down flat. Before long everyone was feeling fine as a result of the plentiful nourishment, the warm air, and the bright sunshine. Three of the girls, Ellen James, Lotus, and Calypso Simon, having pretty well devoured the contents of a big box labeled "Lunch for Leo", felt so frisky that they couldn't refrain from pestering some of the other picnicers by marking crosses, question marks, and other heiroglyphics on their backs with chalk. Even after being sat on and having their chalk confiscated, their spirits were unquenched.

The debris having been collected we climbed into the cars and drove east on the new section of the Wolf Creek highway to the first cut about a quarter of a mile from the junction at Sunset Camp. Here we observed some rotten gravel horizontally overlying some older marine sediments which had been slightly folded and faulted. In the anastomosing joint cracks calcium carbonate had been deposited in some places, and pieces an eighth an inch thick or less were collected. The broken edges of these pieces showed a fibrous texture similar to that of satin spar, though of finer grain.

The strata on the high south side of this cut slope toward the cut and much water seeps out of the bank. As a consequence some large slides have dumped material into the road. Probably this cut will continue to give trouble. Although few fossils were found here, those few were very interesting because most of them were small crabs of a type never found in this vicinity before. They were about the same shape as present day crabs but the carapace was only the size of a quarter or smaller. Several specimens with legs were found. Most of these crabs were given to A.D.Vance for comparison with specimens in his collection and possible identification. Some small, sharp-pointed gastropods were also found here. About two miles farther east we came to the end of the road and here we found in the bank two sand dikes cutting across the marine sediments. The sand is fairly fine and consists mostly of sharp quartz grains which are not cemented together, at least not in the surface material. After examining this structure, Mr.Ruff explained to the group some of the possible ways in which sand dikes might be formed; he also gave us a resume' of the geology of the area we had been studying, pointing out that in Oligocene time a fairly shallow sea had covered all of this part of Oregon as far south as Eugene (where similar marine fossils have been found. Subsequently the sediments were folded and elevated to form the Coast Range, perhaps in Miocene time. Some volcanic activity accompanied the formation of the mountains; the intrusives of basalt are now used as sources of rock to construct the highway. The group next walked to the new fill and cut a few hundred yards beyond, picking the large chunks of fill material to pieces in eager quest of fossils. This location provided abundant specimens, and since the rock breaks easily everyone collected dozens of fossils. The most common fossils found here were the pelecypods: Nemocardium Weaveri, Acila, Natica, Leda, and Macoma. Gastropods were fairly common and several types of highly decorated shells were found, including Epitonium Condoni. A few crabs were found and one large 5-inch shell which appears to be a limpet. Mr. Ruff. carefully dug the limpet out and will attempt to identify it.

After spending most of the afternoon at this location, we reluctantly departed with our booty at about four o'clock, returning by way of Timber. We made one more stop about a mile southwest of Timber to collect a few more fossils at a location previously visited. No new types were discovered. At this stop, Mr. A. D. Vance identified specimens for the group and gave some pertinent suggestions as to the desirability of accurately recording the location where any specimen was collected. He also recommended that amateur collectors take their specimens to some geologist for identification and that they report any new discovery.

We disbanded at this stop to return home, feeling that we had had a pleasant and profitable trip.

Leaders: Prof. Jesse R. Watson
Prof. Francis T. Jones
Pacific University, Forest Grove, Ore.

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GEOLOGICAL NEWS LETTER

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DATES TO MARK ON YOUR CALENDAR

Thursday Aug.8 — Remember our interesting Thursday noon luncheons at our new location, THE ORANGE LANTERN, 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Aug.9 — This is the date of our annual picnic at Mt. Tabor Park. Bring your dinner and meet at the Crater at 6:30 p.m. An amusing program is planned, and each member should come prepared to join in the fun!

Sunday Aug.11 — Trip along Evergreen Highway in vicinity of Kelso and Longview. We remember Mr. Hancock found some water agates in the hills, and he may have some more hid down there. Watch daily papers for further details.

Thursday Aug.15 — Noonday luncheon at the ORANGE LANTERN.

Friday Aug.23 — Dr. Max Demorest, Research Fellow- Yale University, who has been engaged this summer in a study of crystalline structure of ice and snow on Mount Rainier, will tell us about some of his findings.

Sunday Aug.25 — Huckleberry trip to Squaw Mountain.

Aug.30 Sept.2 — CRATER LAKE TRIP
This trip promises to be one of the best trips of this year. John E. Allen, who has been a naturalist at Crater Lake National Park, will be the leader. Details of this trip will be given later.

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THURSDAY HIGHLIGHTS.

At each Thursday noonday luncheon something of interest transpires. Herein is a record of the luncheon July 25th:

Dr. C. L. Booth passed around many interesting specimens collected on his recent trip East.

Mr. A. D. Vance passed around a sample of obsidian from Idaho.

Mr. A. W. Hancock started a specimen of calcite cinnabar around the table.

Dr. W. T. Herron passed around a carboniferous specimen.

Mr. O. E. Stanley an unknown specimen from British Columbia.

Mr. Claire Holdredge spoke of a prospective trip in the Burns area. The account of what to find in this area was so interesting that a future trip will be planned.

Mr. Thomas Carney showed a very exquisite specimen of Aragonite calcite crystals from Death Valley.

Mr. Bruce Schminky told many interesting experiences of the Schminky family trip to the Steens Mountains.

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Oligocene Starfish Discovered

Found at Snug Harbor, on the Willamette River about six miles south of Salem. This find is said to be rare as no one has reported a starfish specimen. Mr. Louis Oberson discovered three specimens.

****

In this bulletin we have the five-year index of Geological News Letter. We are in debt to Mrs. Florence Richards for this fine piece of work; and those who are saving their bulletins will find this a valuable addition to the library.

Volume 5 now goes to the binder, and we would appreciate having copies of this index returned to replace those we are including with Volume 5.

****

NEW MEMBERS

Mrs. Norman M. Smith	Mallory Hotel.
T. C. Smith	3106 NE 24th Avenue.

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 16 PORTLAND, OREGON Aug. 25, 1940

OFFICIAL PUBLICATION OF THE

GEOLOGICAL NEWS-LETTER
Official Publication of the
Geological Society of the Oregon Country
344 U.S. Court House, Portland, Ore.
POSTMASTER: Return Postage Guaranteed

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Executive Board

J. C. Stevens	President	434 NE Royal Court
A. W. Hancock	Vice-Pres.	2704 SE 84th Ave.
Miss Rose Jennings	Secretary	609 SW Lincoln St.
Miss Helen Iverson	Treasurer	5125 NE Couch St.
Clarence D. Phillips,	Director	
Ray C. Treasher,	Director	
Carl P. Richards,	Director	
Edwin T. Hodge,	Director	
Arthur M. Piper,	Director	

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Editor-in-Chief and Business Manager

Raymond L. Baldwin
344 U. S. Court House
Portland, Oregon

Associate Editors

Edwin T. Hodge		A. D. Vance
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Address

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Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 5th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday Aug.22 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN, 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Aug.23 — CRYSTAL STRUCTURE OF SNOW AND ICE. Mr. Max Demorest, Research Fellow of Yale University, who has been engaged this summer in a study of the crystalline structure of snow and ice on Mt. Rainier, will tell us about some of his findings with regard to this important "mineral". A generous attendance is particularly desired for visiting scientists. Lecture will be illustrated.

Aug.25 — Trip cancelled.

Thursday Aug.29 — Noonday luncheon at the ORANGE LANTERN.

Aug.30 Sept.2 — GRANTS PASS AND CRATER LAKE TRIP. This trip promises to be one of the best trips of this year. John E. Allen, who has been a naturalist at Crater Lake National Park, will be the leader.

Thursday Sept.5 — Noonday luncheon at the ORANGE LANTERN.

Thursday Sept.12 — Noonday luncheon at the ORANGE LANTERN.

Friday Sept.13 — ALASKA IN COLOR. Mr. O. E. Stanley, recently returned from a cruise to southwestern Alaska, will show colored slides depicting the geography, geology, and culture of the region traversed - Skagway, Carcross, White Pass region, Lake Tagish, Mendenhall and Taku Glaciers. This lecture will be even better than taking a trip to Alaska yourself. Your neighbors will enjoy these evening meetings. Come early if you want a good seat.

Sunday Sept.15 — THE WHITE RIVER REGION OF THE MT.HOOD NATIONAL FOREST. This trip will cover historic points on the old Barlow Trail, scenic lookout points, and geologic features of the eastern Cascade Mountains . The trip will be led by Mr. Eric H. Gordon, District Ranger, stationed at Dufur, by special request of those making the trip with A. W. Hancock last June. The group will leave S.W.Front Ave. and Yamhill St. at 7:30 a.m. and reassemble at the Bear Paw Forest Camp on the Wapinitia Highway, about 3 miles beyond the Olallie Lake road junction, at 9:00 a.m. From here the caravan will swing northerly to Barlow Creek, thence northeasterly across Badger Creek to Tygh Creek and on to the highway at Tygh Valley.

Friday Sept.27 — Dr. William Colburn, of Cranbrook Institute of Science, will lecture on a subject to be announced later.

Sunday Sept.29 The LEWIS RIVER REGION IN WASHINGTON. This trip will include portions of the trip made to Christmas Canyon in 1935, with the lava tunnels at Ole Peterson's as the main goal. Mr. A. D. Vance will lead the trip. Full details will be given later.

****

SCHEDULE FOR LABOR DAY WEEK-END TRIP
with
American Association of Mining and Metallurgical Engineers.

Time: 7:00 a.m. Saturday, August 31, to 10:00 p.m. Monday Sept 2.

Mileage: Round trip about 720 miles, all but 64 miles paved.

Equipment: Old clothes and boots (mines and mills are usually wet and always dirty).
Flashlights or lanterns for underground.
Clothes for banquets in Roseburg and Grants Pass.

Luncheons can be bought along the way. On Saturday the Totem Inn at Drain, is recommended. Sunday lunch at the Benton Mine. Monday lunch at the Crater Lake Cafeteria.

Saturday August 31.

7:00 a.m. (00m.) Leave Portland in time to reach Sutherlin at 1:00 p.m.
1:00 p.m. (190m) Leave Sutherlin in caravan. Meet at highway corner with "Nonpareil" Road.
1:20 p.m (198m) Arrive Bonanza Quicksilver Mine, largest producer in the United States. Examine mine and mill.
5:30 p.m. (198m) Leave for Roseburg.
6:00 p.m. (218m) Arrive at Umpqua Hotel, Roseburg, dinner at 6:30 p.m., followed by talks by Albert Burch, one of Oregon's foremost mining engineers, on the Benton Mine, and by Fay Bristol on Oregon's non-metallic minerals.

Sunday September 1

8:00 a.m. (218m) Leave Umpqua Hotel for Glendale Junction.
9:30 a.m. (269m) Leave Glendale Junction for Benton Mine.
10:30 a.m. (293m) Arrive Benton Mine, one of western Oregon's largest mines and mills. Lunch will be served at a nominal cost at the mine. Inspection of mine and cyanide plant.
5:00 p.m. (293m) Leave Benton mine for Galice. Dinner served at 5:30 p.m. at a nominal cost by the ladies of the Galice Mine Owners Association.
6:30 p.m. (305m) Leave Galice for Grants Pass, up scenic Rogue River Gorge Road. Very slow narrow road.
7:30 p.m. (335m) Arrive Grants Pass. Banquet at Chamber of Commerce at 8:00 p.m. with the Oregon Mining Association. Talks by mining men.

Monday September 2

8:00 a.m. (335m) Caravan leaves Cavemans Bridge under direction of Dr. W.D.Smith and John E. Allen.
8:25 a.m. (354m) Arrive Gold Hill, turn left on Sams Valley Cutoff.
9:00 a m. (380m) Highway stop to see block fault hills.
9:20 a.m. (392m) Arrive Trail. 1 mile off highway to see agglomerate.
10:15 a m. (424m) Arrive Natural Lava Bridge.

12:00 n. (450m) Arrive Crater Lake Rim. Lunch at Cafeteria.
1:00 p.m. (450m) Leave Cafeteria for Rim Drive. Several stops will be made at points of the rim to point out features.
2:00 p.m. (462m) Those who want to return to Portland Monday night should leave via the north entrance by 2:00 o'clock, going by way of Sand Creek, Chemult, and the new Willamette Highway, a distance of 258 miles. (The Wapinitia Cutoff route is 296 miles).
10:00 p.m.(720m) Arrive Portland (if you have made good time!)

* Members of the A.I.M.E. will visit some of the large gold dredges in the Rogue River area, and those of the GSOC who wish to take this trip rather than the Crater Lake trip are welcome to join them.

****

MEMBERS OF SOCIETY PRESENT PAPERS AT G.S.A. MEETING AT SEATTLE.

At a joint meeting of the American Association for the Advancement of Science and the Geological Society of America in Seattle, June 17-23, 1940, several papers by members of the Geological Society of the Oregon Country were presented at the meetings of Section E (Geology and Geography). Abstracts of these papers were published for the meeting and will again appear in the December 1940 Bulletin of the Geological Society of America. Permission to reprint these abstracts in the News-Letter has been given by the Geological Society of America and are as follows:

GROUND-WATER PROBLEMS IN THE PACIFIC NORTHWEST*

by Arthur M. Piper.

The ultimate social, economic, and industrial evolution of the Pacific Northwest probably will be determined to a considerable degree by its water supplies. Among the sources of water, those derived from beneath the land surface - that is, from bodies of ground water - are by no means inconsequential.

With respect to ground water, the region can be divided into at least four provinces whose extent is determined by geologic, geomorphic, and climatic factors. These four are: the Northern Coast Ranges province, the Puget-Willamette Trough province, the Columbia Plateau lava province, and the Northern Rocky Mountain province.

The mode of ground-water occurrence and the major ground-water problems of each province are described; the status of systematic ground-water surveys in the region is also reviewed.

DISTRIBUTION OF HISTORIC EARTHQUAKES IN THE PACIFIC NORTHWEST

by Ray C. Treasher.

Plotted locations of recorded earthquakes in the Pacific Northwest are concentrated in the Puget Sound Area particularly in the Olympic Mountains, at Seattle, Everett, Sultan, and Bellingham. Other localities, in eastern Washington, are at Chelan, Ellensburg, and Walla Walla. The Walla Walla recordings are due to the State Line earthquake with an epicenter near Milton and Freewater, Oregon. Oregon

*Published with permission of the Director, U. S. Geological Survey.

is notably free of earthquakes. The principal exception is the State Line Earthquake. The conclusion is that the Pacific Northwest is relatively stable except for the Puget Sound Area.

GEOLOGY OF THE PORTLAND (OREGON) AREA

by Ray C. Treasher.

The areal geology of the Oregon portion of the Portland Troutdale quadrangles and the north half of the Oregon City and Boring quadrangles is being mapped for the Oregon State Department of Geology and Mineral Industries. The oldest formation is basalt that probably correlates with the Columbia River basalt. It is overlain, unconformably, by the Troutdale formation, a torrentially bedded series of sandstones, lava grit, and pebble conglomerates and here considered as of Pliocene age. Erosion produced a mature surface on the Troutdale formation with relief of about 400 feet, onto which poured a series of volcanic flows of local origin. These flows, the Rocky Butte volcanics, capped many of the hills and filled some of the valleys prior to or during early stages of continental glaciation. Glacial melt waters from Mount Hood poured down the Sandy and Bull Run rivers, tore out portions of the Rocky Butte volcanics, deposited outwash on the Boring Surface, and dumped eroded Rocky Butte volcanics and surplus outwash in the Columbia River valley. This debris forms the Portland Gravels. At the same time, waters in the Clackamas Valley deposited eroded Troutdale formation and outwash to form the Clackamas Gravels. From some unknown source, a thick deposit of fine-grained silt with loessial characteristics was deposited over the Portland area to a maximum thickness of 200 feet.

Weathering is deep, and some of the surface gravels, lava rubble, and lava-in-place are altered to clayey materials. This type of weathering is not uncommon in the area west of the Cascade Range and is herein designated as the Mayger type of weathering from the type locality at the Fransen pit near Mayger, Oregon.

OREGON SHORE LINE

by Warren D. Smith

This paper deals with some of the more essential features of the Oregon coast and particularly some of the recent changes that have taken place. The Oregon shore line is composite. In the first part of the paper there is a short discussion of the classification under which different parts of the shore line are considered.

This is followed by a discussion of eight or ten of the most striking geological and scenic features of the coast from the California line to the Columbia River. The Oregon coast may be divided generally into a southern portion from the Coquille River south where the shore line has been developed in older and harder rocks, and a northern portion, developed in younger Tertiary formations, which are much softer.

The paper concludes with a few of the more important changes in human geography along this coast line within the last 10 years which are directly or indirectly referable to the geological features.

CHROMITE IN OREGON

by John Eliot Allen

Chromite deposits occur in the Klamath Mountains of southwestern Oregon and in the Blue Mountains of northeastern Oregon. They always occur in peridotite, dunite, serpentine, or associated ultrabasic rocks, thought to be Cretaceous.

The most common ore bodies are tabular lenses, though many are pod-or kidney-shaped masses, and some are narrow dikelike seams, stringers, or irregular patches. With a few important exceptions, all are small. Of 229 bodies at 141 localities in the State, only 42 gave promise of yielding over 100 tons of ore.

The attitudes of the ore bodies with respect to each other and to the surrounding rock structures and contacts strongly suggest structural control of emplacement. They usually lie within zones of hydrothermally altered rock essentially parallel to the trend of the elongated peridotite or serpentine. These zones also intersect, forming diamond-shaped strain patterns with respect to the contacts of the intrusion. The larger ore bodies seem to occur at the intersections of these zones. The longer dimensions of the ore bodies within the zones may be parallel, en echelon, or even at right angles to the trend of the zone, but in any one group they have similar orientation.

TECTONICS OF THE NORTHERN WALLOWA MOUNTAINS, OREGON

by John Eliot Allen.

The thick Permian (?) metavolcanic series and the Triassic marbles and slates of the northern Wallowa Mountains are intruded by the Wallowa granodiorite batholith and folded and faulted. An eastward-extending apophysis of the granodiorite, the McCully prong, divides the metamorphics into the northern or Hurricane series and the southern or Imnaha series.

The 10,000-foot section exposed in the Hurricane area is folded into a northwest-trending syncline, breached near its center by the Sawtooth granodioritic boss. At the southern end of the syncline, where it abuts against the McCully prong, the marbles are intensely folded and contorted.

The folding of the 13,000-foot series exposed in the Imnaha area consists of three well-defined anticlinal structures and their corresponding synclines. The strike of these folds trends northeasterly, paralleling the southern side of the McCully prong. They consist of asymmetrical and sometimes overturned and isoclinal folds, the latter occurring in marble.

Faulting parallel to the strike of the folding occurs in both areas, with the down-dropped sides of the faults always on the east, away from the batholith. In the Imnaha area at least four such step faults occur within 3 miles, with displacements of about 500 feet.

Tertiary faulting, with trends predominantly north-south, accompanied extrusion of basaltic lavas and resulted in the numerous north-south-trending basaltic dikes appearing throughout the region in both granitoid and metamorphic rocks. Late Tertiary folding and faulting along a northwesterly trending zone resulted in the uplift of the entire northern Wallowas as a block and the formation of the great mile-high escarpment which makes up the north front of the range.

MINERAL RESOURCES OF THE NORTHWEST

by Edwin T. Hodge.

The development of great hydroelectric plants such as Grand Coulee and Bonneville warrants consideration of possible hydroelectric industries. Studies made by the writer yield the following results:

Many small iron ore deposits exist, but an economic smelting unit must depend upon large deposits of magnetite located on the southern coasts. Limestone can be most economically obtained from Dall Island, Alaska. Refractory and ceramic clays occur in Lane County, Oregon; Cowlitz County, Washington; and Latah County, Idaho.

Large deposits of silica occur near Spokane. Magnesite for refractories and metal occur in a large deposit near Chewelah, Washington. No manganese deposits of sufficient size or quality occur unless those at the northern end of the Olympic Peninsula can be proven economical. Numerous small chromite deposits occur in Oregon and Washington. There are only prospective occurrences of cobalt, tin, tungsten, molybdenite, and nickel. A lead and zinc treatment plant for areas not well served has no present assured tonnage. Saline deposits are probably widespread. Great phosphate deposits occur in southeastern Idaho which might be treated by a plant on the Snake or upper Columbia rivers.

STRUCTURE AND PETROGRAPHY OF THE OREGON CASCADES

by Edwin T. Hodge.

The Oregon-Washington Cascade Mountains lie between and overlap onto older highlands of northern Washington and southern Oregon. Below, eastern continental volcanics and western marine sediments of early Eocene age met, were eroded maturely, and overlain by lower Miocene pyroclastics (Warrendale), middle Miocene Coriba lavas; both were gently folded in late Miocene, eroded youthfully in early Pliocene, yielding the Coriba surface which extended from the Coast to Idaho.

Upon Coriba surface the Cascade Range was built as a pile of volcanics along a north-south zone of close folding and faulting and as a belt 50 miles wide on either side. Volcanism, yielding 90 per cent lavas and 10 per cent pyroclastics, continues to the present time. Troutdale formation lies under the Dalles Beds, is deeply weathered, and related to an older series of Pliocene andesites. Many pyroclastics formed torrential Dalles formation of late Pliocene, lying on Rattlesnake of middle Pliocene.

BONNEVILLE-GRAND COULEE POWER AND ALASKAN MINERALS.

by Edwin T. Hodge.

The hydroelectric sites of Grand Coulee and Bonneville are being interconnected with each other and the Seattle-Portland coastal areas. Their power will soon be available for electrochemical and metallurgical industries. Alaska can be the main source or serve as a supplemental source for mineral raw materials. For a steel industry the magnetite-copper deposits of southeastern Alaska and of Iliamna Bay can serve as supplemental sources. Alaskan coal is no better than coals available in Washington. The Northwestern States are deficient in pure limestone located economically close to industrial sites, and those of Dall Island, Alaska, can be laid down in Portland at a lower cost.

The lead and zinc deposits of Alaska may benefit by the establishing of treatment plants on tidal waters. Electro-alloy industries now dependent upon foreign sources justify exploration of the tungsten possibilities of Alaska. Chromite is not known to occur in Oregon and Washington in bodies large enough to permit low cost production, but at Port Chatham and Red Mountain, Kenai Peninsula, there is a deposit of 240,000 tons.

The dependence of the United States upon foreign antimony might be eliminated by plants to treat antimonical ores that are widespread in Alaska, for example near Fairbanks.

GLACIAL HISTORY OF SOUTHEASTERN WASHINGTON

by Edwin T. Hodge.

The basin of southeastern Washington was drained by westward- and northward-flowing streams. The former were dammed by Pleistocene volcanics, and the latter by the Continental ice sheet. Ponded waters filled the valleys of the Columbia Mountain system but did not submerge the higher ridges; they spilled over cols in the Sanderson-Cheney divide, deepened them, and so directed the course of ice lobes from the advancing ice-front. The glaciated cols produced the coulees, such as Grand and Moses. The ice reached as far south as Ephrata and Ritzville and over the area plucked the highly fractured basalt to make great gravel deposits and left holes filled with ice which are now sheer-walled undrained basins. Loess and gravel were spread over the greater part of the area, burying ridges and forming a lake-bed surface with an initial south-sloping surface. The lake was drained by an overspill at Wallala Gateway. As the glaciers melted, streams flowed southward over this surface. Some, and particularly the Columbia, were superposed over ridges, such as Horse Heaven, Rattlesnake, Frenchman, and Waterville-Adrian. These streams were often choked and dammed by ice-floes and so were forced out of their channels. Repeated damming of the diversion channels produced a complex anastomosing complex of channels incised in the basalt. Erratics rafted by ice blocks were stranded over the area and in addition along the Columbia and Willamette valleys in Oregon. Similar events followed a second and third advance.

****

OREGON'S MINERAL INDUSTRIES AND MINERAL RESOURCES

by F. W. Libbey.

Oregon's active mineral industries in the order of importance are in the following categories: Metals:- gold (silver), quicksilver, platinum (osmiridium), copper, and lead; Non-Metals - sand, gravel, and crushed rock; limestone, clay, agates - semi-precious stones, diatomite, coal, monumental stone, silica, pumice, mineral waters. In addition, the State has known potentially valuable deposits of chromite, iron ore, manganese, nickel, antimony, zinc, salines, marble, building stone, and peat.

Of the metals, gold production is the largest, amounting to $3,188,500 in 1939 - a 11% increase over 1938. Lode mines accounted for about one-third of the gold production. Placer production is mainly from dredging. In May 1940 there were 26 operations classed as dredges; 5 were standard bucket line; 15 were dragline; and 6 used power shovel excavators.

Quicksilver is second in value to metallic production, increasing from $348,000 in 1938 to $477,293 in 1939. Oregon ranks second among the states in value of quicksilver production; output is increasing rapidly.

Value of Oregon's non-metallic mineral production in 1939 is estimated at $5,500,000. The largest part of this value is from sand, gravel, and crushed rock used in construction. Limestone, chiefly processed to make Portland cement, ranks second. The State has large reserves of good grade stone.

As the population of Oregon and the Northwest increases, the value of Oregon's non-metallic mineral production will become increasingly important in the State's economy.

****

Portland, Oregon.

Dear Jim:

Some time ago you were informed that we had become amateur geologists to the extent of buying a couple of books and joining the Geological Society of the Oregon Country. Now I've found a new pleasure in connection with this organization. There is a luncheon held every Thursday on the fourth floor of the Central Building on Tenth Avenue just north of Alder. The elevator girl always announces the luncheon so that I feel that I'm really stepping out and the luncheon always fulfills that feeling.

This luncheon is informal and a grand way to learn a bit about geology, mineralogy and the members themselves. Just to let you know how interesting it really is I'm going to tell you about the luncheon held August 15th.

There were twenty-five or thirty present among which werenine professional geologists and amateurs ranking from almost professional Mr. Hancock of recent mastodon fame to yours truly, who hardly knows what a mastodon is. (You'd better look it up).

Mr. Stanley told us about a tree cast he had seen that morning in Linnton at 110th Avenue above the St. Helens road and just to the right of the stairway up the hill.

Dr. Francis T. Jones had some polished slabs of fern wood from Baker, Ore., and a nice sized piece of matrix containing feldspar crystals as well as some "faceted agates" from this same matrix. This came from Lime, Oregon. He also had a specimen of tectite from Indo-China. He introduced his nephew, F. Burton Stone of Morgan Hill, California, as he said it is appropriate to always bring a "stone" to the luncheon.

Mr. Carney showed a beautiful specimen of aragonite crystals group showing copper stains. This is a very rare specimen.

Mr. Piper introduced George C. Taylor, a new and nice looking junior geologist who has been assigned to the U.S. Geological Survey for work in the Columbia Basin area.

Mr. Nixon was present and it was good to see him again back from Peru. He told us the true story of his airplane landing in Panama - which was exciting, especially when the lady passenger received potato salad in her hair from the bump. He also described visiting a coal mine, where the method of extracting by iron bars and carting 35 kilometers over a 15,000 foot pass in gunny sacks on

the backs of llamas to be sold ultimately for approximately $3.75 a ton, brought to mind the swift delivery of fuel here by fast truck service. Do you remember when our folks paid $15.00 a ton for coal?

Dr. Booth showed some interesting specimens which I list here with their chemical formula as well. If you can't transcribe them, you'd better get out your old chemistry book. Here they are:

Actinolite $(Ca_2(MgFe)_5(OH_2)Si_4O_{11})_2$.
Calcium-Magnesium iron amphibole from Chester, Vermont. It is related to jade and asbestos.

Kyanite (Al_2SiO_5)
Blue, long bladed crystals structurally like Sillimanite from Judge Bridge, New York.

Tremolite $(CaMg_3Si_4O_{12})$
Calcium-Magnesium amphibole which is white to dark grey and is from Falls Village, Conn.

He also introduced his son, Charles Francis, who is home from Yale for the summer. His son isn't the dyed-in-the-wool geologist explorer the Doctor is, but give him time.

Last Sunday's trip for fossils and water agates was successful according to reports. The amusing side, however, was Tom Carney's and Leo Simon's alibi for not "catching up" with the main party. Their stories were pretty convincing, though, and Mr. Hancock presented each with a tiny water agate, presumably for imagination. This brought a protest from Mr. Ken Phillips who declared it unconstitutional for anyone, Mr. Hancock in particular, to conceal specimens in his or her pockets without showing them to the rest.

Miss Henley showed a small crab which she found Sunday while with Mr. Simon, thus substantiating his story.

Mrs. Minar and her daughter were introduced as first time luncheon members.

I could go on and on as there is always so much of interest at these luncheons, aside from good food. I always come home more enthused than ever. I shall write often and let you know about the goings on.

Katie.

****

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Telephone Number Occupation

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_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

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Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & TAYLOR.

DATES TO MARK ON YOUR CALENDAR

Thursday Sept.12 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Sept.13 — Subject: ALASKA IN COLOR
Speaker: O. E. Stanley
Mr. Stanley has recently returned from a cruise to southeastern Alaska. He will show colored slides depicting the geography, geology, and culture of the region traversed - Skagway, Carcross, White Pass region, Lake Tagish, Mendenhall and Taku Glaciers. This lecture will be even better than taking a trip to Alaska yourself (no mosquitoes). Bring your neighbors and come early.

Sunday Sept.15 — THE WHITE RIVER REGION OF THE MT.HOOD NATIONAL FOREST. This trip will cover historic points on the old Barlow Trail, scenic lookout points, and geologic features of the eastern Cascade Mountains. The trip will be led by Mr. Eric H. Gordon, District Ranger, stationed at Dufur, by special request of those making the trip with A. W. Hancock last June. The group will leave S.W.Front Ave. and Yamhill St. at 7:30 a.m. and reassemble at the Bear Paw Forest Camp on the Wapinitia Highway, about 3 miles beyond the Olallie Lake road junction, at 9:00 a.m. From here the caravan will swing northerly to Barlow Creek, thence northeasterly across Badger Creek to Tygh Creek and on to the highway at Tygh Valley.

Thursday Sept.19 — Noonday luncheon at THE ORANGE LANTERN.

Thursday Sept.26 — Noonday luncheon at THE ORANGE LANTERN.

Friday Sept.27 — Subject: MINERAL CRYSTALS.
Speaker: Dr. William Colburn.
As curator of the department of geology and mineralogy in Cranbrook Institute of Science, Bloomfield Hills, Michigan, Dr. Colburn brings to us a wealth of experience in the study of minerals and their crystal form. The lecture will be illustrated with slides in color. Dr. Colburn will also discuss methods of preparation and care of mineral collections.

Sunday Sept.29 — THE LEWIS RIVER REGION IN WASHINGTON. This trip will include portions of the trip made to Christmas Canyon in 1935, with the lava tunnels at Ole Peterson's as the main goal. Mr. A. D. Vance will lead the trip.

The following item appearing in papers explains the happy smile on the face of Grandfather Franklin Davis: "Born to Mr. and Mrs. G. M. Allen, Jr., a daughter - Denison Paige - on July 21st." We hope Grandpa Davis will impress early on Denison Paige the advantages of membership in Geological Society of the Oregon Country.

We wish to thank Mrs. Campbell and Miss Henley for their splendid work and assistance given Mrs. Richards in preparing the Index to vols. 1 to 5 inclusive, of our News-Letter.

We received a letter from Mrs. Roy Swanson (Connie Endres) in which she called our attention to the fact she was married on June 15 and not July 15 as was printed in the News-Letter. She also said they live on N. Cambrian Street, Bremerton, but the only rocks she had been able to find were on the golf course. (We have heard some of the wives of members remark that a golf course would be a good place for the rocks - rather than basements).

Remember the good times we have had at the Jones home? Fall is in the air, and it is time for another Harvest Home gathering. This is to warn all members that in the near future we will meet with Dr. and Mrs. Jones, so do not be surprised when you get a call from the Social Committee.

We missed Mr. Tom Carney at the Thursday luncheon, Sept.5th. Mr. Carney was at Salem, arranging material for Marion County exhibit at the State Fair. Mr. Carney has had charge of this work at the Fair for several years.

President J. C. Stevens and Mr. E. N. Bates were at Spokane last week, attending a regional meeting of American Society of Mechanical Engineers.

Mr. and Mrs. Barr are motoring to Illinois on a vacation trip.

Mr. and Mrs. Mahony incorporated the Labor Day trip to Crater Lake in their vacation and are now geologizing in Eastern Oregon.

Mr. Clair P. Holdredge gave an illustrated lecture on Colombia with colored movies in Central Library Hall, Thursday evening September 5th. He discussed geography, industries, life of foreigners in South America, and transportation.

****

CHANGE IN ADDRESS

Miss Emily Marshall	BE 6720	3471 S.W.Patton Road
Mr. & Mrs. G. S. Paxson	Route 4 Box 340-A	Salem, Oregon.

****

N O T I C E

Those of you amateur geologists who wish to acquire some knowledge in the field should take Dr. Hodge's course in Geology which is given by the Portland Extension Center at Lincoln High School. Dr. Hodge's classes are just as interesting as his lectures, if not more so, and his course will be introductory, dealing with the processes at work changing the face of the earth. This includes the interal structure, composition, and activities of the earth; the economic geologic deposits; a survey of the main events in the history of the earth; and a study of prehistoric life, including geological backgrounds of man and current events. The course will start September 29th.

CANNON BEACH TRIP.

Dikes, sills, and some spectacular folding were among the things of geologic interest seen at Cannon Beach by members of the Geological Society of the Oregon Country when visiting that area, Sunday May 19. Most of the group left Portland Saturday afternoon via the Wolf Creek Highway. Stops were made along the way to study the geology and to gather fossils. That evening there was a campfire meeting on the beach, at which Mr. H. F. Travis, co-leader with H. B. Schminky, told some of the interesting legends and historical facts about the region.

Sunday morning, the group visited several points of geological interest along the beach south of town, then had lunch at Ecola State Park, and spent the afternoon on a hike through the park and along the beach. At the first stop in the morning a dike was seen about a foot wide in a shale bed with a sand layer on top, also a sill, a good example of igneous rock fingering into sedimentaries and baking. Mr. Lloyd L. Ruff and Mr. John Allen, geologists, led the discussions and explained various features seen. At one point where a deep gash had been made in the embrankment by wave action, Mr. Travis stated that a year ago this bank was almost vertical. Douglas Johnson's book, "Shore Lines and Shore Processes", was recommended for reading by Mr. Ruff, who explained about the work of jetties and wind currents along our Pacific coast.

At another place there was an intrusion in fine gravel, which it was thought might once have been a stream bed. Some of the gravel was baked into the lava. A heavy sandstone lens, 3½ feet thick, also sandstone beds showing foreset bedding, were seen. At Silver Point pyrite "nuggets" were collected. The group viewed with interest some redwood logs with their roots attached, the wood in perfect condition. They have evidently been buried and protected by sand for a long period of time. They were exposed about 3 years ago, said Mr. Travis. He told of the belief that the redwoods may have lived in that locality at one time.

Returning towards the town of Cannon Beach a stop was made to see the cannon from which the town received its name. It once was on the U. S. revenue cutter Snark, which was wrecked at the mouth of the Columbia River.

The afternoon hike through Ecola State Park was to Indian beach at the northern limits of the park. The trail follows along the top of a high bluff overlooking the ocean. On the way, a short side trip was taken to see some interesting falls in Indian Creek, having a deep pool, or "punch bowl", at its base. A "kitchen midden" was also visited at the edge of the beach and a short time was spent investigating it. No valuable finds were made. We hiked southward along Indian Beach where the geological features were observed and discussed. The most interesting formation of all was found here, real "picture" geology, as expressed by Mr. Ruff. He said this was as good an example of folding as can be seen anywhere along the coast. Layers of sandstone and shale have been squeezed and twisted into folds by an igneous intrusion. Some sections of it were seen completely surrounded by the lava. At this point a rocky formation jutted out into the ocean, making it necessary either to climb a 200-foot bluff to regain the trail, or walk some distance back along the beach. It was decided to climb the bluff. To accomplish this, the party followed in the wake of that first trail maker, the elk. It may be mentioned that the footsteps of an elk climbing a steep bank are somewhat farther apart than the steps of the family staircase.

About twenty-five were in the group who made the trip to Cannon Beach.

- E. M. Barr

CANNON BEACH TRIP.

A small but enthusiastic group met at Vernonia Junction, the present beginning of the Wolf Creek Highway, and made several stops to decide about some of the marine and intrusive formations before the coast was reached. Mr. Lloyd Ruff gave valuable opinions about the fossils, structures, and probable causes of present deposits.

The arrival at Cannon Beach, justly named "the beach of a thousand wonders", occurred at 6:30 p.m. The party then split up to secure cottage or hotel quarters for the night.

At 8:00 p.m. all reassembled in the lee of Chapman Point for a bonfire of driftwood and a conference on the things to be seen the following day.

Winter storms had grounded and moved a huge spruce log to an ideal location and deposited the small logs and drift near for a fire made beautiful by the chemicals of old ocean and released only by intense heat. While enjoying these gifts of the sea and inland mountains, Mr. Schminky, the trip leader, outlined his plans for the Sunday section of the trip. The writer was to give highlights of the background, history, and legend of Cannon Beach. An attempt is here made to highlight the highlights of that most informal chat. Our good president would not even have the speakers stand while talking, but lounged on a log and drifted along.

The Beach was visited, according to historical record, by a captain in the Lewis and Clark party with the object of securing whale products from the Indians who were fortunate enough to find a sperm whale stranded. He was entertained in "the cottages" of the Indians but had hard bargaining to get whale oil. Finally he did get a little for the medicine chest at the salt cairns at Seaside where the balance of the party was busy on the salt supply for the party. The creek where "the cottages" stood has since yielded the skull of a sperm whale that was dug from the mud by R. A. Price, the owner of the property. The captain left his mark by naming the creek Ecola, the local Indian name for whale.

The name Ecola was taken for the present Cannon Beach postoffice but due to confusion with Echo was changed to the present Cannon Beach. The original postoffice of that name was about seven miles farther south and was served thru boats and mail carriers from Nehalem Bay. The name itself came from the iron cannon and a swivel gun from the bow wreckage of the revenue cutter Snark that was lost at the Columbia's mouth. This piece came in and out on the lower beach until one gun broke loose to lie in the drift pile for years. That one is now mounted and on display. The second iron muzzle-loader is now sunk with a piece of the deck and appears every few years at a very low tide when the sand is right. Legend has it that the brass swivel gun was packed by mule to Seaside and there traded for a five-gallon demijohn of whiskey. The story goes that the demijohn got to the beach several days later, with the mule and men a little the worse for the trip. Of course the container was empty and long served as a storage place for water.

One of the early mail carriers still lives and is active at the north end of the beach. She is Mrs. John Gerritse and tells thrilling true tales of the hazards of those early trips. One point of especial danger was Hug Point. No, not named from the practices of young summer tourists, but from the foot and hand holds cut into the sandstone of the point and hugged for dear life by the travelers to prevent a fall into the waves below at high or stormy tides. The faint traces of the cuts still are visible but are no longer used.

Following the Indians were the hunters, beach combers, and some English remittance men; but the real settlement of the area was undertaken by twenty families together who selected homestead sites in order of value and at the end of a month drew them by number as they ranged in supposed value. The last two pulled out without clearing. #1 is still in the hands of the original owner with the exception of the parts that have been sold by lots to the later horde of resort cottage owners.

Cannon Beach is now a general district of towns and groups spread about ten miles along the coast.

There is a condition in the area which makes it the most fog free piece of the North American coast. The fact was discovered from the reports from Coast and Geodetic survey crews where hourly reports were made on the visibility of survey targets over a period of years. The facts were published in the Scientific American Magazine as compiled in the reports to the government.

When present contracts are completed, the roads to this wonderland of beauty and geological interest will be traversed by the famous Highway 101 and will be open to all the coast travelers where a paradise of dikes, twisted sandstones, and marine shales have buried forests layer on layer. Other wonders also will be seen from the roads or within yards of the highway. From here that age old "wish I could see a storm" may be gratified.

- H. F. Travis.

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The Chamber of Commerce was advised this week that Oregon's mining industry is increasing rapidly, probably faster than any other basic industry in the state, according to Earl K. Nixon, director of the State Department of Geology and Mineral Industries. Judging by official figures just released by the Statistical Division of the U. S. Bureau of Mines, the value of Oregon's production of metallic minerals and ores increased 16.6 percent in value from 1938 to 1939.

For the current year, 1940, metallic mineral production of the state will be increased by 50 percent over the 1939 figures. Adding in the value of non-metallic production for 1940 of around $6,000,000, the state's total mineral production will be well in excess of $10,000,000 for the current year, perhaps nearer $12,000,000.

- Commerce Bulletin, August 31, 1940.

HASKINS CREEK TRIP.

The June 16th field trip of the Geological Society of the Oregon Country was for the most part in the drainage basin of the North Yamhill river. The many ridges and rolling hills in this part of the Coast Range foothills represent several thousand feet of Tertiary sediments, probably Oligocene. Some basaltic lavas and intrusives occur in the steeper canyons in the western part of the area. The countryside was blue with vetch in blossom, and the many wild flowers all along the way claimed a good share of attention at every stop.

The first stop in the morning, after assembling at Forest Grove, was at Gaston, to see Wapato lake, now drained and used as farm land. The water is pumped out and the land protected by a dike. At the south end of it is the Chehalem river drainage, and to the eastward is Chehalem Ridge. It was suggested that the Willamette river may have come through this area at one time.

The group left the main highway at Gaston and traveled westward into the hills. At the high point on the road, near the Oak Hill school, was the next stop. Here was seen some deeply weathered massive sandstone of the Oligocene series. Included is a layer heavy with mica, 2 or 3 inches thick. Most of the sand is quartz, with some mica. The question of whether the sand was beach or stream laid, was not settled. Two brief stops were made at viewpoints to study the regional geography.

The lunch period was spent at the Haskins Creek dam, which impounds the water supply for McMinnville, 12 miles distant. Mr. M. H. McGuire, superintendent of the McMinnville water and light system, was introduced, and he told about the development of that city's water system. The drainage area consists of 5,000 acres, and of this McMinnville now owns 4,000 acres. The reservoir behind the earth dam forms a beautiful lake in a setting of forest trees. Mr. McGuire explained that a unique feature of the dam is the series of balanced control gates, designed by the Society's president, Dr. J. C. Stevens. One of the few exposures of igneous rock seen during the day was in the canyon wall near the gates, at one end of the dam. Between the basalt flows is a layer of finely bedded shale, in which H. B. Schminky found a fish scale, similar to those found in Miocene shales at Jump-off-Joe, near Newport.

After lunch in the little picnic ground at Haskins Creek dam, the party drove to the Fairdale mineral springs, close to the banks of the North Yamhill river. The manager welcomed the visitors and told something of the history of the springs. He said the place used to be frequented by deer because of the water's salty taste. Sampling of the waters in true scientific spirit, the members found them to be heavily charged with magnesium sulfate (epsom salts). There was a large exposure of shale near the spring, some of it so altered it was almost slate.

The last stop of the day was at an abandoned plant of the Flora Lumber Company for a hike along the logging tracks to a viewpoint overlooking the deep and beautiful canyon of the North Yamhill river. Here a survey has been made by the U. S. Army Engineers to determine the feasibility of a storage dam for flood control and irrigation. Much of the canyon is cut in lavas and intrusive basalts in the form of dikes and sills. This probably represents the same lava series noted at Haskins Creek dam. Age was tentatively assigned as early Oligocene or possibly Eocene. Formations in the railroad cuts also include weathered micaceous sandstones and shales. No fossils were found, although small fragments of plant remains were observed in some of the strata. Deeply weathered and exfoliated basalts were common along the tracks.

- Lloyd L. Ruff.

Portland, Oregon,
August 30th, 1940.

Dear Jim:

Since our last letter I've attended a couple more Geology luncheons and have lots to talk about.

As you know last winter we "took" Dr. Hodge's course in Geology in night school and at the luncheon a week ago he was present. He had just returned from his summer vacation work and, while he brought back 500 pounds of specimens, he maintained they were for a student who was to begin work on his master's thesis. However I heard some low-voiced comment on his "gold mine" which, he said, looked pretty good.

The luncheon of course provides good food but Leo Simon brought some "French bread" which turned out to be volcanic bombs that he had obtained over in central Oregon along the Crooked River. Tom Carney favored the ladies, however, and brought what appeared to be a beautiful powder puff but was in reality a specimen of mordenite. John Allen had a number of specimens which had been obtained by one of the Mazamas on a recent trip in Idaho as he had casually remarked he desired a rock brought back. There were some pieces of the lava formations from the Craters of the Moon; some cemented material from top of the summit of McGowan Peak in the Sawtooth Range which is about 10,000 feet, and a knife-edged piece of sandstone from Mt. Borah, which is 12,665 feet in height. Those Mazamas sure climb around in some high altitudes.

Mr. Bates had been on a trip back east and brought back some specimens and pictures. One of these pictures of the Shoshone Dam Valley road brought back fond memories to Mr. Vance, who had spent five years in the locality during the locating and building of the dam. It also reminded us of our trip thru there three years ago at which time we knew nothing about geology and were inspired only by the grandeur of the scene.

John Allen had recently returned from the Fort Klamath section and near the Chiloquin turnoff had seen a grand example of a slickenside on a fault escarpment. This he said was a flat fault approximately 200 feet long and 100 feet high. The erosion has been such that the solid rock rises to within a foot of the surface and the erosion had made an alluvial fan.

Helen Iverson, one of the Three Musketeers, was present but she slipped out before the luncheon was over. Miss Fowler and Miss Smith were there and Mr. Stevens tried to introduce them as new but they informed him that he had been absent on their previous visits.

J. Martin Weber, resplendent with a yellow rosebud in his coat lapel, told about a trip in the Santiam section. While there he met a man digging a well and let himself in for something when he admitted he had graduated from college. It seems the man, who was then down eighteen feet, desired to know when he should strike water and, as of course a college graduate should know everything (???) requested such information from J. Martin. J. Martin didn't know and had to fall on the old bromide of using a water witch stock. Consequently, as far as he knows, the man is still digging. He did find, when he climbed down in the well, that the man was then digging thru shale and had located a nice fossil leaf. Mr. Hancock identified it as quaking aspen, and thus located it as no older than Pleistocene, which is only fifty thousand years or so old.

Oh, yes! The Society has been vindicated. Why? Well, the cashier inadvertently gave someone a ten-dollar bill in change for a one and when the group was questioned - quite blank and innocent faces appeared. The money was discovered, however, and an apology given.

Yesterday at luncheon Mr. Stevens appeared sans tie, it really was hot, and maintained that he believed in emancipation of clothing for men and that one could appear as they desired. He spoke too soon for it wasn't long before he got himself in a jam, gooseberry to be exact, which he or Miss Jennings spilled - they both took the blame.

It was very gratifying to note that, although we women are noted for being late, there were five women present before a single male appeared on the scene.

Claire Holdredge said that he had gathered up a few odds and ends of things which he had had around his place for two or three years and passed a specimen of a pebble with a hole thru it which was of the Cretaceous age. He had no explanation except that it might be a fossil "peephole" and said the Indians in northern Washington where such pebbles occur maintained they were caused by rock worms. Dr. Hodge gave quite a scientific explanation for the phenomenon and I in all innocence took it as the truth until the actions of the professionals disillusioned me - I still don't know whether to believe it or not. Mr. Holdredge also had some oil sand, some fossil marbles, and a ventifact which was carved by wind-blown sand.

Mr. Simon had some concretions which showed replacement by quartz. Dr. Francis Jones had a piece of meteorite from Odessa, Texas, which is siderite octahedrite and, although the piece was only about an inch and a half in size, it was extremely heavy, weighing 151 grams. Dr. Arthur Jones had a tooth which had come from the Jordan Valley section in Malheur County, and Mr. Vance suggested that it came from a giant ground sloth. Some of the things they pass around give me the creeps when I realize what size of animals they really came from.

Dr. Hodge said that the marbles Mr. Holdredge exhibited were quite common in Yellowstone Park and other places and occurred in rhyolite. While these were more like marbles than anything else he said they were lithothysae, or rock roses.

There were so many things going on that I can't possibly squeeze them in this time. I shall miss a couple of the luncheons as we are going over in eastern Oregon. However, hoping that you snared me some Herkimer crystals when you were on National Guard manouevers in New York State - I'm still

Katie.

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A REVIEW

Felts, W. M., A granodiorite stock in the Cascade Mountains of Southwestern Washington: Ohio Journal of Science, vol.39, no.6, pp.297-316, 4 maps, November 1939.

The granodiorite stock of the East Fork of Lewis River has received little recognition although it is well exposed and reasonably accessible. The G.S. O.C. has made several trips into the area, and have puzzled over many interesting details. Wayne M. Felts of Oregon State College and University of Cincinnati has studied the area in some detail and has published an account of his findings.

Eagle Creek formation and the lower portion of the Skamania andesite series were intruded by the granodiorite mass, after which the upper part of the Skamania series and the Columbia River basalts were extruded. Flows of the lower Skamania series appear to be "older" and have petrographic differences from the upper Skamania series. This particular problem is discussed at some length in his paper entitled "Keechelus Andesitic Lava Flows of Washington in Southward Extension".

The granodiorite stock that measures 10 miles by $1\frac{1}{2}$ - $2\frac{1}{2}$ miles in areal extent probably was emplaced by stoping; that is, fusing its way upward. Wall rocks of andesitic composition were absorbed by the magma, causing the granitoid rock near the margins to approach augite diorite and quartz diorite in composition. Zenoliths (portions of wall rock that broke away and floated in the magma something like icebergs in the ocean) show evidence of resorbtion, - further pointing toward stoping and assimilation as the method of magma emplacement. The granodiorite shows development of flow layers arching toward the center of the stock, and joint systems that parallel the N.20° E.-trending long axis.

Hydrothermal (hot water) action is noticeable in both intrusive and in wall rocks and is evidenced by: (1) quartz-sulfide veins carrying small amounts of gold; (2) development of tourmaline crystals; (3) silicification and orthoclasization of certain areas. In the first year of its existence, the G.S.O.C. made a trip to one of the gold mines of the area, and on one of the trips led by Claire P. Holdredge it will be remembered that a stop was made at a Lewis River placer property.

Mr. Felts develops the ideas and reasons that confirm the above statements and his article should be read by those who are interested in more complete details. His maps, although the reproductions are small, are a real contribution to the geologic mapping of the Columbia River drainage area.

(March 23, 1940. RCT)

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DINOSAUR MUMMY

A partial "dinosaur mummy" - one of about 10 fossils of these giant reptiles in existence in which the print of the skin is preserved over the bones - is now being studied by Smithsonian Institution paleontologists. This fossil was found in the Red Deer River country in Alberta, a famous dinosaur quarry, and was obtained by the Smithsonian from the Ontario Museum in Toronto.

The outstanding "mummy" of all, says Dr. Charles W. Gilmore, curator of vertebrate paleontology, is one now in the Museum of Natural History, New York, on which is an impression of nearly two-thirds of the skin. Others, scattered throughout the country, show only small skin patches.

Only under the most exceptional conditions of fossilization, Dr. Gilmore points out, would any trace of the skin, however tough it may have been in life, be preserved. It would naturally decay very quickly after the death of the animal. Only the hard parts of the body, bones and teeth, ordinarily are turned to stone and resist the ravages of time over such a vast span of time as 95,000,000 years.

The specimen now being studied at the Smithsonian was one of the fantastic "duck-bills", among the latest and most highly specialized of the dinosaurs. The impressions of those patches of skin which remain, including the covering of several of the tail vertebrae, are very clear and give a good idea of what the creature must have looked like in life. The skin was covered with horny nodules, rather than the overlapping scales characteristic of many of the present-day reptiles. It was an armorlike hide, approximately a sixteenth of an inch thick, and probably would have made excellent leather.

Another curious feature of this specimen found by Dr. Gilmore is the fact that some of the muscles of its back apparently turned to bone before its death. Presumably the specimen was an old animal, and these "ossified tendons" must have been a considerable handicap to it. The same condition is sometimes found today in old turkeys.

The skin patches in the present specimen are fairly well distributed over bones of different parts of the monster's body, Dr. Gilmore points out. This gives an excellent opportunity for studying the appearance of the creature as a whole as it wallowed about Canadian swamps at least 95,000,000 years ago.

- Smithsonian Institution.

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Raymond L. Baldwin
344 U. S. Court House
Portland, Oregon

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)

do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
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Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

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Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday Sept.19 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN 4th floor Central Building, 10th Ave. between Alder and Washington.

Thursday Sept.26 — Noonday luncheon at THE ORANGE LANTERN.

Friday Sept.27 — Subject: MINERAL CRYSTALS.
Speaker: Dr. William Colburn.
As curator of the department of geology and mineralogy in Cranbrook Institute of Science, Bloomfield Hills, Michigan, Dr. Colburn brings to us a wealth of experience in the study of minerals and their crystal form. The lecture will be illustrated with slides in color. Dr. Colburn will also discuss methods of preparation and care of mineral collections.

Sunday Sept 29 — THE LEWIS RIVER REGION IN WASHINGTON. This trip will include portions of the trip made to Christmas Canyon in 1935, with the lava tunnels at Ole Peterson's as the main goal. Caravan will leave SW Front and Yamhill St. at 8:30 a.m. Proceed via Vancouver, Battle Ground, Heisson, Amboy, Yale and Cougar to Christmas Canyon. Here is a most spectacular example of erosion, which occurred between dusk and dawn of a single night.

Lunch will be eaten at the forest camp grounds between Christmas Canyon and Ole Peterson's ranch.

Following lunch the caravan will go to Peterson's ranch, from which the trail leaves for the cave (about 1¼ mile hike). The lava flow in which the lava tube or tunnel is formed came from Mt.St.Helens and is a pahoehoe type. A most striking feature of its surface is the pressure ridges and fissures. The flow is recent, and large trees stood in its path. These are preserved as molds. The open portion of the tunnel is probably 3/4 of a mile in length. Wear old clothing and stout shoes - four miles of hiking. Round trip about 120 miles. A. D. Vance, leader. BRING YOUR FLASH LIGHTS.

Thursday Oct. 3 — Luncheon at The Orange Lantern.

Thursday Oct.10 — Luncheon at The Orange Lantern.

Friday Oct.11 — Mr. Jack Dement, a research student, will tell us about some phases of radioactivity in minerals.

Sunday Oct.13 — LINCOLN BEACH TRIP. A fossil locality which needs exploring. Those who have Saturday will do well to plan on spending the two days here. Many good auto camps are available. More details later.

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Geology and Engineering, by Robert F. Legett. McGraw-Hill Co., 650 pp., 6x9, 224 illustrations, 1939. $4.50.

Mr. Leggett is Assistant Professor of Civil Engineering at the University of Toronto, and is experienced both as an engineer and as a geologist. He has written this book not to train the reader as an engineer or geologist, but to show principally the close relation between the two professions and the necessity for the engineer to have sufficient geological training to know when an expert geologist should be consulted.

The first part of the book is an introduction to geology covering the history of the science with chapters on the composition and structure of the earth's crust. A chapter is given to geological field work and mapping and the interpretation of geological maps.

Part two covers geology as applied to civil engineering and has separate chapters on the different phases of engineering work, with examples of applied practice and the geological work associated. Cascade and Ruckel slides at Bonneville and the use of the frozen arch dam in the mud flow at Grand Coulee are treated in some detail both in the text and illustrations. Owyhee dam gets attention for its geology and construction due principally to the fact that it is constructed over a fault. One of our members, J. C. Stevens, is quoted on percentages of storage lost due to silting.

Part three deals principally with materials of construction, soils and soil mechanics. It ends with a glossary and a bibliography and is well indexed.

One quotation from Sir Walter Scott's "St. Ronan's Well" applies quite well to our society: "--- and then some rin up hill and down dale, knapping the chucky stanes to pieces wi' hammers, like sae mony road makers run daft - they say it is to sae how the world was made".

This book is a very desirable addition to any engineer's or geologist's library.

- Tracy Wade.

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In our last bulletin we stated that Dr. Hodge's course in Geology would start on September 29. This was in error. We quote from the latest issue of the bulletin of the Oregon State system of higher education:

G 201p, 202p. General Geology. Three terms, 2 hours each term.
An introductory course dealing with the processes at work changing the face of the earth; the internal structure, composition, and acitivities of the earth; the economic geologic deposits; a survey of the main events in the history of the earth; and a study of prehistoric life, including geological backgrounds of man and current events. Thursday, 7:15, room 111.

Bac 350p. Public Health. Fall term, 2 hours. Dr. Weinzirl.
A general survey of personal and community hygiene. Some of the topics to be considered will be: vaccines, bacterins, toxins, serums, desensitization, specific medicine, surgery, and food factors; carriers of disease, cleanliness, isolation, disinfection, epidemiology, temperature, humidity, ventilation, lighting, clothing, exercise; public health organization and legislation, eugenics; maternity, infant, pre-school, occupational, and old-age hygiene. Friday, 7:15, room 104.

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LABOR DAY WEEK-END TRIP

Over the Labor Day week-end, August 31st through September 1st, members of the G.S.O.C. participated as guests in a jaunt arranged by The Oregon Section of the American Institute of Mining and Metallurgical Engineers to visit mining operations in southern Oregon.

The party assembled first at the Bonanza Mine, 6 miles east of Sutherlin at about 12:30 p.m. Saturday. Here the group was welcomed by Mr. H. C. Wilmot, general manager, and guided to the pleasant screened porch of a near-by house, where a long table had been arranged for serving luncheon. Mrs. Wilmot, assisted by ladies of the camp, served sandwiches, salad, iced melon and coffee. There is no doubt that everybody enjoyed the delicious food; not only was it most appetizing, but many of us had breakfasted early in Portland, and the 190-mile drive had created an appetite that correlated perfectly (geologically speaking) with Mrs. Wilmot's menu.

During the afternoon the members were taken underground and also guided through the furnace plant. To many of the group the various operations seen were novel and of great interest. The Bonanza is at the present time the largest quicksilver producer in the United States. Its hold on first place will be strengthened when the third furnace now being installed is put into production. We saw that mining, conducted properly as it is at the Bonanza, is not haphazard digging underground, but is a carefully planned, coordinated operation in which the application of engineering and geology is essential to its success.

Saturday evening the party gathered for dinner at the Hotel Umpqua, Roseburg, with 45 people present. After dinner Mr. S. H. Williston, chairman of the Oregon Section, introduced three speakers: Mr. Albert Burch, consulting engineer of the Benton Mine, which the group was to visit the next day, spoke interestingly on the history of the mine and described the vein system and methods of exploration; Mr. F. S. Bristol, owner of the only silica quarry, discussed nonmetallics in southern Oregon, a subject which will become increasingly important as industries are established in the lower Columbia River basin. The last speaker was Mr. H. C. Wilmot, who talked informally of Bonanza operations and answered various questions. His story of his company's acquisition of the property and anecdotes of selling his production were especially interesting.

On Sunday morning at 8:00 o'clock the group left Roseburg and drove south to Glendale. From Glendale the caravan traversed a steep, narrow mountain road for 24 miles over Mt. Reuben to the Benton Mine. The writer is tempted to pause a bit and assemble a few superlatives, descriptive of the road, the topography, and the scenery, but space does not permit; moreover, word description of mountain scenery should be attempted if at all only by the elect, and then probably only after fasting and prayer.

At the Benton Mine the party was received by members of the mine staff, headed by Mr. Mason Bingham, of the Lewis Investment Company, owner of the property. First those interested were shown the cyanide mill, and then all were invited to a meal in the mine boarding house. This was certainly enjoyed by everybody, and speaking of superlatives, there was made once upon a time a perfect apple pie. Believe it or not, on that occasion the Benton Mine cook was the close runner-up.

During the afternoon the group was guided underground. Those who could climb ladders were shown through the stopes and other underground openings. Apparently this was found highly interesting to all, and because of Mr. Burch's talk the night before and Mr. Youngberg's explanations underground, the interpretation of the vein system was simplified. The white quartz veins showed up plainly in contrast to the disseminated ore of the Bonanza mine, difficult to distinguish underground.

In due course the group started on its way to Grants Pass over a comparatively new road which led down into the valley of the Rogue River and on up to Galice. It may be remarked in passing that the Rogue River canyon presents some grand vistas, especially from the high points of the road leading down off Mt. Reuben.

The dinner at the Del Rogue Hotel at Grants Pass was attended by 53 people. If the writer had not run out of adjectives (as applied to food) he might speak of the fried chicken, but let is pass. The after-dinner program had been planned by the Oregon Mining Association, and Mr. Williston turned the meeting over to Mr. D. Ford McCormick, a director of the Association. Mr. McCormick outlined some of the problems of the state's mining industry and called on Mr. F. Whalley Watson, who sketched the history and activities of the Association. Mr. Williston then gave an outline of excess profits tax legislation, now before Congress, pointing out that if enacted in its present form it would entirely prevent new strategic minerals projects which the Government wishes to encourage. Mr. F. I. Bristol spoke of transportation problems of the small mine operator, especially the restrictive P.U.C. laws governing truck hauls of mineral products. Senator Wipperman discussed the Rogue River muddy water problem and stressed the need of continuing the Rogue River Co-ordination Board as the most satisfactory method of settling the old controvery between miners and fishermen. The talks were given very close attention and G.S.O.C. members appeared to enjoy the several discussions even though some of the subjects were new to them and not related to geology.

On the following morning, Labor Day, most G.S.O.C. members left Grants Pass early under the leadership of John Allen to go to Crater Lake, from which they returned to Portland by way of the new Willamette Highway. Al Vance described this section of the trip at the following luncheon and it must have been a most enjoyable one.

Excepting Mr. and Mrs. Schminky and Carol Ann, who returned to Portland from Grants Pass, those who did not go to Crater Lake joined the group of mining people to visit dredge operations in the Grants Pass area. G.S.O.C. members in this group were Mr. and Mrs. Simon, Lotus Simon, Miss Hughes, Ray Treasher and the writer. Most time was spent at the Atlas dredge on Althouse creek, a short distance from Holland. This is the largest dragline in the state. The bucket has a capacity of 5 cubic yards and weighs (empty) seven tons. The unit is of the Monighan type, is Diesel electric operated with Ward Leonard controls, weighs 190 tons, and has a "walking" traction. The group was much interested to see the unit "walk" to a new location. Mr. Frank Ford, president of the Atlas Company, guided the group over the operation and kindly explained all details.

Next the Crescent Pacific dragline dredge on the Applegate River was visited. This was shut down over Labor Day, but the watchman started up the washing plant to show the operation of the four Ainsley bowls used for amalgamation and the facility with which they are cleaned. An interesting feature

of this operation is that resoiling of some of the land is done so that the land after dredging returned to the farmer owners in shape for continued farm use.

The party stopped to look at the Hayfork dredge on Forest Creek near Ruch. Here the dragline was being used for stripping barren overburden preparatory to digging the gold-bearing gravel beneath.

Then into Jacksonville, where under the guidance of Ray Treasher this cradle of Oregon mining was visited. Several old buildings built in the early 1850's were seen; especially interesting was the large display of antique objects, many of them of historical interest, in the museum housed in one of the old buildings.

The objects of historical interest in Jacksonville, founded in 1852, particularly the museum which contains many things intimately connected with the start of Oregon mining, warrant the attention of citizens of the state. The impression gained in visiting the town is that there is a serious neglect of the historical value of the place. Explanatory plaques should be placed at various points, and certainly the museum rates better housing, and a great deal more in the way of publicity.

The final leg of the trip was up Foot's creek to the Murphy Murray bucket line dredge. It was too late in the day to do more than view it from the car. From here Mr. Simon's party departed on its way to Crater Lake. The rest of us returned to Grants Pass.

In conclusion a word of thanks and appreciation to Ray Treasher, who together with Al Lewis made the arrangements for the southern Oregon trip. The timing was all that could be asked for, and all other details were carefully planned.

- F. W. Libbey

****

NEW MEMBER

Miss Abigail Neikirk	5231 SE. Lincoln	LA 8961

CHANGES OF ADDRESS

Miss Eva Catlin	4019 S. D. Street, Tacoma, Wash.
Mrs. H. Mildred Stockwell	694 N. Church St., Salem, Oregon.
Mr. and Mrs. Paul W. Howell	4513 - 12th Ave., NE., Seattle, Wash.

The following paragraph appeared in the Journal Junior section of the Oregon Journal, Tuesday, September 17, under the caption "Mineral Club Session": "Specimens of gold-bearing ore in pyrite form from the Benton Mine in Josephine County were given members. The Benton Mine is rated as Oregon's best little mine. The ore was presented to the club by the Geological Society of the Oregon Country, E. Bruce Schminky, representative."

Through the courtesy of State of Washington Department of Conservation and Development the following bulletin and map have been added to our library:

Bulletin No.32 "The Geology of Washington, Part 1, General Features of Washington Geology", accompanied by the preliminary geologic map, 1936.

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Portland, September 21, 1940.

Dear Jim:

A lot of territory had been covered since my last letter (about 2000 miles) and consequently my writing may be a bit erratic as I shall jump from spot to spot as memory serves.

First of all I'll tell you about the last two luncheons. One of them I didn't attend but have some information about the specimens shown in which I imagine you may be interested. At that luncheon John Allen showed a shell-marl from Butte Creek east of Scott's Mills; some Oligocene fossils from the same locality and from there as well a specimen of charcoal in tuff. Mr. Hancock had a fossil mastodon tusk from Roads End Beach. That man could find an elephant in your backyard, I do believe. Dr. Booth showed a specimen of alanite (CaCeDeAl) from the Black Hills of South Dakota. There have been a number of specimens from that region and all we have to show from the same locality is an ordinary rock from Calamity Jane's grave. He also had a saber tooth tiger skull from there.

This week I attended the luncheon and felt at home again. By being on our vacation we missed Mr. Stanley's lecture on Alaska at the regular meeting and this we sincerely regretted as he is ever interesting.

On our trip we visited the John Day fossil beds out of Dayville and proudly brought home what we thought was a fossil but -- 'tis only recent; and, while the first concensus of opinion was "jackrabbit", Mr. Simon and Mr. Hancock are torn between beaver and porcupine. Why either one should have been up in that green calcareous deposit as barren as it is no one seems to know.

Dr. Booth had some specimens from Ivigtut, Greenland, which he had obtained while in Philadelphia. They were all non-fluorescent but interesting nevertheless. These specimens consisted of Ivigtite, a hydro-mica of zinc cryolite - this is a coating or alteration process at edge of cryolite deposits and has specks of pyrite; Chiolite, in association with cryolite but very rare - this is chemically like cryolite, but different crystallization; Cryolite, a fluoride of Na and Al used as a flux in the electrolytic process for the production of aluminum; and a specimen of Barite in which the fine white crystals are Thomsenolite and the black specks pyrite. The specimen of Barite brought the statement from Clair Holdredge that it is used in oil drilling to a great extent; so then Dr. Booth added that stomach trouble patients should remember their barium meal.

Mr. Piper produced specimens of shells from the late Pleistocene from the marine deposits of southern California. They were most delicate in form and pastel colored. Rather a change from the rather massive forms I ordinarily associate with fossils - at least all those I've seen.

Mr. Vance had some oil sand from Utah. That is the second specimen shown at the luncheon so I guess there is still oil under the surface outside of Oklahoma and California.

While on our trip we were in the region around Clarno, Fossil, and Antelope, and while that is a wide open territory it is a wonder we didn't meet some of the others. Clair Holdredge was in the vicinity and was almost in the cloudburst in region. We were in the thunderstorm too and had to do some fording but missed the worst part. Mr. Holdredge said it was just a very hard rain but on his return through the region he said it was notable to see in such an arid region

how much erosion could be accomplished by the tools of a hard rain. Tom Carney was also in the section and, trying to get beyond the worked-over area, hiked back six or seven miles in the hills and found a massive and extraordinary specimen of replacement. This consisted of a very large group of natrolite crystals pseudomorphed and replaced with agate. The usual replacement would be quartz or garnet.

I told about the large rattlesnake we saw and this brought on several snake stories. Mr. Schminky said that in twenty years exploring in central and eastern Oregon he saw his first one on the last field trip in the Warm Springs region. Dr. Booth's dog was bitten by one last week but on last report had completely recovered. I'll have to admit we saw ours in Nevada and not Oregon.

By the time we reached Portland the back end of the car was weighed down with rocks in addition to our baggage and while we may not have anything important in the eyes of the advanced collectors or professionals, we at least have some "pretty" rocks and may find use for them eventually - at least we got a lot of exercise.

I notice in the Portland Extension Bulletin that in addition to Dr. Hodge teaching geology, another member of the Society, Dr. Weinzirl, is to teach a class in Public Health.

Mr. and Mrs. Richards have moved to Salem where Mr. Richards is now employed, and I know everyone will miss them.

Will tell you more about our trip at a later date.

Katie.

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WATER-SUPPLY Paper 841. Geology and ground-water resources of the Harney Basin, Oregon, by A. M. Piper, T. W. Robinson, and C. F. Park, Jr., with a statement on precipitation and tree growth, by L. T. Jessup. 1939 (1940). vi, 189 pp., 20 pls., 9 figs. Price $1.

The Harney Basin, Oregon, covers about 5300 square miles on the relatively high, semiarid volcanic plateau that forms the southeastern part of the state. It constitutes the drainage area of the Malheur and Harney Lakes, which have no outlet to the sea. The basin includes (1) a low central area of playasand lake beds, alluvial plains some 800 square miles in extent, cinder cones, and lava fields and (2) a higher marginal area that comprises erosion plains of intermediate altitude and a dissected upland eroded from a fault-block terrane. The central lowland is about 4,100 feet above sea level; the highest peak on the upland is about 9600 feet. Because of the average yearly rainfall is only about 7.8 inches, the yearly mean temperature 44.6°F., and markets relatively remote, the hardy cereals and forage are the most suitable lowland crops. In growing such crops, irrigation from wells has proved advantageous and economically possible. This report discusses the feasibility of more extensive withdrawal of ground water for irrigation and other uses within the basin. It describes the geologic features which determine the availability of the water. It also describes the sources and movement of the several bodies of ground water and as far as possible gives an estimate of the quantity of water available. The report is based on an investigation made in cooperation with the Oregon Agricultural Experiment Station, Department of Soils.

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CINNABAR MINES FIELD TRIP.

Cinnabar mines in the Mt.Hood National Forest southeast of Estacada were visited July 14th on a field trip by members of the Geological Society of the Oregon Country, under the leadership of H. B. Wood. These are in an area adjacent to the Oak Grove Fork of the Clackamas River, near Mt.Mitchell. The route into the district from Estacada was over the converted railroad used by the Portland Electric Power Company during and after the construction of the Oak Grove Dam and the Three Lynx Power Plant.

Only one stop was made in the Clackamas River Canyon on the way to the mining district. This was to observe a petrified tree standing upright in a road cut. The tree was rooted in sandy tuff of the Eagle Creek formation, where it apparently was growing when the Columbia River basalts engulfed it. Pillowy structure of the lava and the alteration of the formational contact indicates the lava either flowed into water or on to a very wet surface. The tree is unusual because of its extension well up into the lava flow, its upright position and its excellent preservation.

A short distance farther the caravan passed Three Lynx and the electric power plant. Beyond the power plant the road parallels the big pipe line, which carries the water from the reservoir to the generating plant. On the right bank of the river, between Three Lynx and the Oak Grove Fork, are several square miles of landslide area caused by the Columbia basalt sliding on the weaker Eagle Creek and Bull Creek formations.

For the lunch period the group left the main road at the Oak Grove Ranger Station and drove down to the Rippling Springs Forest Camp beside the Oak Grove Fork.

After lunch the group drove a short distance farther up the river, where three mines were visited. The district has a general elevation of about 2,000 feet. Numerous stakes marking the various mining claims were noted and mineralized areas were frequent. Most of the cinnabar in the area is associated with calcite and some mineral collectors have given the ore a variety name of "Bartonite". A zeolite, tentatively identified as stilbite, is a common gangue mineral in the cinnabar ore. Tunnels and surface workings were inspected at each mine to see the ore in place. Mr. Wood, leader of the trip, carried a prospector's gold pan and washed some of the cinnabar to show one method of determining the value of the ore.

The first mine, that of Ames and Kiggins, was of special geologic interest. The party descended over the edge of a landslide bench on the north bank of the river and across the narrow inner canyon to a small bench on the south side. The country rock is Columbia River basalt in which the Oak Grove Fork has at times followed the fracture systems of the rock. One of the veins crosses the stream diagonally and is worked during the season of low water when the entire flow of the upper river is diverted for power use. This same vein can be traced several hundred feet up the side of the canyon. "Specimen grabbers" secured nice samples of calcite layered with cinnabar from the tunnels, open cuts and ore dumps. Quicksilver recovery was by furnace and retort ingeniously located in the fractures and natural channels of the basalt.

To reach the second mine, now abandoned, it was necessary to make a steep climb part way up the south side of the canyon. This is known as the Southwest Smelting Company mine. Both tunnels are short with vein material exposed in the face of one. The country rock is hydrothermally altered and oxidized basalt.

No cinnabar was visible in the ore; however, samples panned by Mr. Wood showed considerable color.

The mine of the Oregon Quicksilver Mining Company, the last one visited, has been in active operation since early summer. An average of one flask of quicksilver per day is produced. Mr. Watkins, the superintendent, greeted the group and showed the seams of cinnabar in the tunnels, located at two different levels on the hillside. This mine is lighted by electricity. Supplies are transported from the road high on the north bank by an aerial tramway.

Besides many nice cinnabar and zeolite specimens secured by different members of the party, Mr. H. B. Schminky found a splendid specimen of dog-tooth spar (calcite).

Four years ago, on August 23, 1936, the Society made a trip up the Clackamas River Canyon, using the speeders of the Portland Electric Power Company. Numerous stops were made to study the geology and the open cars afforded a fine opportunity to see everything of interest. Ray C. Treasher and Clarence D. Phillips wrote reports of the trip, which were published in the Society's Bulletin, Volume 2, no. 19, October 10, 1936. Mr. Phillips quoted from the geological studies of the region by J. S. Diller and Ira A. Williams. The speeder trakcs have since been removed and the roadbed has been made into a fairly good automobile road which connects into the road to High Rock and Squaw Mountain.

- E. M. Barr

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IDENTIFICATION OF MINERALS

What are psilomelane and limonite? What are the distinguishing features of cinnabar and hematite? of chromite and manganite? What are the differences between graphite and molybdenite? What minerals have commercial possibilities?

These questions are readily answered in "Field Identification of Minerals for Oregon Prospectors and Collectors", bulletin 16 of the State Department of Geology and Mineral Industries, compiled by Ray C. Treasher. It is designed to be an elementary reference book containing as far as possible the essentials of field identification of minerals by simple physical means only.

A mineral is defined as a "natural inorganic substance which, when pure, has a definite chemical composition, usually a definite crystal form and specific physical properties such as cleavage, fracture, color, hardness, luster, and specific gravity". This bulletin is concerned chiefly with these physical properties. Chemical and blowpipe tests are omitted because they require equipment seldom with the prospector in the field. Prospectors, collectors and recreationists will find this bulletin contains information each desires.

Copies of "Field Identification of Minerals", Bulletin 16, may be purchased for 50¢ at the State Assay Laboratories at Baker and Grants Pass, and at the Portland office.

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GEOLOGICAL NEWS LETTER

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THE GEOLOGICAL NEWS-LETTER

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday Oct.10 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Oct.11 — Subject: RADIOACTIVITY AND FLUORESCENCE IN MINERALS.
Speaker: Jack Dement
With a background of 10 years of private research in radio-activity, Mr. Dement is well qualified to discuss a subject of which so little is generally known. He will tell us something of uranium and its remarkable isotope, U-235, which many think will some day be a common source of power.
As a special attraction, Dr. C. L. Booth will exhibit some of the beautiful fluorescent minerals collected by him in the East last summer.

Sunday Oct.13 — Lincoln Beach Trip. This is an interesting section of the Oregon Coast, which has been neglected on past society trips.
There is a fossil-bearing section about one-fourth of a mile in length, which seems to contain the same types of marine life found at Spencer Creek, south of Otter Rock. Agates, jasper, fossil wood and whalebone, and zeolites are found on the beach when the sand has been carried away by storms. Structural features of the vicinity are quite interesting. Those who can go Saturday will find several good auto camps available, with rates from one dollar up. The road to the fossil locality turns west from the main highway at the highway stock pile about one-half mile south of the central section of Lincoln Beach, or about a block south of the Reid Auto Camp. If this road is muddy, the cars will be left at the stockpile. The round trip will cover about 200 miles.

Thursday Oct.17 — Luncheon - Orange Lantern.

Thursday Oct.24 — Luncheon - Orange Lantern.

Friday Oct.25 — Subject: THE CHEMICAL STORY OF ALUMINUM.
Speaker: Dr. O. F. Stafford, University of Oregon.
This is our opportunity to learn something of the fascinating chemical and metallurgical history back of every bart of aluminum, a mineral as essential to national defense as it is to the preparation of Sunday dinner. The Portland area is in line to become the center of production of this strategic mineral, and it behooves us all to learn something of its chemical nature.

Thursday Oct.31 — Luncheon - Orange Lantern.

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CHANGE OF ADDRESS

Mrs. and Mrs. Carl P. Richards, 31 Roberts Apts.; 157 Winter St.,Salem, Ore.

***

DOINGS OF OUR MEMBERS

Mr. Franklin Davis was down from the Capitol Wednesday and expressed regret that he could not stay over for the Thursday luncheon. He said that Mr. and Mrs. Ormand R. Bean and members of the Geological Society of the Oregon Country living in Salem were entertained Tuesday evening at the Davis home.

Dr. Courtland Booth was the principal speaker at the meeting of the Oregon Agate & Mineral Society, Friday evening, October 4th.

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We are revising our mailing list, and in the near future we will publish this as a supplement to the bulletin. As careful as we can be with this list, when our Social Committee has occasion to use it, they always find errors. Who is to blame for this ! ! ! The suggestion to compile a revised directory was made by Mrs. Emily Moltzner, who has kindly offered to do the work. We would ask those members who have recently had a change in telephone number, or if you have any reason to believe we do not have your correct mailing address, to notify us at once.

****

Nelson, Richard N., and
Achenck, Hubert G.

CALCAREOUS ALGAE IN PACIFIC COAST LIMESTONES
Geological Society of America, Bulletin no.39, page 266.

The presence of LITHOTHAMNION in a Quaternary formation on San Clemente Island has been reported by W. S. Tangier Smith (1896) and calcareous algae were noted by Diller (1901) in an Oregon Eocene limestone. LITHOTHAMNION is recognized also in Eocene limestones of the Santa Ynez Mountains, California, and near Dallas, Oregon. Boulders of similar limestone have been collected from the conglomerates of the Sespe and Pico formations of the Ventura district, California.

In a discussion of the morphology of the fossil forms, it is shown that fragments of the thallus are preserved, and that conceptacles for reproductive bodies may be distinguished.

Recent red algae are important reef-builders. If modern views are accepted, most of them are limited, while living, to shallow water. This, together with other evidence, points to the conclusion that the Eocene limestones containing these calcareous algae were deposited in warm shallow water.

- R.C.T.

****

SOME FEATURES OF LAKE OCCUPATION IN THE KLAMATH REGION

by Paul W. Howell

Foreword:

This paper on the geology of the Klamath region in south-central Oregon does not purport to be comprehensive, but presents some of the evidence of lake occupation during late Tertiary time. Most statements herein are backed by systematic observations, but many inferences have been drawn and the worth of these must be judged by future investigators.

I am indebted to R. J. Russell, B. N. Moore, and D. W. Johnson, whose writings on the Klamath region I found most instructive. I am also indebted to John C. Cleghorn of Klamath Falls, who helped me with automobile trips and with good advice; and to Clyde Van Meter of Malin, who gave me free access to his well logs and a wealth of interesting information about the Klamath region.

* * * * *

Throughout central and eastern Oregon, investigators have found evidence of extensive lakes that existed in middle Miocene time. This lacustrine period is well shown in the Klamath region by lake sediments, which are mainly even-bedded waterlaid pyroclastics and diatomaceous earth. There are, in addition, numerous beds of conglomerate and cross-bedded sandstone, which indicate that streams also played an active part in the deposition of materials. Since these sediments were laid down, extensive faults have so displaced the rocks of the region that correlation of the various beds is extremely difficult. Furthermore, there are indications that certain lakes never went entirely dry, so that here and there sediments were deposited without the usual interlayering of lavas. Thus, at a few localities one may find lake sediments in diminishing stages of consolidation, interrupted only by periods of faulting and slight erosion.

The older lake deposits are best exposed just east of Klamath Falls, where they are uplifted at sharp angles and their erosional remnants form a group of sharp hills topped here and there by basalt dikes and necks. The writer concurs with R. J. Russell in the inference that these hills were never completely covered by the basalt lavas of the following period. These older sediments also crop out extensively along the foot of Hogback Point and of Plum Ridge at Algoma, throughout Yonna and Langell valleys, in Sprague River valley, and at many other places. Thick conglomerate occurs along the west side of the first draw west of Klamath Falls.

Hydrothermal action, accompanying the faulting and volcanic action at the close of the lacustrine period, has greatly altered some of these older sediments This is clearly shown around Klamath Falls, especially in the so-called "Geyser Basin" which lies just northeast of the city limits. This was once an area of considerable hot spring action, and beautiful variegated chalcedony and sinter are present in great quantity. Some of the old hot-spring basins have not been modified in form, although activity has long since ceased. In this vicinity well preserved fossils are found in the flint-like altered diatomite. This hot spring area was dislocated by faulting, and a small part of the deposits may be seen hanging on the brow of the ridge to the east. Hot springs are still numerous in the Klamath region, and alteration of the surrounding rocks is undoubtedly going on at a somewhat abated pace. Natural hot water wells are much in use in the town of Klamath Falls.

Exposures showing successive depositions, with fault interruptions, may be observed in several gravel pits in sec.5, T.40 S., R.10 E., at the foot of Stukel Mountain; in the county pit at the top of the ridge in sec.10, T.41 S., R.10 E., and in an old road bed near the south end of Lower Klamath Lake, approximately in sec.10, T.47 S., R.2 E.

Fossil localities in these older lake sediments are quite plentiful. The fossils are mostly shells of fresh-water molluscs and skeletons of fish, but occasional fossils of plants and of mammals have been found. Numerous localities have been found by the writer and by other interested persons: those visited by the writer are as follows:

1. In the SW¼ sec.27, T.37 S., R.11½ E.; a creek bank 500 feet east of the John Bodnar house. Fresh-water molluscs.
2. Approximately on the east line of sec.25, T.37 S., R.11½ E.; in a county road cut. Fresh-water molluscs and fish skeletons.
3. In the SW¼ sec.17, T.38 S., R.9 E.; on the upper side of the old Klamath Market road just north of the divide between Jack Rabbit Flat and Pelican City. Fresh-water molluscs and fish skeletons.
4. In the SW¼ sec.20, T.38 S., R.9 E.; in the first highway cut south of the overcrossing of U.S.97 at the north edge of Klamath Falls. Plant fossils.
5. In the NW¼ sec.3, T.41 S., R.8 E.; at the north end of the first railroad cut south of Worden. Fresh-water molluscs and fish skeletons.
6. In the NW¼ sec.16, T.47 S., R.3 E.; in an outcrop of sandstone 60 feet west of the road and on the old beach line about 0.6 road mile southwest of the meander corner common to sections 9 and 16. Fresh-water molluscs and tree branches.
7. In the N½ sec.26, T.47 S., R.5 E.; in the gravel pit north of the railroad and highway. Recent fresh-water molluscs.
8. In the NW¼ sec.32, T.39 S., R.10 E.; in the county gravel pit at the north end of Stukel Mountain. Section of an unidentified skull with several teeth intact was found here by the county road crew. This section of skull is on display at the Klamath Falls Chamber of Commerce.

Between this early lake era and the present lake era there intervened an epoch of volcanism and of faulting on a grand scale. At this time the Basin-Range Province, of which southeastern Oregon is a part, was formed. Preceded and accompanied by violent volcanic eruptions, blocks of the earth's crust, some of them many miles in extent, were displaced thousands of feet. In the Klamath region, as elsewhere, this faulting almost completely rearranged the drainage pattern: streams were forced into new channels, new lakes were formed, and other lakes were drained. Streams and lakes were choked with volcanic dust and fragments. Fish and animals died by the thousands or fled and the land became as bare of foliage as the great Sahara.

The general trend of faulting in the Klamath region is northwestward as far as Modoc Point, where the main faults swing sharply to the east, and thence almost due north. There are exceptions, such as the Fort Klamath scarp, which maintains the northwestward trend and forms the east wall of the Klamath graben. The scarps that bound this graben rise several hundred feet above the floor on which are cradled Upper Klamath Lake and Agency Lake. This graben continues on south from Klamath Falls, but gradually diminishes in displacement until it is quite inconspicuous at the margin of the Modoc Lava Beds.

The lack of extensive erosion on the scarps indicates that the Klamath graben is young as a topographic form, yet much has happened since its creation. Early in its history, the graben and many of those adjoining were occupied by one vast lake whose surface was broken only by the higher ridges. With transit and aneroid barometer the writer has roughly checked the old lake level by observations on the old benches. The highest of these benches is approximately 4,700 feet above the sea, or about 600 feet above the present lakes. These high benches may be seen at the south end of Plum Ridge, on Horton Hill in Poe Valley, at the north end of Stukel Mountain. Along the west side of the latter mountain the bench continues at variable heights to the south end of the mountain where it may be plainly observed that wave action has cut into the consolidated clastic rocks. Since there is now no barrier at the south end of the region which could have impounded water so high, it must be assumed that a former barrier has been depressed relatively. If so, it is entirely probable that movement may have raised these old benches. Warping may account for the uneven height of the bench along the west side of Stukel Mountain.

The relative subsidence of the area to the south was apparently fairly rapid and continuous until that area reached an elevation of approximately 4,300 feet; no benches or other evidence has been found to suggest an intermediate period of rest. Subsequent lowering of the lake level has been due almost entirely to down cutting of the outlet by stream action.

From the vicinity of Chiloquin a vast delta stretches out into the Klamath graben. A large part of this delta was built when the water stood at elevation 4,300 feet or higher. This delta extends roughly from Modoc Point on the south to Klamath Agency on the north, and from Chiloquin on the east to a point very nearly across the Klamath graben, almost severing Agency Lake from Upper Klamath Lake. The new section of U.S.97, extending from Modoc Point to Klamath Agency, cuts through this delta material at numerous places. An elevation on top of this delta of 4,350 feet was checked by the writer at a point about 1,000 feet east of engineer's station 1455 + 00. At this point the delta deposit overlaps older tuffaceous sandstone. This delta was undoubtedly built by the Williamson and Sprague Rivers. It is composed mainly of fairly well consolidated fine gravels, but has many beds and lenses of volcanic ash and diatomaceous earth. Cross-bedding is prevalent. Northward from engineer's station 1470 + 00 nearly all the material is fine dark sand. The prevalence of cross-bedding here suggests that wind may have played a part in the structure of the deposits after the waters had receded. At present the delta is in a stage of mature discetion.

Another delta of large extent occurs on the west side of the Lost River Gap. At the approximate elevation of this delta there are wave-cut caves and a minor bench at thenorth end of Stukel Mountain. A bench mark at Olene gives to this delta an elevation of 4,150 feet, some 200 feet lower than the delta farther north at Chiloquin. Since this elevation is lower than the area to the south, it must have been formed during a temporary lull in the cutting of the present Klamath River outlet. This delta was quite extensive at one time, encompassing an area of about 20 square miles. At present it is in an advanced stage of dissection and its initial boundaries are somewhat obscure.

Unsubstantiated reports have it that an outlet once drained the Klamath basin by way of Tule Lake and the Pitt River. The writer has never been over the ground, but the Geological Survey reconnaissance topographic maps indicate that this is probable. These maps also indicate that still another outlet by way of Dorris would have been possible. The elevation of the lowest points in that area correspond roughly to the 4,350 feet elevation of the Chiloquin delta.

The present outlet of the Klamath basin is the Klamath River, which leaves the basin on its west side and travels in a southwesterly direction across the Cascade Range to the Pacific Ocean. This stream is in a youthful stage throughout most of its length and has cut rapidly headward into the Klamath basin, capturing the drainage of that area from the older outlet to the south. Just how it was able to cut through the immense barriers of basalt between Beswick and Keno to capture this drainage is a bit more than this writer can say. The inference drawn, however, is that the Klamath River system, previous to the subsidence of the area to the south of Klamath basin included Clear Creek. The only barrier between it and the Klamath basin, then, was the basaltic flows between Clear Creek and Keno. This barrier was so much narrower than the one south of Tule Lake that the Klamath River was able to cut through it before any considerable erosion had taken place in the outlet to the south.

An interesting sidelight on this later lake period is the evidence it presents on the eruption of Mt. Mazama. In the new highway cut just south of Klamath Agency a 5-foot layer of pumice overlies the old delta sands. A 20-foot auger test hole, put down by the state highway engineers near the railroad track on Shady Pine flat, reveals that thin layers of pumice exist at depths of 12 feet and 16 feet respectively. From this it would seem that there were at least two explosive eruptions of Mt. Mazama after the Chiloquin delta had been partially dissected.

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SALEM AND EOLA HILLS TRIP

On Sunday, July 28th, the members of the Geological Society of the Oregon Country were escorted on a trip through the environs of Salem under the co-leadership of Lloyd Ruff, W. A. Reeves, and F. L. Davis.

The object of the trip was to study the Oligocene formations through an inspection of the exposures containing fossils, to study the relation of the igneous and sedimentary rocks in this neighborhood, to check over erratics discovered in the territory and discuss their origin, and, lastly, to check the only two water gaps in the field below 200 feet elevation A.T., which give access to the Willamette Valley above Salem, the two gaps being, of course, the Willamette gap at Salem, and the Homes gap, now a wind gap.

The first point visited was a railroad cut on the Oregon Electric right-of-way near Finzer station, six miles south of Salem on the Independence road. At this point the type locality of the Illahe formation was pointed out on the old grounds of the Illahe golf course, which is now a private estate. The type locality is at approximately the same elevation, and same stratigraphic horizon across the small valley from the railroad cut which was inspected. Among the specimens collected were solons, yoldia, leda, agosoma, tellina and spisula. The manner of occurrence bore a decided resemblance to the formation at Pittsburgh Bluffs. In this connection, Dr. Thayer notes in his "Geology of the Salem Hills and the North Santiam River Basin, Oregon", that "as geological mapping of the Willamette Valley progresses, it may be advisable to drop the name 'Illahe' as a synonym for either the Eugene or Pittsburgh Bluffs formations."

It was here that Mr. Hancock who "missed the bus" caught up with the party and began making his usual lucky finds.

The group then proceeded south one-half mile to a location known as "Snug Harbor" adjoining the Willamette River. By means of concrete steps constructed on this property, which we were permitted to use through the courtesy of the owner, Dr. L. B. Thompson, we went down the bluff and crossed to an island in the river.

The island was entirely sedimentary and evidently the lower portion of the same deposit as that of Finzer Station but about fifty feet lower in the column. A large number of interesting finds were made at this spot which evidently has not been visited by geologists in search of fossils for some time. The specimens discovered were similar to those on the preceding stop, with the addition of the find of a few starfish fossils by Louis Oberson. These, as far as we have been able to discover, are the only specimens of that species to be located in the Oligocene of Oregon. Further investigation is being made to check this point.

The group had lunch at this sightly spot, after which Mr. Ruff discussed the formations visited during the morning and introductions of visitors were made. It was difficult to get the members started on their way because of the interesting features of the island, but this was finally accomplished after some strenuous whistle blowing. The party got under way, proceeding back to Salem, crossing the Willamette bridge at Center Street into Polk County, thence west on the Dallas road to Eola, four and a half miles west of Salem. A large erratic on the grounds of the Eola school was inspected and Mr. Davis discussed some of the local geological features. The members of the group then gathered on the lawn at the residence of Mr. and Mrs. F. L. Davis and listened to a talk by Mr. Ruff on the general stratigraphy of the district. Reference was made to the thesis of Mr. Maurice J. Mundorf,

on the Salem quadrangle, which was submitted to the Geology Department of Oregon State College for his Master's degree in 1939. This thesis was an excellent study of the district and was accompanied by colored maps. This study, as well as Dr. Thayer's "Geology of the Salem Hills", was referred to by Mr. Ruff in his discussion of the stratigraphy of the district. The lava, which is quite prominent in the Salem district, is believed to have come out upon the Western slopes of the Waldo Hills and to have flowed eastward over the Illahe formation. Colored maps and cross-sections brought this out in a very interesting manner.

The group then proceeded back to Kingwood Heights where a large erratic blasted out of the road was inspected. It was noted that the erratic was quite a bit smaller after the tour of inspection. At a sightly location on Kingwood Heights Mr. Ruff discussed the stratigraphy of the Willamette water gap, pointing out the similarity in the structure of the Salem Hills and the Eola Hills on opposite sides of the river.

The party then proceeded in a northwesterly direction, stopping to view more erratics on the way and passing over the high ridge of the Eola Hills at elevation 1000 to a point known as Rattlesnake Hill, where the group walked a short distance to examine some peculiar basaltic columnar formations. Owing to the symmetrical arrangement of these columns, many have thought them to be archaeological remains and a pit was noted where some one of an investigative turn of mind had endeavored to see what was below the ground. The group, however, felt convinced that the formations were only weathered basaltic columns, separated somewhat by hill creep or slumping.

The party continued down the western slope of the Eola Hills through Oak Grove and over the west side Pacific Highway to Holmes gap, which has an elevation of 166 A.T. Here again the formation of water gaps was considered. A suggestion was advanced that when the lava came out on the Waldo Hills, it blocked the Willamette River, which probably then flowed north through Holmes gap until it succeeded in cutting down the lava, and re-established its former course. Mr. Ruff discounted this theory because of the fact that Holmes gap and the bluffs on either side are entirely in the Oligocene sedimentary material, but all agreed that no doubt at some time there was a water course which had established this opening into the upper Willamette Valley and later abandoned it. Possibly the Rickreall may have at one time flowed north through this gap.

The party broke up at this point. All seemed to have enjoyed their visit to the Willamette Valley.

- F. L. Davis.

(Acknowledgment is here made of the assistance of Professor Clark of Willamette University and Glen Paxon, Assistant Engineer of the State Highway Commission, who assisted the co-leaders in logging the trip and furnished much information).

October 4, 1940.

Dear Jim:

Fall has arrived in Oregon, which means, in addition to the lovely foliage, rain. Rain, however, does not prohibit the field trips, meetings and luncheons of the G.S.O.C. and they go merrily on their way.

The last two luncheons have been extremely interesting from the European war outlook as a week ago Mr. Holdredge gave us some side lights on the Dakar campaign inasmuch as he had been in Dakar on two previous occasions and knew the geological outlook both from the terrain of the section and the economic viewpoint. Yesterday at luncheon his guest, Dr. Richard C. Nelson, a petroleum geologist from Eugene, gave us a word picture of his stay at The Hague during the German entry and occupation.

At the luncheon a week ago there were a number of interesting guests and, as always, interesting specimens.

Bruce Schminky brought a piece of flinty or opal-like material from the new tunnel being built on Cornell Road. In addition he produced some propoganda for the Lincoln Beach trip scheduled for October 13th in the form of fossils he had gathered while scouting the trip. He assured us that it is a good locality for marine fossil hunters and we are looking forward to that trip.

Leo Simon had a specimen of rhyolitic tuff flow which Mr. Weygandt had cut down and polished. He has been watching the drilling of the well at Sixth and Washington which the Wilcox Building is doing for their air conditioning system. I had wondered why they weren't going to use city water but it seems the well will produce much colder water.

Dr. Arthur Jones had a concretion which raised quite a controversy as no definite reason could be given for its existence. One title given was "a piece of petrified kindling wood".

John Allen had a tray of pyrite crystals a highway surveyor had brought him which he passed around. He generously said all present could have one, but he qualified this with the statement that he had already selected the best specimens. They were nice ones tho and I have one. While small, under a glass it is easy to study. These were found on the Wilson River Highway at the top of the summit and were found in a road cut in carbonaceous shale.

Dr. Booth had a number of specimens from Clay Center, Ohio - now you know we should have explored our home state before going afield. These included Celestite (white) ($SrSO_4$) with radiating crystals; Celestite (blue) strontium sulphate ($SrSO_4$) which is used commercially in the production of fireworks; Fluorite crystals (brown) with streaks of Celestite and this fluoresces brown to green; some Celestite group crystals (white) and very lovely ones too. He also had a piece of what is known as "petrified moss" from a calcareous deposit, hot springs, Fall River, South Dakota.

Dr. Arthur Jones and his wife had as guests Dr. Jones' aunt, Dr. Sargent, from Berkeley, who had spent fourteen years in China, and Dr. Lester Jones, his "big brother".

Mr. Holdredge presented his wife as "just Mrs. Holdredge". I'll bet he heard about that later.

Dr. Dake presented Dr. Colburn to the group. Dr. Colburn is curator of minerals at Cranbrook Institute of Science, Bloomfield Hills, Michigan. He gave a very interesting lecture the next evening to the G.S.O.C. on the mineral collection of the Institute. Dr. Booth had previously stated (maybe with malice aforethought) that when securing the specimens from Clay Center he had been told that the Cranbrook men always got the best specimens so Dr. Colburn capped this by saying that the mention of Clay Center made him feel at home.

Mr. Stevens had just returned from a business trip to Washington, D C., and while his description of his visit to the Carnegie Institution Laboratory was over my head in technicalities, his statement as to his difficulties in arriving there tickled me. It seems the taxi driver didn't know where the Laboratory was located so much wandering was done thru Rock Creek Park and environs. First time you have a chance you'd better look it up - I think you would be interested. It is out on Broad Branch Road, about Nebraska and Connecticut - so you won't have to wander too much.

Mrs. James was there for the first time in quite a while, and I'm afraid I'll always remember her for her characterization of the Silurian Age at the Fossil Convention, tail light and all.

Yesterday Dr. Booth had some more specimens from Franklin Furnace, New Jersey, and as I've such a lot more to say I won't describe each one this time. They were interesting as always and he told us that there are probably 150 different varieties found in that locality of which thirty or forty are found there and no place else.

Leo Simon had some specimens from the "Ole Peterson" field trip showing the lava formations.

Mr. Libby introduced Mr. Hite who is associated with the U. S. Soil Conservation Service.

Mr. Vance had as his guest Mr. Olaf Laurgaard who was at one time city engineer of Portland.

Miss Rachel Overing was a first time visitor to the luncheon.

Mr. Holdredge had two guests, as well as Mrs. Holdredge, a Mr. McCusker, a resident of Portland who is in the supply business here (what kind of supplies I have no idea - rather intriguing tho), and Dr. Nelson whom I mentioned before.

I could go on, but this is too long now.

Katie.

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THE GEOLOGICAL NEWS-LETTER

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

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I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

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Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR.

Thursday Oct.24 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN, 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Oct.25 — Subject; THE CHEMICAL STORY OF ALUMINUM.
Speaker: Dr. O. F. Stafford, University of Oregon.
This is our opportunity to learn something of the fascinating chemical and metallurgical history back of every part of aluminum, a mineral as essential to national defense as it is to the preparation of Sunday dinner. The Portland area is in line to become the center of production of this strategic mineral, and it behooves us all to learn something of its chemical nature.

Sunday Oct.27 — Details for the trip have not as yet been completed. Watch daily papers for further information.

Thursday Oct.21 — Luncheon at The Orange Lantern.

Thursday Nov. 7 — Luncheon at The Orange Lantern.

Friday Nov. 8 — Subject: GEOGRAPHICAL AND GEOLOGICAL SKETCHES OF PERU.
Speaker: Earl K. Nixon.
Mr. Nixon, director of the Oregon State Department of Geology and Mineral Industries, has recently returned from another trip to Peru, where, owing to the official nature of his work, he was enabled to see much that the most diligent tourist observer would miss. His talk will be illustrated with slides of photographs taken by Mr. Nixon in natural color, which will serve to show much of the geography and culture of the country; many of these are aerial views.

Thursday Nov.15 — Luncheon at The Orange Lantern

Saturday and Sunday Nov.16-17 — This is advance notice of our trip to Corvallis. Further details in our next bulletin. Reserve this week-end.

Thursday Nov.21 — Thanksgiving Day! No meeting

Friday Nov.22 — Subject: TECTONICS OF THE WALLOWA MOUNTAINS.
Speaker: John E. Allen
The tectonic history of this interesting and spectacularly scenic region will be brought to us by Mr. Allen, who has made a detailed study of the regional geology. His address will be illustrated with natural-color photographs showing the beautiful examples of geological phenomena in the Wallowa country.

WARM SPRING INDIAN RESERVATION TRIP.

Sunday, September 15th, was scheduled for a trip into the White River country, east of Mt. Hood, under the leadership of Eric Gordon, District Ranger, at Dufur, Oregon. But at 5:00 p.m. Saturday Mr. Gordon called to say that heavy rains on Friday had made the roads impassable and that the trip would have to be abandoned.

When the party met in front of the public market on Sunday morning it was decided to choose a substitute trip, to be decided on when we got to Government Camp. At Government Camp we found that several cars had gone on to await the party at Bear Paw Forest Camp. This camp seemed to be a stranger to most of the party and several carloads of geological enthusiasts shuttled back and forth between the two branches of Ollalie Lake road looking for the elusive camp which was never located. All of the party got together somewhere in the vicinity of where the camp ought to be, all except the Simons who with a little tracking caught up with us at Wapinitia where we left the highway and turned south towards the Indian reservation.

The first stop was made on Juniper Flats south of Wapinitia, to call to the attention of the group that they were now on the Madras surface. It was pointed out the ridge ahead was the northerly limb of the basalt anticline that once completely covered the Mutton Mountains to the south. A. W. Hancock informed us that this was the site of an Indian encampment in the days preceding the coming of the white man. He said many artifacts have been picked up here along the creeks and in the groves of timber which reach out into the flats. A little farther along we came to an area where there were quantities of thunder eggs and several started gathering enough for a setting. Mrs. James found a rattlesnake under a rock and to some of the party it was their first sight of one of the reptiles. Schminky says it is the first one he has ever seen in his many trips to this part of the country in the past twenty years.

H. B. Wood pointed out to the group that the rocks which appeared here did not seem to be true rhyolites, but that they probably were tuffs which were cemented by silica, due to hydrothermal action.

Driving on from here we arrived at the Indian town of Simnasho in time to eat our lunch at an abandoned CCC building. After lunch the party prospected the surrounding terrain and collected a number of specimens of thunder eggs, mostly broken, and included in the loot was a pair of hand carved piano legs of recent age. The rest of the piano was there too, thrown out on the dump by a departing CCC outfit. Several of the feminine members of the party with the help of Prof. Webber tried with doubtful success to wangle a few woozy tunes out of the relic.

A half mile or so beyond Simnasho we stopped to examine and get samples of pearlite. Thunder eggs too were becoming more numerous as we dropped down into the canyons. As we came over the new road that leads down into the Warm Springs River Valley a short stop was made to enjoy the panorama of hills and valleys that lay below us. Mr. Simon pointed out to the rest of the party the tortuous road over which the society traveled when they were led by Dr. Hodge a number of years ago in search for some elusive giant thunder eggs and which they were unable to locate.

A half mile or so above the Devils Gateway more thunder eggs were gathered until sagging car springs warned that enough of this kind of cargo had been taken aboard. By the time the party had reached the Warm Springs resort the day was pretty well spent and an approaching rain storm hastened the breaking up of the

party and a hurried drive back to the highway and Portland. But not before stomachs and lunch baskets were filled with peaches and plums donated by the lady operating the resort. The weather which had been ideal all day suddenly turned rainy and blustery. The rain came down in torrents but as we crossed the divide into western Oregon we left the rain behind and ran on to dry roads.

- H. L. Jennison

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OREGON MINING ARRIVES

by Earl K. Nixon

When one of the State's basic industries attains an actual, tangible value to the state of $10,000,000 measured in value of actual material produced in a twelve-month period, we feel that it can be said to have "arrived".

Arrived in the sense that it can no longer be referred to by the citizens of the State, or others, as a fledgling or anemic member of the State's economic family that rates an occasional apology for its backwardness. The growth of mining in Oregon in the last few years has been rapid but based on sound principles. As the production curve will show, and making due allowance for the lag in time necessary for exploration and installation of equipment, there has been an enhancement in value of gold output as a result of the increase in the price of gold in 1934. There has been, also, during the past year, a rapid increase in the production and value of quicksilver due to the increased price of the metal as a result of war conditions.

While these two factors are given due weight as providing the incentive for increased production, other factors of possibly equal importance are plainly evident and lead to the belief that the State's mineral industry is on a much firmer foundation than ever before in its history.

The writer, since returning from two or three months in South America where his mind was entirely detached from the mining situation in Oregon, has been taking stock of the mining and mineral industry situation in this State. We have recently visited the mining areas in eastern, central and southwestern Oregon with the principal object of determining the reasons for the increasing eminence of Oregon mining, the attitude of mine operators themselves toward the industry, the attitude of the public - especially investors - toward mining, and the evidence of growth materially and psychologically in the entire setup of mineral production in the State.

Certain points stand out as we view the matter - first, and most important, we are finding an ever increasing number of sound, experienced mine operators and mineral producers in this State. They are men, for the most part, who are experienced in the business of making money out of the ground because of their technical and business capacity. For example, in the case of a lode gold operation, if they put jigs after the classifier, they know why they are putting jigs after the classifier, and are not doing it purely because they think a jig is put in the circuit somewhere; if they grind their ore to minus 100 mesh instead of minus 50 mesh, they know why they are grinding to that fineness because of metallurgical test work carried out by them or by some custom metallurgical laboratory; if a placer producer digs his ground with a carry-all instead of with a shovel and trucks, it is because of careful calculations and perhaps past experience in

handling ground; if a quicksilver operator adds an extra furnace or extra condensing capacity, it is quite certainly because he has carefully figured in advance all factors involved. Perhaps he wishes to handle a larger tonnage of somewhat lower grade ore - a matter of conservation and economics - or it may be that he has discovered a way to plug a leak in his profit-bag. In any event, there is a sound basis for making the change.

We note the very definite trend on the part of operators toward making their mills, mining methods and production schedules fit the mine rather than the wishes of lay directors. How often in the past have we seen improper financing, misunderstanding of mining economics, and the determination on the part of an inexperienced directorate to control mining details from a distant board room. A not infrequent procedure has been to cause a mine superintendent to "pick the eyes" out of his property and find himself with the mill paid for perhaps, but with the chutes empty and no ore developed. Usually the project ends in failure as a result of neglect to recognize technical essentials.

Another reason that Oregon mining is growing is that Oregon capital in ever increasing amount is going into Oregon properties. That must be on a basis of faith - well justified faith.

Mining investors are beginning to realize more fully that developed ore in a mine is exactly analagous to a back log of orders for a manufacturing plant. They are beginning to realize, thank heaven, the soundness of doing adequate, and I mean ADEQUATE, and careful preliminary work of exploration and development. For that is really the most important money spent at a mine. On it depends the future prosperity of the operation.

Two years ago, we could count on the fingers of two hands the quartz, quicksilver and placer operations in this State that had definitely developed and pegged advance ore for a six-month or longer mining operation. We certainly could not do it now, and that really is the essence of the present soundness of mining in this State. For example, "A" is a certain cyanide operation we have that knows quite definitely where its mill ore is coming from for the next two or three years; "B" is a dredge operation that has its gravel explored for the next ten years of operation - there are more than one in this "B" group; "C" is a quicksilver operation that knows where its ore is coming from two or three years from now whether the price of quicksilver is $175 a flask or $75 a flask; "D" is a quartz property with flotation mill with proved ore for many, many months- and there are several of these; "E" is a big mechanical placer with two years or more gravel explored ahead; and "F" is a doodle-bug dredge digging merrily away, soundly operated and making money - there are also a number of these. We could mention non-metallic operations of the same satisfactory nature. Each is a credit to the State, to the operators and investors who brought about its existence.

Three years ago "promotion" was a term that seemed almost a byword in this office, whether used by ourselves or by visitors. Now, we don't hear the word once a week. There must be a reason - and it's a healthy sign.

Adding up the totals, Oregon mining and mineral production are now something to be reckoned with. No apologies need be offered. We are handicapped by lack of smelter facilities, by high cost transportation, by lack of a larger consuming population, etc., but we see light on the horizon. We see possibilities for a zinc smelter, for a chrome plant, for early increased production of limestone for agricultural fertilizer and for manufacture of carbide, increased demand for Oregon refractory material, etc. Incidentally, manufacture of carbide opens up a

wide vista of possible industries resulting from acetylene by-products.

It seems also pertinent to remark here, as we have stressed before, that probably the greatest possibilities for growth in the State's mineral industry is in the field of non-metallics. Growth will be steady as population increases and new industries are established. The field is largely virgin; the potential supplies are enormous. While usually less spectacular than production of metals, the fundamental usefulness of non-metallics cannot be overemphasized.

An index as to the trend of things is a large increase in the demands made on this Department for geological and engineering advice, for facts and figures on the availability of mineral products, on markets, and, in general, on the feasibility of divers projects involving use and production of Oregon minerals. It's a mighty healthy trend.

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Dear Jim:

Football weather in Oregon has been the best ever even tho we get our football via the radio. I start listening at eleven o'clock on Saturday morning and there is a game on someplace for the rest of the day. I suppose George Washington still gets your loyalty. Out here we take in the entire coast as well as the midwestern and eastern schools. Not being a native Oregonian I can be choosey. However, we have a nephew at Oregon State this fall so I guess Ohio State and Oregon State will have to join' hands.

Last week's luncheon day was moving day for us so I didn't attend. No, we didn't move far - just upstairs - but that was as much work as if we have moved clear across the continent again. We're on the top floor now - I suppose we'll be living in a tent on the roof next. I was sorry I did miss the luncheon, however, as a fine tribute was paid to Dr. Lazell and to William McKenzie's Dad, both of whom died recently.

This week's luncheon was as informal and interesting as usual and I'm sure you will want to hear about the "goings on".

Mr. Rockwell was present and as I had always associated him with the Agate & Mineral Society I was rather surprised. It seems tho that he also belongs to the Geological Society of the Oregon Country. He showed a beautiful group of turquoise and other pieces which he had collected. They were cut and polished and the showing was consequently more brilliant than if shown in the matrix. He had made a trip to a turquoise mine in Nevada this summer and had dug out his own specimens. The plate on which the specimens were shown had a number 15 printed thereon which, as he informed us, meant the specimens were counted. (H'm!)

John Allen always comes up with something of general interest and he didn't fail us. According to him there is now in the local library (I know you can find it in the Congressional Library as well) a bound copy of a new dictionary of geological terms published by C. M. Rice, Ann Arbor, Mich. He has checked it fairly thoroly and anything obscure we can't check on in our ordinary sources will probably be there. I know we will have use for it frequently.

Dr. Weinzirl has just returned from a medical meeting in the midwest and the morning paper had carried a story of the meeting in which reference was made to the possibility of mild influenza this winter. He was kidded about this as he is

teaching a public health class this year. He also showed a piece of quartz with a rich showing of gold. Everyone wanted stock in his mine but he said it was presented to him. This piece came from New Mexico.

Lloyd Ruff showed us a drill core of hydrothermally altered andesite with quartz and zeolite vein running thru. This came from the Detroit Damsite at a depth of 72' below the surface. That is Detroit in Oregon on the North Santiam, not Michigan.

Mr. Upson presented his wife to the group altho he said he felt he considered himself just a newcomer. He and Mrs. Upson had gathered some Indian artifacts at Fort Rock. These consisted of arrowheads and a mano - I believe he said - a rock which just fits the hand and is used in grinding corn.

Speaking of corn, Mr. Bates told us that while in Corvallis recently on some seed business he found that fluorescent light is used to detect differences in certain annul and perennial seeds and that he was surprised how they fluoresced. He also introduced his guest, Mr. Laurence.

Kenneth Phillips introduced Mr. Riddell who is with the Army Engineers. Remember when you worked for the Army Engineers out of Huntington, W.Va., and went out on the Ohio in their launches? You would like the Columbia and the Willamette.

Jumping back to fluorescent articles again, John Allen told of an advertisement for a prospector's fluorescent light. This is to be used in detecting minerals at night by their fluorescent glow but the advertisement also advised that after locating the rock to step on it first as it might be a toad, lizard, or even a rattler. I had no idea so many things fluoresced. We have been intending to get one of the lamps and if we do I shall try it on everything in the apartment from make-up on up, or down.

Miss Hughes showed a piece of quartz with a vivid pinkish red stain. This came from the Gulf of Georgia off Vancouver Island and no one seemed to know why the stain should be there. Our "board of experts" sorta fell down on that one. They generally have an answer.

Mr. Hancock was selected secretary of the Northwest Federation of Mineral Societies at their convention in Spokane last week. He said it is a nice honor, but I'm afraid a lot of work as there are twenty mineral clubs in the organization. He also won a blue ribbon for the best fossil collection exhibited and if you ever see his collection you'll know the reason.

We heard him give a talk last evening at the Agate and Mineral Society on hunting fossils in the John Day region. His talk was very well given and in terms we all could understand. He rattles off the geological period terms so convincingly such as Permian, Cretaceous, Oligocene, Miocene, etc. (I'm copying them from a book) that while listening I feel like they are ordinary everyday terms but I can't use them myself when the occasion arises. He did say that when looking for fossils in that region that the fossils were always in the green sediments, not the browns or reds. Well, we looked in the green but had no luck when we were there - I guess we'll have to try again next spring after the rains are over.

Maybe I'll know more by the end of this school year, however, as I'm taking Dr. Hodge's course in Geology and he explains everything so clearly both by word and by diagram that I should learn a few things. The book this year is Geomorphology, by Lobeck, and it is the best oneI've run across. Mostly photographs and diagrams; it is well explained.

Mr. Holdredge has been reading some reports put out by the Carnegie Institute on hot springs and fumaroles edited by Day and Allen. He said that while technical they were very descriptive and we should enjoy them. They are reserve books in the library here so when I have a free day I'm going to investigate - if I can beat someone else to them. Fumaroles are widely distributed over the country so I want to know what I'm looking at the first time we run across one.

Well, I have run on. How about sending a few lines one of these days? You aren't that busy.

Katie.

****

GIANT UINTATHERE SKELETON RECOVERED FROM BRIDGER BASIN.

A nearly complete skeleton of a giant uintathere has just been recovered from approximately 30,000,000-year-old deposits in the Bridger Basin in southern Wyoming by Dr. Charles L. Gazin, Smithsonian Institution paleontologist.

This fantastic creature was probably the dominant animal of the mid-Eocene period in North America - a time when the ancestral forms of present-day mammals were taking shape out of the confusion of primitive warm-blooded creatures. It was almost as large as an elephant. Parts of the skeleton, especially the feet, mightly easily be mistaken for those of some primitive member of the elephant family.

The uintathere, however, belonged to an entirely different line of evolution. It perhaps resembled the rhinoceros in outward appearance more than any other extant creature but cannot be considered in that line. After mid-Eocene time it disappeared from the earth, making way for the more efficient groups of animals represented by extant forms. Its bones are found only in the Bridger deposits, classic field for mid-Eocene fauna.

In appearance the uintathere must have been a fearsome creature. It had six horns on its skull. Protruding from its upper jaw were two sabers, from ten inches to a foot long, similar to those of the saber-tooth tiget. Its face was prolonged into a snout. But while it would have been a formidable antagonist, all this fighting equipment, it is likely, was primarily for defense. The uintathere was an herbivorous mammal, as are most creatures who attain giganticism. Presumably it was a stupid creature.

The causes of its extinction, Dr. Gazin explains, are unknown. The line, like that of the titanothere group, came to an end abruptly. It probably had become nicely specialized to the environment in which it lived and was unable to adjust to any major change in this environment, such as a change in climate. Something like this had happened millions of years before to the giant dinosaurs. There was, of course, no relationship. They were reptiles, whereas this was a specialized type of mammal.

Uintathere bones are fairly common in museums, but skeletons, for the most part, have been broken up badly in the millions of years of earth stresses since the owners died. The specimen obtained by Dr. Gazin is unique in that it lacks only one hind leg, part of a front leg, and the neck. The lower jaw was badly damaged. The skull, about a yard long, was in exceptionally good condition. Dr. Gazin also obtained a skull of another individual, including one fine saber. During two months' work in The Bridger area this summer he also got a considerable collection of the microfauna of the mid-Eocene period, the little creatures of the ancient forests, many of whom outlived the giant uintatheres.

Before going to the Bridger, he spent several weeks in an area in central Utah where the rocks contain fossils of lower Paleocene mammals - creatures of about 50,000,000 years ago. There was a great variety of them, most of which have no direct descendants on earth today. Many of the lines had run out, in fact, before the development of the uintatheres.

The dominant order, in variety and numbers, seems to have been that of the condylarths. These were small hoofed animals, ranging in size from that of a rabbit to that of a fox. They are classed by paleontologists as primitive ungulates, the general group of horses, deer, antelopes, etc., of the present being modern ungulates. The earliest ancestors of these presumably would be found in the condylarth group, but are not certainly recognized in any genera yet discovered. Most of these were extinct in the Eocene period when the most primitive horses made their appearance.

- Smithsonian Institution

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TRIP TO THE LEWIS RIVER REGION - SEPTEMBER 29.

After leaving Portland the first stop was at Battleground Lake where the party reassembled and proceeded in caravan. Battleground Lake was skirted for the benefit of those who had not seen a crater lake so near at hand. No stop was made here.

The cars were parked at Pandemonium Creek and after examining the Pahoehoe type lava flow at the bridge, the party walked half a mile to the head of Christmas Canyon to view at first hand the effect of the flood that made this canyon in such a short space of time.

The canyon is about half a mile long, with an average width of about a hundred yards and from a hundred to a hundred and fifty feet deep. This immense amount of material was moved and the canyon formed in a few hours time the night before Christmas in 1933. An extremely heavy rain had been falling for a day or two before this. It had amounted to five or six inches in the vicinity of Portland and up in this locality where extremely heavy rains are of usual occurrence in the wintertime there was probably a much heavier precipitation. About a mile above the canyon is a depression known as Grass Lake. In times before this water had collected in the basin and then later on had gradually seeped out through the floor of the lake. On this occasion the rainfall was so heavy that the amount of water running into the lake was so far in excess of the outflow that a tremendous pressure was built up. As the water rose higher and higher it was forced through the underground channels at an ever accellerating speed until finally the channel was forced open and the whole volume of water in the lake rushed through with a torrential rush, carrying with it an immense amount of bedded gravel, sand and volcanic ash. It undermined the hill capped with a recent lava flow and covered with large trees. Such an immense amount of material was carried away that the whole areaabove what is now the canyon collapsed into the flood waters and was carried down to, and dammed for a short time, the Lewis River, which itself was at flood stage at the time.

Since the society visited the place in August 1935 alder trees have started to grow in the head of the canyon and along the stream bed of the creek. Aside from this new forest cover and the quite noticeable erosion of the sidewalls near the head of the canyon it looks very much as it did at that time.

By the time we got back to the cars it was high time for lunch so we drove up to the campground a little beyond, where we found the Holdredge family had preceded us. Claire was prevailed upon to give us a little talk about the geology of the region and especially the formation of Christmas Canyon.

A short walk back of Ole Peterson's place brought us up on to the lava field which has many interesting and novel features. Tree cast holes with the bark markings quite evident are numerous and some of them are of great size and length quite comparable to the trees that grown in the region today. This flow is of very recent origin. Some members of the party hazarded the guess that it is less than two hundred years old. Very little vegetation is growing on the field and what trees there are are small and scrubby. This flow is supposed to have come from Mt. St. Helens which is only twelve or fourteen miles distant. A depression or "blowhole" in the lava was visited and various theories were advanced for its formation from the explosion and blowout theory to the collapse idea. It was finally and generally decided that it must have been the latter owing to the fact that no blocks of lava were scattered around the place as there would have been in case of an explosion.

Perhaps the highlight of the trip was the walk or rather scramble through the long stretch of the lava tunnel. In most parts of the tunnel it is easy to walk upright and in only a few places does one have to stoop to avoid hitting his head on the ceiling. The lava tunnel is about five-eighths of a mile in length, and winds and turns much as a surface stream bed might do. Along the side walls, flow lines mark the different levels of the molten lava as it flowed beneath its hardened crust. The walls and ceiling were glazed and the ceiling was studded with hanging drops of lava which had hardened before they could fall. There is evidence that the tunnel extends further towards Mt. St. Helens but piles of rocks fallen from the roof barred the way.

The return to our cars down a rather steep trail was soon accomplished, and by that time the shades of evening were falling, and the party disbanded, each to return to Portland any way he chose.

- H. L. Jennison

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THE GEOLOGICAL NEWS-LETTER

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor.

DATES TO MARK ON YOUR CALENDAR

Thursday Nov.7 — Remember our interesting Thursday noon luncheons at THE ORANGE LANTERN, 4th floor Central Building, 10th Ave. between Alder and Washington.

Friday Nov.8 — Subject: THE DUTCH EAST INDIES.
Speaker: Mr. J. R. Ward
(Note that Earl Nixon's talk on Peru has been set over to a later date). There are few if any foreign areas which mean more to United States economy and diplomacy than the Dutch East Indies. Mr. Ward spent several years in this region as a geologist for the Standard Oil Co. of California, and has returned to Portland very recently. In addition to discussing the geology of the islands, Mr. Ward will tell us something of the culture and habits of the natives, illustrated with specimens of native art and handicraft. Pictures will be shown.
Society members will remember Mr. Ward as a graduate of the University of Oregon who was formerly employed in geologic work for the U. S. Engineers under Dr. Hodge.

Thursday Nov.14 — Luncheon at The Orange Lantern.

Saturday and Sunday Nov.16-17 — Annual visit to the Department of Geology at Oregon State College, Corvallis, Oregon. The Department is now located in its new home in the Education Building. We will also be guests of Sigma Gamma Epsilon on this trip.
The program will include: 1- Open house in the classrooms and museum of the Department, Saturday afternoon.
2 - A banquet in Memorial Union Building, Saturday evening. Price 75¢ per plate.
3 - A talk by Dr. Allison on "Pleistocene Lakes of Oregon" Saturday night.
4 - A field trip in the vicinity of Corvallis, Sunday.
If you have not registered for this trip, call H.B.Schminky, LA 3903, at once.

Thursday Nov.21 — Thanksgiving Day! No meeting.

Friday Nov.22 — Subject: TECTONICS OF THE WALLOWA MOUNTAINS.
Speaker: John E. Allen
The tectonic history of this interesting and spectacularly scenic region will be brought to us by Mr. Allen, who has made a detailed study of the regional geology. His address will be illustrated with natural-color photographs showing the beautiful examples of geological phenomena in the Wallowa country.

Thursday Nov.28 — Luncheon at The Orange Lantern.

Thursday Dec.5 — Luncheon at The Orange Lantern.

Friday Dec.6 — Subject: GEOGRAPHICAL AND GEOLOGICAL SKETCHES OF PERU.
Speaker: Earl K. Nixon.
Mr. Nixon, director of the Oregon State Department of Geology and Mineral Industries, has recently returned from another trip to Peru, where, owing to the official nature of his work, he was enabled to see much that the most diligent tourist observer would miss. His talk will be illustrated with slides of photographs taken by Mr. Nixon in natural color, which will serve to show much of the geography and culture of the country; many of these are aerial views.

Thursday Dec.13 — Luncheon at The Orange Lantern.

Sunday Dec.15 — A local trip. Details will be given in the next News Letter. Leader Mr. AMZA BARR.

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We neglected to say in the last News-Letter that the article "Oregon Mining Arrives" was taken from the Ore.-Bin.

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NIXON LEAVES HOSPITAL NOVEMBER FIRST.

Earl K. Nixon, director of the State Department of Geology and Mineral Industries, returned home Friday from the Good Samaritan Hospital after a sojourn there of ten days, during which time he was relieved of his appendix (which is on display for those who are sufficiently interested).

We will be mighty pleased to see Earl at the meetings again, fully recovered from the ills acquired in the southern hemisphere.

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SALEM MEMBERS PROPOSE TO FORM A CHAPTER

G.S.O.C. receives their Petition.

From the earliest days of this Society there have been a few residents of Salem who were members of the G.S.O.C. Their number has been increased during the past year or two by the addition of some Portland members who have moved to Salem. Thus there developed an appreciable nucbus of the Society in Oregon's capital. That city having a university, various state departments and other organizations in which there are many individuals whose minds run in the same channel as those of our Society members, it seemed reasonable to expect that there would be ample material to form a chapter of the G.S.O.C. with a prospect of an active and useful future.

This was the underlying thought which prompted a meeting on October 1st at the home of Mr. and Mrs. Franklin L. Davis. Practically all the local members were present and they all concurred in the desirability of forming a local chapter. A petition to the executive committee of the Society to that effect was drawn up and signed by all present.

On October 16th Mr. and Mrs. Davis were again hosts to the group at a second meeting. Among those present were Dr. and Mrs. E. L. Packard, who came from Corvallis specially for the occasion. At this meeting a committee to develop the details of the organization, pending the official sanction of the parent Society, was formed as follows: Professor Herman Clark, chairman; Glenn S. Paxson, vice-chairman; Mrs. W. A. Reeves, secretary; Mrs. H. Mildred Stockwell, treasurer; Mrs. Carl P. Richards, historian; Vivian Carr, Franklin L. Davis, Winston Purvine, Wm. A. Reeves, and Carl P. Richards, directors.

It was further planned that the chapter should hold lecture meetings once a month; have one field trip a month and, following the successful practice of the Society in Portland, hold a weekly luncheon meeting in a downtown restaurant. The appointment of committees to arrange the lectures and trips was left for another occasion, but it was decided right then to have the first luncheon the following Tuesday, October 22, at the Golden Pheasant Cafe.

In this manner a working plan for the chapter was tentatively formed. The luncheon was duly held as arranged and proved a successful affair, twelve persons being present. In the absence of Prof. Clark, Mr. Paxson presided. Towards the end of the luncheon Mr. Stevens, President of the parent society, came in and the opportunity was taken to officially present him with the petition for the formation of the Salem chapter. Responding, Mr. Stevens stated that, since this was the first chapter proposed, caution must be exercised, as there were no precedents to guide the procedure. He added that it was with great pleasure that he received the petition and he would be glad to bring it before an early meeting of the board of directors.

Thus arises Salem's first geological group with hopes and aspirations for great accomplishments.

- Florence M. Richards

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HYPOTHESIS FOR THE PERIGLACIAL "FISSURE POLYGON" ORIGIN OF THE TENINO MOUNDS, THURSTON COUNTY, WASHINGTON.

Abstract

The latest and most constructive work on the "mounded Prairies" was published by Bretz in 1913. He divided the mounds into a symmetrical uniform silt "Mima Type" and an irregular gravel "Ford Type". Those on Mima, Grand Mound, and Rocky Prairies are "Mima Type" and their proximity to Tenino has given the common name "Tenino Mounds". Bretz reviewed all previous hypotheses including man, plant, animal, fish, glacial, water, and wind origins, and concluded the origin was inexplicable with the knowledge of that time. In 1932, Eakin recalled what must have been the mounds, and pronounced them periglacial stone stripe effects.

The haycock-like mounds are composed of black pebbly friable silt and lie on the upper surface of open textured outwash Vashon (late Wisconsin) gravels. The cobbly gravel is exposed between mounds in a reticulate plan that includes many shallow enclosed saucer-shaped swales. The mounds are divided by the writer into mature and immature. The mature are shaped like sphere segments while the immature are similar but are low and ill-formed. The mounds are from 1 to 7 feet high and from 20 to 50 feet in diameter. Where the prairie is not mounded the universal silt mantle is 1 to 3 feet deep.

Only two exceptions are taken to Bretz's field conclusions: (1) He said no orderly plan arrangement has been found in the mounds. The writer contends that the intermound spaces are a polygonal, mainly hexagonal, network. (2) He said the mounds antedate the kettles, but his text conflicts (p.102 and 89),on this point. The writer found the kettle slopes to be mostly mounded - thus the mounds postdate the kettles.

Since 1914 considerable has been learned about ground ice and geomorphic agencies in cold climates. Holmsen, Leffingwell, Huxley, and Nichols have all described a type of frost polygon named by Huxley "fissure polygon of the tundra type" . In areas having a mean subfreezing temperature an extremely cold period in winter may cause the ground to shrink and thereupon to crack in a polygonal system resembling a set of mud cracks but much larger with individual cells averaging 40 to 66 feet across. The first thaw water refreezes in and blocks these cracks. Further warming causes ice expansion and the bulging of the centers of the polygons. Once established these cracks normally continue and the ice widens year by year until they are great ice wedges that may occupy 20 percent or more of the ground surface area. When the ice melts out the poligonal inter-ice blocks slump down into mounds.

Sometime after Vashon outwash ceased, the black silt formation mantled the gravels. The moisture holding capacity of the silt made it liable to freezing in contrast to the gravel substrata. The ice wedges probably widened out over the gravel and bunched the silt into its present positions. The immature mounds furnish the most important illustrations of this phenomenon. They represent interrupted phases of the ice wedge development. Two principal objections with the hypothesis are considered to be: The post-Vashon cold climate necessary and the width of the gravel intermound strips. Neither of these objections are believed serious.

- H. C. Newcomb

****

November 1st, 1940.

Dear Jim:

Take a deep breath and settle yourself 'cause a lot of interesting things have happened at the last two G.S.O C. luncheons and I'm primed to tell all .

Ray Treasher was present as he was in Portland on business and to express true southern Oregon hospitality brought a sack of specimens which he donated to whomsoever desired any. These consisted of conglomerates from Myrtle Creek, some of which were coated with iron sulphide. He also had serpentine from near the California line.

Mr. Stanley showed some cores from the Grand Coulee which had been sent to him by Mr. Parsons, the guide of the party on the trip there this past summer.

Mr.Kimbrell showed some specimens from the Craters of the Moon. He admitted he wasn't there when they were formed and consequently did not know the reason for their formation. He also had two specimens he had picked up in Erie County, Pennsylvania, in the form of buttons. These had a conical structure and regardless of how they were chipped off still retained this basic formation. He also had a piece of the Arizona meteorite.

Mr. Vance showed a specimen of cinnabar and one of chalcedony cast on calcite crystals.

Mr. Schminky brought to our attention the trip planned for Corvallis November 16 and 17 and hopes everyone will register in plenty of time so that we'll all get fed at the Saturday night dinner. We plan to go so I lost no time in signing as I'm always ready to eat.

Speaking of the Schminky family, Mr. Vance informed the group that Carol Ann was to give a lecture to the sixth grade of the Glencoe school on Tertiary fossils. As the saying goes - "A little child shall lead them".

Lloyd Ruff introduced a new member of the "Cherubs", by proxy of course, in the birth of Judith Ann Ruff, seven pounds three ounces, on October 22. Skipping to the luncheon this week, John Allen capped him by announcing his new member, Cynthia "Sally" Allen, born October 30, seven pounds four and a half ounces.

The main part of the luncheon program was given over to Dr. Booth's guests, Mr. and Mrs. Peart. Mrs. Peart is known on the stage as Dale Hall, and her act grew out of her husband's desire to make his avocation of fluorescent minerals into a vocation. Mr. Peart had charge of the fluorescent exhibit at the San Francisco Fair and also furnished Sally Rand with her fluorescent show and fans. He has developed his own lights and does his collecting by night with a portable generator capable of producing 350 watts and uses approximately a thousand feet of line with his light thus enabling him to do a lot of climbing around. He said that if collectors told him of definite spots to collect that usually there was nothing in the exact location given but most always something in the locality. He has banded onyx from the old Manhattan mine in California which fluoresces and also has dolomite which has a great variety of colors. He said that he had lots of calcite crystals from Joplin, Missouri, from his father's farm and he would be glad to send some on request for the price of the shipment alone. Nice offer, don't you think?

Mr. Peart had his portable generator and light with him and Miss Hall had the skirt of one of her costumes so that we were able to see just how fluorescent light is used in the theatre. The skirt was a very full one and the design had been treated with fluorescent paint and then sewed on by hand. A tremendous lot of work must have gone into it as the pieces were small and there were a great many of them. Under ordinary light it was quite lovely, but under the fluorescent light it was gorgeous. The skirt took on a regal velvet appearance and the design was a mass of vivid colors. Of course everyone had to experiment and we found that nail polish, eyeballs,hair and even teeth fluoresce weirdly.

Going back to the everyday scientific Dr. Adams had as his guest Don Heyn of the U.S.Engineers Office who operates a seismograph in subsurface exploration at damsites in the northwest. I always had the idea that seismographs were only used to record earthquakes and were always set up in fixed places under definite conditions, but Mr. Heyn's is a portable affair and he said there were several other uses for the general principles of the seismograph.

As to this week's luncheon in spite of the pouring "soft Oregon" rain there were twenty-six present.

Mrs. Poppleton and her daughter were present after being away most of the summer on, as she said, a trip in the front seat of a bus all around the country.

John Allen, in addition to his "Cherub" announcement, had some sandstone concretions contributed by K. E. Hamblen which he had found on the desert in Mexico. They had quite odd shapes and were therefore baptized with new names.

Mr. Stanley showed us some pictures he had taken in the John Day region between Dayville and Arlington and as we had been there on our trip this summer they were especially interesting.

Lloyd Ruff introduced a new Junior Geologist who has been transferred recently to this area from the U.S.Engineers in Tulsa. Another nice looking blonde-Mr. Fred W. Tisdel. He also showed a drill core of andesite which, while it didn't look like andesite he maintained that exhaustive sampling and analysis indicated nothing else. This core is from the Dorena damsite and was drilled with a six-inch diamond bit. It shows platy structure and rehealed fractures.

Dr. Booth intfoduced his son-in-law, David B. Wharton, of Beverly Hills.

Mr. Libbey had as guest Mr. Jim Ward, a graduate of the University of Oregon who used to be associated with Dr. Hodge, and who is now a petroleum geologist. Mr. Ward has just recently returned from the Dutch East Indies and showed us a Javanese kris which is a small sword handmade by the natives. A really wicked looking weapon. Ken Phillips annexed him at once and I'm looking forward to hearing him talk on November 8.

Mr. Nixon is in the hospital and we all express our hopes that he will recover quickly.

Mr. Vance told us that KOAC on Thursdays from nine to nine-thirty has talks on geology and I'm going to try to listen every week.

This has been a long letter so guess I'll stop.

Katie.

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EARLY MAN IN OREGON

U of O Monographs - Studies in Anthropology No.3 - 1940 - in three parts.
1. Early Man and Culture in the Northern Great Basin Region in South-central Oregon. Preliminary Report - by L.S.Cressman.

This paper is a preliminary report on the work carried on by the University of Oregon in the Northern Great Basin region of Oregon before the 1938 field season. Reconnaissance was begun in Guano Valley in 1934. Later more intensive exploration was carried on in Catlow Valley where Catlow Cove No.1 and Roaring Springs Cove were excavated.

Catlow Valley is an undrained basin of approximately 4,300 feet elevation lying just west of Steens Mountain about 100 miles south of Burns in Harney County.

Along the east side of the valley there is visible a series of wave-cut terraces. The highest of these is slightly over 200 feet above the present floor. It is Dr. Antev's opinion that the water of the top terrace of the lake which filled Cotton Valley and the top terrace of Lake Lahontan were contemporaneous. Along this eastern shore line are wave-cut caves in the basalt and andesite.

Beach gravel was found beneath 6 feet of occupational material and roof debris in Catlow Cove No. 1.

In 1935 a human tooth and some fragments of ribs and vertebrae were found in a small dry pocket about 6 inches across, between two large boulders and heavy overlying rock. The impression is inescapable that there had occurred here an accidental death caused by a large rock falling upon one of the cave's occupants.

In 1937 a discovery was made that may possibly have marked importance in the history of early man in North America. Human skeleton material was discovered over a small area in the gravels at the north end of the cave.

Dr. Ales Hrdlicka examined the material and was of the opinion that "The skull and bones fall well within the range of variation of the oblong headed West Coast Indian".

Dr. E. A. Hooton later examined the skull and reported as follows: "In general type the skull corresponds closely to that of the early American Stratum of long heads such as represented in the Basket-maker of the Southwest and in many skulls from other areas."

Possibilities concerning the skeletal material may be stated as follows:

(1) That it was a burial which had later been disturbed by animals although no tooth marks were noted.

(2) That it was a secondary burial, a secondary burial however results in confusion of bones but not in scattering them.

(3) That it was a natural deposition of a body - either the individual crawled in the cave and died or the body was washed in by the waves during a storm when the water level was already in the process of being lowered by the changing postglacial conditions. The position of the body was coincident with the latter hypothesis.

That man occupied the cave soon after the recession of the water is clearly indicated by the condition of the south end, where occupation goes practically to the water-smoothed rocks of the floor.

In 1938 an excavation intended to determine the limits of the gravel, two fragments of bones were found near the top of the gravel about 5 feet from the skeletal deposits worked in 1937. Dr. Chester Stock identified one of the bones as Equus. We thus have Pleistocene horse in the gravel bed at the same level as the human remains. In 1939 a test pit in a cave in the Summer Lake region showed the presence of bones of Pleistocene horse and camel, bison, mountain sheep, bear, wolf, red fox and other mammals associated with human occupation.

Our hypothesis of natural deposition fits better into the whole pattern of evidence than any other single hypothesis, so for the present we offer late Pleistocene or early recent as the period represented by the skeletal remains of Catlow Cove no.1.

Further light on this ancient culture is summarized as follows:

(1) Early man was evidently in the Northern Great Basin at the end of the Pleistocene or Early Recent period. This man, as represented by the skull, belongs to the ancient Basket-maker type.

(2) The early culture of the Northern Great Basin was adapted to a lacustrine or marshy environment.

(3) The changes in food habits which occurred may have been due to change in environment with a new fauna or to other causes.

(4) Technology of the region was based upon the utilization of sagebrush bark, tule, wood and bone, but not leather.

(5) The projectile points are mostly made from obsidian. Puebloan types are found but have as yet little diagnostic value.

(6) The culture, as illustrated by the basketry of the region, would appear to be the center of diffusion archaeologically for the Northern Great Basin region extending to Lovelock, Nevada, on the south, to the Deschutes and John Day rivers on the north, and westward to the western limits of the Klamath basin, where similar basketry occurs in historic times.

(7) We may have here the origin of the Klamath-Modoc material culture.

(8) We shall eventually, by systematic extension of this work, discover whether there was a province of culture west of the Rockies extending from the Southwest to the plateau region of the north, and if there was such a province, what the cultural substratum was from which the latter localized types of culture developed.

- L.L.R.

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November Bulletin of The New York Academy of Sciences and Affiliated Societies has the following announcement:

November 4 Monday 8:00 p.m.

BUSINESS MEETING
SECTION OF GEOLOGY AND
MINERALOGY

Dr. Max Demorest

THE ROCK CALLED ICE
(illustrated by lantern slides)

Our members will remember the interesting and instructive lecture on Crystal Structure of Snow and Ice which Mr. Demorest delivered before our society last summer.

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 22 PORTLAND, OREGON Nov.25, 1940

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THE GEOLOGICAL NEWS-LETTER

Official Publication of the

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Editor-in-Chief and Business Manager

Raymond L. Baldwin
344 U. S. Court House
Portland, Oregon

Associate Editors

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MEMBERSHIP APPLICATION

GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Qualifications and Dues

A member shall be at least 21 years of age, who is interested in and supports the aims and objects of the Society and who shall be recommended by the membership committee. A junior member shall be over 18 and under 21 years of age.

The annual dues are: for members $3.50 (includes husband and wife), juniors $1.00

Date _____

I _____ (print)
do hereby apply for membership in the Geological Society of the Oregon Country, subject to the provisions of the By-Laws.

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Address

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Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

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I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor

DATES TO MARK ON YOUR CALENDAR

Thursday Nov.21 — Thanksgiving Day! No meeting.

Friday Nov.22 — Subject: TECTONICS OF THE WALLOWA MOUNTAINS.
Speaker: John E. Allen
The tectonic history of this interesting and spectacularly scenic region will be brought to us by Mr. Allen, who has made a detailed study of the regional geology. His address will be illustrated with natural-color photographs showing the beautiful examples of geological phenomena in the Wallowa country.

Thursday Nov.28 — Luncheon at The Orange Lantern.

Thursday Dec.5 — Luncheon at The Orange Lantern.

Friday Dec.6 — Subject: GEOGRAPHICAL AND GEOLOGICAL SKETCHES OF PERU.
Speaker: Earl K. Nixon
Mr. Nixon, director of the State Department of Geology and Mineral Industries, has recently returned from another trip to Peru, where, owing to the official nature of his work, he was enabled to see much that the most diligent tourist observer would miss. His talk will be illustrated with slides of photographs taken by Mr. Nixon in natural color, which will serve to show much of the geography and culture of the country; many of these are aerial views.

Thursday Dec.12 — Luncheon at The Orange Lantern.

Sunday Dec.15 — A local trip. Details will be given in the next News Letter. Leader Mr. AMZA BARR.

Thursday Dec.19 — Luncheon at The Orange Lantern.

Thursday Dec.26 — Luncheon at The Orange Lantern

Friday Dec.27 — Watch daily papers for announcement of speaker for this evening.

Thursday Jan.2 — Luncheon at The Orange Lantern.

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The following letter by Mr. K. E. Hamblen appeared in The People's Own Corner on the editorial page of The Oregonian, October 5th, 1940:

TIN

To the Editor: The United States bureau of mines and the United States Geological Survey have intelligently searched for many years to find a tin deposit which would supply some of the country's needs. None has been found. The geological habits of the tin minerals are well known to all economic geologists and mining engineers. Both cassiterite, the oxide of tin and stannite, the sulfide, which are the two commercial minerals from which the tin metal is produced, are found in crystalline rocks, usually granite or a derivative of granite, and are formed under conditions of high temperature and pressure. These conditions are found at depths of thousands of feet below the surface at the time of deposition.

The recent announcement that tin ore has been found over an area of hundreds of acres in the district between Burns and Bend approaches the incredible. The rocks in this area are from glassy lava, effusive rather than intrusive, which flowed out from surface vents from shallow depths and which cooled very quickly. These rocks are the least likely of all to contain tin minerals. They are the exact opposite geologically from the rocks in which tin is found elsewhere in the world. If it is established that tin does occur in this area, I'll go back to the foot of the class. There is no need for special or mysterious assay methods which the established laboratories "cannot do". If it cannot be found in a sample by standard accepted assay or analytical methods it just isn't there.

K. E. Hamblen
Consulting Mining Engineer.

*

Mr. K. E. Hamblen,
336 Lumbermans Exchange Building,
Portland, Oregon.

Dear Mr. Hamblen:

I am writing to congratulate you on your letter to The Oregonian on the 5th puncturing this tin bubble in eastern Oregon. We discussed this matter at the luncheon meeting today of this Society and decided that you were entitled to a vote of thanks. Please accept this as an expression of our appreciation for your letter.

Very truly yours,
J. C. Stevens.

*

Mr. J. C. Stevens, President,
Geological Society of the Oregon Country,
1203 Spalding Building,
Portland, Oregon.

Dear Mr. Stevens:

Your letter of November 7th pleases me very much. Such ventures as the one discussed are far reaching in effect and most difficult to overcome. The State of Oregon has suffered unjustly for a great many years as a result of the tin and platinum fiascos in southern Oregon. I am sure we will look forward to a complete expose' of this latest outburst as soon as the Department of Geology has finished its fact finding survey. . .

Sincerely,
Kenneth E. Hamblen

*

Dear Jim:

You know what a jig-saw puzzle addict I am and, having a new one, I could hardly tear myself away to scribble these lines. Hope you will appreciate my will power.

Believe it or not Ripley has recently been running in his cartoon the feature of self-made jobs and we had a beautiful example at the G.S.O.C. luncheon a week ago. John Allen has as his guest Maurice Brady who is now an office assistant at the Department of Geology and Mineral Industries. He made himself so indispensable at their office in Baker they had to give him a job in self defense. He is a nice lad and at the rate he is going should become successful.

As Mr. Stevens said, election is over and while everyone's candidate wasn't elected, we should all cooperate now and show a united front to the world. Of course that is being preached in all publications, addresses, and radio programs but we should take it to heart.

On the last field trip the Society took a jaunt in the west side hills and visited a rock quarry near North Plains. They found some vesicular basalt and Mr. Schminky brought a sample. Quite a discussion was raised and Ken Phillips suggested it might be 'tubercular'. It occurs in colors of black and blue and crystals are found in some of the cavities.

Dr. Jones had several specimens to show, one of which was a concretion found south of Neahkahnie. This Dr. Booth doubted as he had explored that region and hand't run across anything similar. He showed a group of quartz crystals in matrix from the Fern Ridge damsite in Lane County and a beautiful piece of peacock copper ore from Grass Valley, California.

Miss Jennings had as her guest Miss Anita M. Henkle, who is from her home town of Norman, Oklahoma, and Mr. Vance said immediately that we had a couple of "Okies" present. Miss Henkle has just returned from two years in India and told us an amusing story. It seems she was interested in knowing the people and upon request wrote to a young lad in northern India who was interested in America. Upon starting the correspondence she told the boy that perhaps some of the spelling would be strange as she was an American. The immediate reply thanked her and then said that the misspelling shouldn't interfere as both she and the native Indian were foreigners to the English language.

John Allen also introduced Wessley Paulsen, a junior geologist graduate of University of Washington.

Mr. Hancock had a concretion from the Buxton area which was debatable as it was unknown whether it was a fish or a sword. Mr. Simon said, however, that they weren't civilized enough back in those days to use swords but it looked to me like some prehistoric glamour girl's nail file.

Mr. Stevens read a letter written by Mr. K. E. Hamblen exploding the tin mine myth and this article is to be published in the News-Letter. I'll send you a copy. If anyone approaches you to buy stock in a tin mine in Oregon - you'd better think it over carefully.

The branch of the Society which is being formed in Salem has some mighty extensive plans set up and we are going to have to look after our laurels to keep ahead of them.

This week's luncheon had Mr. Nixon present but we couldn't get him to tell about "his operation".

Dr. Adams brought a specimen introducing it as Mrs. Adams. It is nice to see the ladies come as the luncheon is pretty well dominated by the male specie, but I think with Christmas shopping going on more of the ladies will be downtown and on Thursdays they will come to the luncheon.

Mr. Libbey has just been visiting the old iron mine and furnace at Oswego and brought a piece of the slag back to show. He said that when exploring this locality to be very careful as it is old and shaky and you are liable to have it fall on you. However, I believe he is writing an article for the News-Letter on this trip and we'll hear more about it.

John Allen presented Ralph Halle who is in this vicinity looking for mineral holdings. He is connected with the Freeport Sulphur Company of Louisiana. This company produces sulphur on the Gulf Coast and they are searching for the various alloy minerals.

Dr. Jones had a perfectly gorgeous specimen. A facet cut zircon one of the doctors lent him to show. I've never seen a zircon so lovely. My fingers itched and I know the others looked at it enviously as well.

In closing Mr. Vance advised that a table is reserved in the Barnyard at Lipman Wolfe's for Men Only every day except Thursdays and said that any man who disliked eating alone should join them.

Have to get ready for the Corvallis trip - so I'm still

Katie.

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NEW MEMBERS.

Ava A. Bickner	741 Medical Arts Building	BE 1701
F. H. Neuenschwander	Route 4, Box 1372.	

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The third edition (1940) of "THE MINERAL RESOURCES OF THE UNION OF SOUTH AFRICA" is more than just a catalogue of the mines of that interesting and far-away region. This 544 page paper-bound book, published by the Department of Mines, Pretoria (price 5s.) is a most interestingly presented and exhaustive study of the topography, mineral economics, and economic minerals of the Union.

The Union of South Africa has nearly five times the area of Oregon, and is over twice the size of the original "Oregon Country". It lies in the Southern Hemisphere at just about the same latitude as Mexico, and the climate varies from a desert on parts of the coast to over 70 inches of rain in the mountainous region. The most favorable living conditions exist on the high plateaus, where rainfall varies from 20 to 35 inches, and the undulating grass country supports a large cattle industry.

The Union of South Africa is divided into an interior plateau and a diversified tract of country between it and the ocean on the east, south and west. An escarpment separates the two regions, and the highest parts of the country (up to 11,000 feet) are generally on or near the edge of the escarpment. Forty percent of the Union lies above 4,000 feet, mostly on the interior plateau, which is generally a country of great plains from which arise flat-topped hills of irregular plan, for it is chiefly made of nearly horizontally bedded shales and sandstones and sheets of dolerite (Karroo series:Permian and Triassic) which vary in the resistance they offer to erosion. Where these flat rocks have been removed, the older rocks appear in ridges or plains according to the attitude of their beds or in irregular plains and craggy hills where there are extensive igneous intrusions. The interior plateau is divided into ten regions more or less sharply defined from each other by the shape and character of the surface and the climate. Among these divisions the High Veld, the Upper Karroo, the Kalahari and Bushmanland, the Bushveld and the Limpopo Highlands are names that appeal to the eye and imagination.

The Orange and Limpopo Rivers drain most of the plateau. Several rivers drain the escarpment area, and others drain the folded belt, following the strike of the rocks.

A much abbreviated summary of the geologic column is given here as follows (the original takes up five pages, and is discussed for more than twenty pages):

Age	Thickness	Name	Description
Recent	300'		Raised beaches, etc.
Tertiary	Small		Marine inshore beds, lignites.
Cretaceous	Thick	Seven divisions	Limestones, sandstones, clays, conglomerates.
Permian &	32,000'	Karoo system, as follows:	
Triassic	7,400'	Stormberg series.	Basaltic, andesitic, and rhyolitic lavas; red beds, sandstones, shales and coal.
	11,000'	Beaufort series	Shales and sandstones.
	9,000'	Ecca series	Shales and sandstones, coal.
	3,200'	Dwyka series	Upper shales, tillite, lower shales.
Devonian	10,000'	Cape system	Quartzites, shales, sandstones.
Algonkian?	19,000'	Waterburg system	Sandstones, shales, conglomerates, lavas and tuffs.
	Intrusion of Bushveld complex of basic igneous rocks and granites.		
	19,000'	Transvaal system	Mostly quartzites, shales, lavas, conglomerates.

Age	Thickness	Name	Description
	5,000'	Ventersdorp system	Same as above.
	33,000'	Witwatersrand system	Same as above, with also ferruginous beds, tillite, grits, etc. Gold deposits.
	36,000'	Pongola system	Much the same as above.
Archaean?	Over 25,000'	Swaziland system	Nearly all types above.

Small scale topographic and geologic maps accompany this portion of the report.

The total production of the Union to 1938 is estimated at over two billion pounds (nearly ten billion dollars) of which gold accounts for 77%, diamonds 10%, coal 5%. Transvaal produced 84% of the total. Production is recorded for forty-two different mineral products, the first 21 of these, in order of value of production, being as follows:

Gold	Platinum	Corundum
Diamonds	Manganese	Gypsum
Coal	Chrome	Pyrites
Copper	Osmiridium	Fluorspar
Tin	Iron Ore	Mineral Paints
Asbestos	Lead	& barytes
Silver	Soda	Magnesite
		Beryl (emerald)

Each of these forty-two minerals is discussed in more or less detail as to history (this is a good source book for the romantic history of the early diamond and gold discoveries), geology of the deposits, distribution, size and shape, origin, methods of mining, treatment and recovery, costs, labor, other economic factors, government control, production and statistics. There are numerous photographs (although the reproduction is rather poor according to our standards) and abundant diagrams and statistical charts. Maps showing the location of deposits are furnished under "Precious Minerals" (showing gold, diamonds and platinum), "Base Metallic Minerals" (showing 18 different kinds), and "Non-Metallic Minerals" (showing 18 different kinds).

Extensive bibliographic references accompany most of the divisions of the report, and a thirty-page alphabetical index increases its value as a reference book. All in all it is a publication of which any survey should be proud, and is a credit to the various governmental technical branches whose cooperation made it possible.

J.E.A.

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OSWEGO IRON.

The first iron blast furnace on the Pacific Coast was at Oswego on the Willamette River about 9 miles south of Portland. The erection of furnace and necessary buildings was completed, and the first pig iron cast in August 1867. This infant industry was of major importance to the community at that time, and one can visualize the great interest of Portland inhabitants - all 7000 of them - in the blowing-in of the furnace and in the tapping of the molten slag and incandescent metal. Particularly at night is such an operation spectacular and probably attracted many visitors to the Oswego plant.

In Mineral Resources of the United States dated 1868 (the second such report made by the Federal Government) J. Ross Browne, Mineral Commissioner, includes a rather extended description of the Oswego project, taken mainly from The Oregonian. Extracts of the report are quoted below mainly because of the historic interest. From a technical viewpoint, the difference in magnitude between the small furnaces of those early days and the giants of the present time is striking. The contrast is especially strong when we read of the fuel, flux, and ore being measured in bushels and hundreds of pounds while today such measurements are in hundreds of tons:

"ORGANIZATION OF THE COMPANY.- The 'Oregon Iron Company' was incorporated by signing and filing articles in the offices of the county clerk of this county, and of the secretary of State, on the 24th day of February, 1865. The incorporators were H. D. Green, W. S. Ladd, and John Green. The capital stock was fixed at $500,000. The stock was soon taken, the number of stockholders being 20, including many of our most sagacious and energetic business men. On the 13th of May following, the stockholders held their first meeting, and organized under the provisions of the statute by electing a board of directors, consisting of W. S. Ladd, H. C. Leonard, John Green, T. A. Davis, P. C. Schuyler, H. D. Green, and Henry Failing. At a subsequent meeting of the directors, W. S. Ladd was chosen president; H. C. Leonard, vice-president, and H. D. Green, secretary. Mr. P. C. Schuyler is at present acting secretary.

"COST OF THE WORKS.- Thus far the sum of all the assessments levied on the stock is only 27 percent, all of which has been paid in with the exception of $11,000 delinquent by three of the stockholders. The expenditures for building, opening the mines, constructing machinery, and stocking with material, was, up to the 1st of August, between $124,000 and $125,000. Since that date there have been, of course, some further expenditures, which can, at present, only be estimated; but the total amount is probably within $126,000.

"MAGNITUDE OF THE WORKS.- The company having prospected the mine, which is about two and half miles from the present village of Oswego, and having had the ore thoroughly tested, began excavating for the walls of the furnace and tower, on the 21st of May, 1865. Since then the work of building and opening the mine has been carried on without more than temporary suspensions till the present day. The works are run by water, taken from Oswego Lake. The dam across the creek, just below the foot of the lake, is 148 feet in length, and 22 feet in height, and is a structure of great strength. The flume by which water is conveyed to the works is 900 feet long and 3 feet square. The machinery in the blast-house is driven by one of Leffel's double-turbine water-wheels, which also works a force pump for supplying the tanks with water. The blasthouse (where the wind is made) is 38 feet square and 20 feet high. The castinghouse is 136 feet long, 58 feet wide, and is a 12-foot story. The stack frame is 34 feet square, and 32 feet high. The tophouse

is 34 feet square, and 20 feet high. The stack and chimney together are 65 feet in height. The bridge-house is a 12-feet story, 129 feet long, and 25 feet wide; one end resting on the ground on the hillside, the other supported by heavy truss-work, and connecting with the stack. The first coal-house connecting with the bridge-house is a 12 feet story, 148 feet long, and 38 feet wide. The second coal-house, standing a little apart from the other, is a 24 feet story, 100 feet long, and 40 feet wide. The water tank is 12 feet square, and 8 feet deep. These are the buildings which constitute the works proper; but the company has one or two other buildings in the village, one of which is a storehouse, 50 by 37 feet, and a story and a half high. The stack within, which is the furnace, is a massive pile of masonry, 32 feet square at the base, and 34 feet high. There is probably not a finer or stronger piece of masonry on this coast than this stack. The capacity of the furnace is about 800 bushels. The buildings are supplied or to be supplied with water-pipes everywhere, to be used both in the ordinary daily operations and in case of fire. Everything about the entire works is constructed for strength and duration. In this respect the company has wisely thought that the additional cost of heavy, strong, and finished work, above that of mere makeshift, cannot fail to be returned in the duration of the works. The machinery in the blasthouse is massive, and finely finished. The blast of air is obtained by the use of two large air pumps, whose pistons attach to the ends of a huge walking beam. The air is forced through a regulator, which serves to keep the current constant. In the regulator, as the machinery was driven yesterday, the pressure of air was five-eighths of a pound to the square inch. From the regulator the air is forced through a long pipe to the top of the stack, when it goes through several large cast tubes, so placed as to be all the time red-hot. This is for the purpose of heating the air before it strikes the fire and mass of ore at the bottom of the furnace. From these heating tubes the air then goes through large tubes, concealed in the masonry, to the bottom of the furnace, where it is discharged, with great force into the interior of the furnace. The effect upon the burning mass of Coal, ore and lime is something too fierce for description. To prevent the end of the air-pipe from being consumed by the intense heat, it is inserted in a massive piece of casting, called a tuier, and which is subjected to a constant stream of cold water.

"MAKING IRON. - The first casting of iron into pigs was made Saturday, August 24. The manner of doing it is something as follows: Of course the furnace has had fire in it for some time, and was hot when the work began. The workmen first put in at the top 26 bushels of coal, then 800 pounds of ore, adding to this mass about 20 percent of limestone. This proportion is observed till the furnace is full. The limestone and ore are broken under the hammer, before being put in the furnace. The use of the lime is to amalgamate with itself all the dross and impurities of the ore, released in the process of smelting. This dross is constantly drawn off from the furnace at the hearth, and when cooled is thrown away. The company propose to use it for grading their roads and grounds. When the reservoir at the bottom gets full, the hearth is tapped, the molten iron runs off in a sparkling white stream, down a channel to the pit where it falls, first, into a gutter called the sow, and from this into smaller and shorter gutters, where the iron is shaped into pigs. Yesterday the hearth was tapped twice, the result being about six tons of pig iron. It is expected than when the furnace gets formed and thoroughly heated, the company will be able to cast three times at least in 24 hours, making between three and four tons at each casting. The ore now used yields about 55 percent of iron, which would be considered anywhere in the world very rich. The coal costs about six cents per bushel. Lime costs $6 per ton. The ore is estimated to cost about $1.75 per ton. The company is now employing 80 men as miners, coal burners and heavers, teamsters and artisans, at the works. The coal-houses now have in them about 80,000 bushels of coal, and it is coming in at the rate of about 2,500 bushels per day. The iron thus far cast is pronounced by Mr. Harris, the

superintendent of the works, and by other competent judges, to be equal in quality to any made in the United States. It is very soft and very fine in grain, and it is said, might be worked into castings for machinery as run off from the furnace.

"To conclude this article, we will mention that of the first casting Mr. J.C. Trullinger, the proprietor of the townsite, has secured two pigs, which he will have engraved with his own initials, the date of casting and the trade stamp of the company, and then planted as street monuments at the corners of blocks Nos. 1 and 2, at the junctions of Furnace, Ladd and Durham streets".

"On the 1st day of October, the Oregon Iron Company had produced 224 tons of pig iron , 2,240 pounds to the ton, at an expense as follows:

For each ton (2,240 pounds) iron produced there were used-	
166 bushels charcoal, costing at furnace 8 cents	$13.28
884 pounds lime, costing at furnace 40 cents	3.53
4,970 pounds ore, costing at furnace $2.50 per ton	5.50
Labor reducing each ton	6.67
Total cost of the pig on bank of river	$28.98

"This does not include interest on capital, or state and county taxes.

"A sample of this metal was received at San Francisco August 30, 1867, which, after thorough tests by the various foundries in that city, was pronounced a superior article.

"The average cost of importing pig iron from Europe to San Francisco is about $40 per ton, ranging from $35 to $45; the fluctuation arising from the rates of freight, which is usually from $12.50 to $15 per ton. Occasionally it is brought by French and German vessels at a lower price, as these vessels generally carry cargoes of light merchandise, which require heavy freight as ballast. The usual freight from Atlantic ports is from $12 to $16 per ton in currency.

"Within the past year small parcels of pig iron have been received from Australia. The Australian iron costs about $40 per ton in gold, delivered on the wharf".

Footnote: 1 bushell of charcoal weighed 16 lbs. Therefore 125 bushells weighed 1 ton. 125 bushells @ $.08 = $10.00 a ton.

NOTES ON OSWEGO IRON.

Although the first iron blast furnace together with the first iron ore smelted on the Pacific Coast was in 1867 as described above, Bancroft states that the "first iron founding" in Oregon was in 1858 when Davis and Monastes of the Portland and Willamette Iron Works of Oregon City built engines and machinery for a saw mill. The source of the iron used is not given. Presumably pig iron shipped in was used in the foundry.

The original Oswego furnace was used more or less continuously from 1867 to 1886. No production is of record for 1886 or 1887. Old Man Obsolescence caught

up with them, for a new blast furnace of a then modern type was built, and production resumed in 1888. Foundations for the latter are seen now on the Willamette just south of the junction of the creek and river, while the old original furnace is just north of junction. The record of iron production ceased after 1894. Mineral Resources of the United States give the highest annual production for the company as 10,987 long tons in 1890. The highest annual production for the old furnace was 6,250 long tons in 1883.

This enterprise represented courageous industrial pioneering and was, in its inception and early activity, of major importance, not only to Oregon but to the whole Pacific Coast. Throughout its long life, particularly during its early years, the project contributed greatly to the progress and upbuilding of the State. For these reasons it would be highly desirable to preserve the old furnace as one of the important landmarks of early Oregon history. Should the old furnace be demolished to make way for a building project, a historic monument will be lost. Here is a spot which should be marked and commemorated by the Society, and the suggestion is made that steps be taken to that end by conferring with the Ladd Estate, owners of the property.

F. W. Libbey

****

Bulletin 922-D, Chromite deposits of Grant County, Oregon, a preliminary report, by T. P. Thayer. 1940. pp. i-iv, 75-113, pls.12-20, figs.12-19. Price 45 cents.

The principal chromite deposits of Grant County, Oregon, occur in belts of peridotite and dunite, largely altered to serpentine, in the Strawberry Range. A few deposits have been found in the Greenhorn Mountains. The most productive mines are east of Canyon City in comparatively fresh ultramafic rocks in which the original mineralogic and textural characters are well preserved. The borders of the mass are pyroxenitic, and the chromite deposits occur as irregular lenses in the less pyroxenitic and more dunitic central part. The chromite appears to be genetically related to dunite and is probably of early magmatic origin. Most of the readily accessible deposits of high-grade chromite have been worked out, and future production will be predominantly from low-grade concentrating ore containing from 15 to 30 percent of chromic oxide. The known reserve in the explored deposits is about 80,000 tons of ore averaging between 20 and 35 percent of chromic oxide. With sufficiently high prices, probably 200,000 tons of concentrating ore averaging between 20 and 25 percent of chromic oxide could be mined from explored deposits in Grant County. The report contains a geologic map of the chrome-bearing area on a scale of 1 mile to the inch and detailed geologic maps of the chromite bodies on a scale of 50 feet to the inch. It is the fourth chapter of "Strategic minerals investigations, 1940".

****

GEOLOGICAL NEWS LETTER

VOL. 6 NO. 23 PORTLAND, OREGON Dec. 10, 1940

OFFICIAL PUBLICATION OF THE

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POSTMASTER: Return Postage Guaranteed

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Executive Board

J. C. Stevens	President	434 NE Royal Court
A. W. Hancock	Vice-Pres.	2704 SE 84th Ave.
Miss Rose Jennings	Secretary	609 SW Lincoln St.
Miss Helen Iverson	Treasurer	5125 NE Couch St.
Clarence D. Phillips,	Director	
Ray C. Treasher,	Director	
Carl P. Richards,	Director	
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_____
Address

_____
Business Address

_____ _____
Telephone Number Occupation

I am particularly interested in the following branches of Geology: _____

_____

Sponsored by: _____
Member

I enclose $_____ for first year's dues, March 1 to March 1. (Make checks payable to the Society).

_____
Signature

ANNOUNCEMENTS

ALL LECTURES HELD IN AUDITORIUM, PUBLIC SERVICE BUILDING, 6th & Taylor

DATES TO MARK ON YOUR CALENDAR

Thursday Dec.12 — Luncheon at The Orange Lantern

Friday Dec.13 — Subject: GEOGRAPHICAL AND GEOLOGICAL SKETCHES OF PERU.
Speaker: Earl K. Nixon.
Mr. Nixon, director of the State Department of Geology and Mineral Industries, has recently returned from another trip to Peru, where, owing to the official nature of his work, he was enabled to see much that the most diligent tourist observer would miss. His talk will be illustrated with slides of photographs taken by Mr. Nixon in natural color, which will serve to show much of the geography and culture of the country.

Sunday Dec.15 — Local Interest Trip. Leave SW Front Ave. and Yamhill St. at 9:00 a.m.
Maps: Portland, Troutdale, Oregon City and Boring quadrangles.
Proceed to 92nd and Division and thence to Powell Valley Road by way of 92nd Ave. See old scour channel around Kelley Butte. Visit quarry that turned into a gravel pit.
Continue south on 92nd ave. to Foster Road, thence to 100th Ave. and south to Indian Rock quarry on Mt. Scott. A recent lava flow on the gravels of this area.
Thence to the top of Mt. Scott (walk 1½ miles if road is skiddy). This is a view stop which will be passed if visibility is poor.
Thence west around the south side of Mt. Scott to 82nd, south to King Road and west along King Road to gravel pit. The stream that made this deposit was flowing from the north.
Continue west to Linnwood Road and turn south. The road crosses an old abandoned channel lake, hanging on a terrace along Kellogg Creek.
Thence east by way of Harmony School to 82nd, south on 82nd to Lawnfield Road and east on Lawnfield Road to its end. Lunch. Visit cave in lava flow, see an interesting landslide, and examine some old wells on the side of a mountain.
Thence to Carver. Examine lavas and gravels.
Thence to Grant Park on the Clackamas River. Visit the Indian Caves.
Disband. About 45 miles of driving.
Leader: Mr. Amza Barr.

Thursday Dec.19 — Luncheon at The Orange Lantern.

Thursday Dec.26 — Luncheon at The Orange Lantern.

Friday Dec.27 — Subject: THE CALL OF THE STARS.
Speaker: Robert E. Millard, Portland astronomer and variable-star observer. A non-technical talk by Portland's leading student of the stars on a subject of universal interest. Mr. Millard will exhibit a model to demonstrate the motion of the planets about the sun, and will tell us something of the mythology and history connected with studies of

the stars in their courses. The nature of CUNNINGHAM'S COMET, current-nearing the earth and visible to the naked eye under favorable conditions, and other comets, will be discussed. Come prepared to ask questions.

Thursday Jan.2nd — Luncheon at The Orange Lantern.

Thursday Jan.9th — Luncheon at The Orange Lantern.

Friday Jan.10th — Subject: SIERRA PEAKS AND VALLEYS.
Speaker: Mr. James Stovall, Department of Geology, University of Oregon. The Sierra Nevada region contains some of the world's finest scenery, in addition to being of major geologic importance historically and economically. Mr. Stovall will present a series of beautiful natural-color slides to illustrate his lecture, covering such points of interest as Mt. Lassen, Yosemite National Park, and Death Valley. This is our first opportunity to hear the geological story of Mt.Lassen, our most-recently active volcano.

Sunday Jan.12th — Tentative Date. Visit the laboratory of Mr. Jack DeMent, who spoke before the society on radioactive minerals. This should be a Red Letter Day in trip history. Details and exact date will be given as early as possible.

Sunday Feb.16th — Another Local Interest trip. Details later.

****

CHANGE OF ADDRESS

Mr. and Mrs. Carl Richards	530 N.19th St.	Salem, Oregon

NEW MEMBER

Robert McGilvery	146 N.21st St.	Corvallis, Oregon

****

ADDITION TO OUR LIBRARY

Mr. Libbey has presented us with the October issue of Mining Congress Journal, in which appears his article entitled "Oregon's Quicksilver Industry".

****

SALEM CHAPTER ANNOUNCEMENTS

LECTURES are held in Waller Hall, Willamette University, Salem.

TRIPS are conducted in "caravan" style. Suggested reimbursement to car drivers is 1¢ per mile. Lunch should be taken and the leader will designate a suitable place, during the trip, for eating it.

LUNCHEONS - Members and friends meet each Tuesday at noon in the Golden Pheasant, Liberty St. near Chemeketa; lunch 40¢. Geological specimens are exhibited; brief talks on experiences are welcomed - an excellent opportunity to get acquainted.

****

Tuesday Dec.10 — Luncheon at The Golden Pheasant.

LECTURE Thursday Dec.12 8 p.m. — Subject; OREGON IN THE GEOLOGICAL STORY.
Speaker: Professor Herman Clark, Willamette University
President, Salem Chapter.
This is to be a review of the fundamentals and terminology of geology which prevail more or less the world over, but Professor Clark will make them clear to us by citing examples of the various formations and processes here in Oregon. As an introductory lecture of the series to which Salem Chapter looks forward a better topic could not be chosen. To members who are not yet familiar with the subject it affords an excellent opportunity to lay a sound foundation. To others who have explored in various geological realms it will doubtless polish up some of the rusty spots in their acquaintance with the fundamentals.

TRIP Sunday Dec.15 — Professor Clark will lead a trip to SILVER CREEK FALLS STATE PARK
Meet on State St. opposite Waller Hall and the Capitol.
Start at 8:30 a.m., returning to Salem by 3 p.m.
Driving distance, about 60 miles.
We will drive directly to the Park via Silverton. First stop will be at the North Falls parking plot, proceeding from there to Winter (Dry) Falls. At this point a general explanation and description of the geology of the Park area will be given. From there the party will cross to the Upper South Falls, where they will go behind the falls and view the unconformity at the base of the lava, as well as some interesting tree casts. From this point a hike will be made to the Lower South Falls. On the return to Salem a quarry will be briefly visited.

Tuesday Dec.17 — Luncheon at the Golden Pheasant.

Tuesday Dec.24 — Luncheon cancelled on account of proximity to Christmas.

****

SALEM CHAPTER PRESENTED WITH CHARTER

The evening of November 28th, 1940, was a memorable one in the annals of the Geological Society of the Oregon Country. About twenty-five members from Portland journeyed to Salem, in a downpour of Oregon mist, to officially recognize the formation of the first chapter. Faculty members from both the University of Oregon and Oregon State College were also present to assist in formally welcoming the local group who had expressed a desire to organize and affiliate with the Portland Society.

The meeting was held in the auditorium of Waller Hall on the Willamette University campus. Herman Clark, professor of geology at Willamette, and temporary president of the Salem group, presided.

Dr. R. Franklin Thompson of Willamette University, officiating for President Baxter who was out of town, extended a welcome to the group and assured them of the full cooperation of the facilities there.

Mr. J. C. Stevens, president of the Geological Society of the Oregon Country, was introduced first, and, after a short resume' of the beginnings of the Society, he welcomed the Salem group and formally presented them their charter, which had been suitably engraved for the occasion.

Dr. E. L. Packard, dean of geology, Oregon State College, gave a short talk on the searching for and collecting of fossils, with special emphasis on the aid amateurs can give the paleontologist . He was followed by Dr. Warren D. Smith of the University of Oregon, who also told of the work amateurs have done in the realm of geology, citing in particular John Muir, also Leonardo da Vinci and a medical doctor in the Midlands of England.

Dr. Ira S. Allison of Oregon State College remarked that a pep talk was not necessary for either the Salem or the Portland group as the attendance was sufficient evidence of geological interest and Dr. H. B. Staples of the University of Oregon reiterated Dr. Allison's remarks relative to developing enthusiasm; he also enlarged on Dr. Smith's statements regarding amateurs. As his field is mineralogy he brought out the fact that, even now, new minerals are being discovered by amateurs.

The academic end being taken care of, Prof. Clark introduced Mr. Earl K. Nixon, Director of the State Department of Geology and Mineral Industries. Mr. Nixon stated that he belonged to the practical end of the business, but that any aid the Department could give would be available. This, in addition to the proffer of aid from both the University of Oregon and Oregon State College leaves no loophole for confusion in identification or lack of information on questions arising in the future.

Mr. Arthur Piper, of the United States Geological Survey, represented the government. He told of experiences he had when he gathered his first geological specimens. That was when he was still in the stage of collecting anything and everything. Discrimination, he said, is necessary and one eventually reaches that stage.

Communications were read from Dr. Hodge, of Oregon State College and founder of the G.S.O.C. and from Dr. Francis T. Jones of Pacific University, who were unable to be present. They both expressed confidence in the future of the Salem chapter .

When the formal meeting ended the audience was invited upstairs to view the Willamette University Museum, which is quite extensive and well organized. In a

lecture room adjoining the museum, light refreshments were served. At this time the opportunity to sign up was given to all who wished to become members of the newly formed Chapter. Twenty-three applications for membership were received.

LIST OF CHARTER MEMBERS -- SALEM CHAPTER.

Archibald, R. L.	Franklin, W.C.	Miller, J.H.	Richardson, W. E.
Bradley, B. L.	Hatfield, Mrs.D.O.	Minar, E. L.	Smith, H. J.
Carr, Vivian F.	Heuperman, L.F.	Moorman, Mark	Smith, J. E.
Chase, O. A.	Hill, V. D.	Packard, E. L.	Stephenson, M.
Clark, Herman	Hubbs, N. C.	Peterson, R. W.	Stewart, E. K.
Dahl, Olive M.	Libby, H. W.	Pfifer, C. E .	Tavenner, R. W.
Doughton, Wayne	Lister, H. L.	Rice, Dorothy R.	Ward. C. C.

Also the following who were previously members of the G.S.O.C.-

Davis, Franklin L.	Richards, Carl P.
Paxson, G. S.	Stockwell, Mrs.H.Mildred
Reeves, W. A.	Van Scoy, Paul

****

Waters, Aaron Clement; Flagler, Charles W.; and Fuller, Richard Eugene. Origin of the Small Mounds on the Columbia River Plateau: American Journal Science, 5th Series, v.18, no.105, pp.209-224, 8 figs., 2 tbls., bib.; Sept. 1929) OrP

Mounds of Columbia R. Plateau have a common origin, erosion remnants of a once continuous layer of volcanic ash, and developed only when deposited directly on basaltic surfaces. There must be some slope to surface and mounds are elongated in direction of slope, the amount of elongation is a measure of steepness. Mound topography not observed where ash is 7' in thickness. Mounds do not indicate climatic change (RCT)

****

COMMITTEES APPOINTED

1203 Spalding Building, December 5,1940.

O. E. Stanley — Emma Nordgren
Tracy Wade — Mildred James
A. D. Vance, Chairman

I will appreciate it if you will serve as a nominating committee to name one canditate for each office of this society for the ensuing fiscal year beginning March 1, 1940.

The offices to be filled are: President, Vice-President, Secretary, Treasurer, and one director in place of Dr. Hodge, whose term expires this year. Mr. Treasher's term as Past President on the Board also expires and I succeed him automatically.

Your report should be submitted to me not later than January 3, 1941.

If for any reason either of you can not serve will you please phone me at AT 8701.

Sincerely,

J. C. Stevens
President.

jcs/l

* * *

Louis E. Oberson, Chairman	Margaret Reid
J. Martin Weber	Dr. David Weber
Kenneth Phillips	Mrs. R. R. Poppleton
Mrs. Edward Boyrie	Emily Marshall
Myrtice Fowler	Mrs. L. E. Kurtichanof
Earl B. Kellmer	Mrs. A. W. Hancock
Thos. A. Carney	John Allen
Hannah E. McLeod	Lloyd Ruff

I will appreciate it if you will serve as a special committee on program for the annual banquet which will doubtless be held at Reed College Commons March 14, 1941.

While I have named only one member of the family above, it is understood that if there are other members of the family who are willing to serve, they will also be considered as committee members.

If either of you can not serve, will you advise me as early as possible at AT 8701.

Sincerely,

J. C. Stevens
President

jcs/l

December 6, 1940.

Dear Jim:

Were you ever in a group of people where there was an undercurrent of exceptionally fine spirits ready to bubble over at the slightest break? Luncheon last week had those symptoms. You could actually feel it. There were thirty-seven present, several of whom were guests. Miss Jennings had as her guest Mrs. Lois McLane. Mr. Hancock brought Mr. Miner who hadn't been present before, and John Allen presented a new metallurgist for the State Board, James A. Adams. Barney Macnab was present for the first time and everyone was certainly pleased to see him.

There were a number of specimens and Tracy Wade started the ball rolling with a well preserved rodent skull from Fossil Lake.

Grace Poppleton and her mother were in Santa Fe this past summer and while there visited the oldest turquoise mine in New Mexico. They had a piece of the ore and a turquoise ring.

Mr. Vance had been hunting fossils near Castle Rock which is of Eocene age and showed two fossils - a big oyster and a little oyster.

Mr. Hancock in exchange for a gingko leaf sent to the Cranbrooke Institute had received some copper ore. The pieces were interesting as they showed copper in various forms.

Tom Carney had some beautiful plume agate that he had dug up in eastern Oregon after digging unfruitfully for six weeks before.

This last week Jane Hurst was present for the first time.

Miss Jennings was unable to be present as she is laid up with a cold so, as Mr. Nixon came in late, Mr. Stevens asked him to sit at the head along with himself and Mr. Carney. Mr. Nixon accepted but did inquire as to what he as accused of to be placed there.

Dr. Arthur Jones had a piece rock from Mt.Hood one of his patients had given him. It was either tuff with pyrites or something which had undergone hydrothermal action. The patient who gave it to him thought it might show gold and he would probably get rich quick. Various ones laughed at this statement but Mr. Nixon squelched them by saying it could be possible and that an assay was the only sure method of determination.

John Allen had some crabs and a leaf fossil from the Dallas Lime quarry. Dr. Jones had apologized for having an uncut and unpolished specimen and the professionals generally had nice ones. But John went him better as his were rough pieces and larger than Dr. Jones'. Tom Carney put them both to shame with a lovely specimen of Millerite in calcite in a very nice case. The golden threads of the millerite were, to say the least, unusual.

Mr. Miner had a specimen of rock from Goldendale which had lovely red tones. I understood that it was jasperized wood but I'm not sure. It would make a lovely fireplace - that is, if you had enough of the rock to make a fireplace.

This is a short letter but Christmas is creeping up on us and I've just begun to get the spirit of the season.

Katie.

****

WE NEED A MUSEUM

An article in the Rutgers University Bulletin recently received by R. L. Baldwin again emphasizes the greet need there is in Portland for a museum of natural history.

The article states that the mineral collection of Mr. George Rowe of Franklin, New Jersey, has just been given to the university. This mineral collection known as one of the finest privately owned collections in the United States has been built up by Mr. Rowe while he was for many years superintendent of the New Jersey Zinc Company mines at Franklin. It contains over 2800 pieces, and includes some 120 pieces of the rare Franklin material, some of these found in the early days of the history of the mine and not seen since. Thirty of these have been found only in the Franklin area.

The writer remembers with great pleasure the Sunday morning vist the Booth family made to the Rowe home last summer when in Franklin, and the kindness with which they were received by Mr. Rowe, while being shown his wonderful collection.

Now why don't we in Portland get a museum started so we may be in line for similar gifts from philanthropic collectors?

C. L. Booth.

****

GEOLOGICAL TRIP OCT.27th, 1940.

The personnel that participated in this enjoyable trip consisted of two geologists, the leader, the scribe and one interested observer. It was found that this was a large enough party to have an interesting and educational trip.

The start of the expedition was at the lower end of the Germantown road just above the south end of the St.Johns bridge. A few rods above the bridge a road cut was first examined. The lower part of the cut consisted of gravels which the leader pronounced to be Troutdale formation. Neither of the two geologists questioned this statement so the scribe decided that it was geologically correct. It was noted that the gravels here contain many quartzites varying in size not much larger than a pea to the size of a goose egg all well rounded by the action of water. The gravels are overlain with a lava rock presumably Columbia River basalt.

At this point the interested observer began to ask questions as women will. She wanted to know the age of the Troutdale formation and whether it was pleistocene or not. The scribe was busy with his notes, the two geologists were discussing botany so that left it to the leader to say that it is Pliocene. The two geologists made no objection so we assume that is correct. More explorations were made in the vicinity but nothing of note was found.

The party then drove on up to the Skyline Boulevard and on out into Washington County, finally stopping at the Jackson Creek road quarry near Helvetia. At one time, so the leader averred, this was the location of Jackson Creek Falls but since so much road material has been taken out of the quarry the falls have disappeared.

The crew that works the rock crusher for the qurry were having the day off so we had the whole thing to ourselves and could prospect and break rocks all we wanted to. Plenty of heavy sledges were lying around and one of the party used one of them so adeptly that it would appear that he had previous experience in making little ones out of big ones.

The quarry rock seems to be for the most part a vesicular basalt with many of the vesicles of an unusually large size. Some discussion arose at this point as to whether the water that many of these vesicles held was acid trapped in the rock during its formation or whether it was ground water which had percolated in later. Neither of the two geologists having any litmus paper to verify the acid theory, it might be said in regard to the controversy that the jury is still out.

Some very nice zeolite crystals were found in some of the vesicles and geologist no.1 opined that they were deposited through hydro-thermal action in the hot lava. Some pelagonite was also found on the testimony of geologist no.1. This decision was also taken at its face value by the scribe as he lays no claim to being a pelagonitist.

After all this heavy geologizing it finally occurred to the party that it was feed time for the inner man for after all even a geologist must eat even as you and I. A fire kindled on the floor of the quarry served as a source of warmth and also as a means to toast sandwiches.

A little more rock crushing after lunch and then the party strolled up the rocky bed of Jackson Creek for a distance to several cascades and a low waterfall, a beautiful spot with many kinds of lovely ferns growing luxuriously along the banks of the stream.

We came back to town by the way of McKay Creek and noted the landslide topography but stopped only briefly. A little discussion of the coming election and it was voted that it had been a fine trip, ably led, with plenty of geologists and enough observer for a quorum.

- H. L. Jennison

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Weaver, Charles Edwin.
Geologic Structure in Western Washington (abstract, Geological Society America, Bulletin, v.26, pp.135-136, 1915). OrP OrU OrCa

Geologic structure in W.Wash. consists of 3 nearly parallel predominant upwarps and 3 intervening downfolds extending from Cascade Mtns. to Pacific C. Major and Minor anticlinal and synclinal folds have been developed parallel and transverse to these. Predominating trend of folds in W½ of state and Vancouver Is. is approximately N.60° W. Minor folds on flanks of major folds are nearly N and S, Initiation of movements producing such structure appears to have been at or near close of Jurassic. Intensified toward close of Tertiary. Discussion. Relation between NW-SE axes of folding and Cascades uplift, corresponding to pre-sierran deformation and Sierras faulting in Calif. region, formed contemporaneously and as parts of same general movement. (RCT)

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VOL. 6 NO. 24 PORTLAND, OREGON Dec. 25, 1940

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Address

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Business Address

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Telephone Number Occupation

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_____

Sponsored by: _____
Member

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_____
Signature

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DATES TO MARK ON YOUR CALENDAR

THE EDITOR AND HIS STAFF WISH YOU ONE AND ALL, A MERRY CHRISTMAS AND A HAPPY AND SUCCESSFUL NEW YEAR!

****

Thursday Dec.26 — NOTE THIS CHANGE IN MEETING PLACE FOR OUR NEXT TWO THURSDAY LUNCHEONS! AS OUR ROOM AT ORANGE LANTERN IS BEING RE-DECORATED, WE WILL MEET FOR LUNCHEON DOWNSTAIRS AT THE IMPERIAL HOTEL.

Friday Dec.27 — Subject: THE CALL OF THE STARS.
Speaker: Robert E. Millard - Portland astronomer and variable-star observer. A non-technical talk by Portland's leading student of thestars on a subject of universal interest. Mr. Millard will exhibit a model to demonstrate the motion of the planets about the sun, and will tell us something of the mythology and history connected with studies of the stars in their courses. The nature of CUNNINGHAM'S COMET, current-nearing the earth and visible to the naked eye under favorable conditions, and other comets, will be discussed. Come prepared to ask questions.

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Sunday Jan.12 — Watch daily papers for this trip, as the trip to laboratory of Mr. Jack Dement has been cancelled.

Thursday Jan.16 — Luncheon - Orange Lantern.

Thursday Jan.23 — Luncheon - Orange Lantern.

SALEM CHAPTER ANNOUNCEMENTS

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TRIPS are conducted in "caravan" style. Suggested reimbursement to car drivers is 1¢ per mile. Lunch should be taken and the leader will designate a suitable place, during the trip, for eating it.

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****

No announcements from Salem Chapter of lectures or speakers have been received, at time this bulleting went to press.

****

CHANGES IN ADDRESSES AND TELEPHONE NUMBERS

Mr. and Mrs. E.N.Bates	BE 6925	5639 SW. Menefee Drive.

NEW MEMBERS OF SALEM CHAPTER

Mr. and Mrs. J.L.Kennedy	405 Division St., Salem, Oregon.
Mr. Wayne F. Tate	1133 Chemeketa St., Salem.
Dr. & Mrs. Ira F. Allison	Corvallis, Oregon.
Mr. & Mrs. Andrew A. Holl	1570 Market St., Salem.
Mr. & Mrs. Lloyd L. Robinson	1025 N.17th St., Salem
Mr. Richard Sneed	2505 Brooks St. Salem
Dr. & Mrs. J.Vinton Scott	744 N. Capitol St., Salem
Mr. & Mrs. Ralph H. Mitchell	Royal Court Apts., Salem
Madeline K. Hanna	550 N. Summer St., Salem.
Mr.& Mrs.Theo.W.Olson	Route 5 Box 271, Salem
Alice Riggs	280 South 19th St., Salem

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DOINGS OF OUR MEMBERS

C.P.Holdredge has been employed by the State Department of Geology & Mineral Industries to make a canvass of non-metallic mineral production in the state for 1940. Statistics of metallic production made by the U.S.Bureau are accurate and made available to the public with reasonable promptness. The Bureau's figures for non-metallics, however, are not complete for Oregon and are often delayed two years before being published.

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Geological Society of the Oregon Country

CHARTER

Salem Chapter

To all whom it may concern:

Know ye that we, the Geological Society of the Oregon Country, have authorized and empowered, and do hereby authorize and empower Herman Clark, President, G. S. Parson, Vice-President, Mrs. W. A. Reeves, Secretary, Mrs. H. Mildred Stockwell, Treasurer, and also as directors, and Miss Vivian Carr, Franklin L. Davis, Winston Purvine, W. A. Reeves, and Carl P. Richards, as directors at large, to form and hold a chapter designated as Salem Chapter of the Geological Society of the Oregon Country, at Salem, in the State of Oregon.

And we do further authorize and empower the said chapter to admit members thereto and conduct its affairs in accordance with the Articles of Incorporation and the By-Laws of the Geological Society of the Oregon Country;

And we do further authorize the persons above named to install their successors in office, after being duly elected and chosen; to invest them with the powers of their respective offices, and to deliver them this charter; and such successors shall in like manner install their successors.

Provided, however, that the officers and members of said chapter shall comply at all times with the Articles of Incorporation and By-Laws of the Geological Society of the Oregon Country, as they may now or hereafter exist; otherwise this Charter to be of no force or virtue.

Given under the hands of the officers of the Geological Society of the Oregon Country and the Seal attached hereto this 22 day of November, 1940.

PRESIDENT	VICE-PRESIDENT	SECRETARY	TREASURER
DIRECTOR	DIRECTOR	DIRECTOR	
DIRECTOR	DIRECTOR		

December 21, 1940

Dear Jim:

Merry Christmas to you all. Between Christmas shopping and finishing up the things I started to make I've been so busy that this letter won't be so long winded. The Geological Society always has my interest tho and everything else is put aside when they have meetings and luncheons.

The luncheon meeting a week ago had quite a few specimens presented. Tom Carney had most magnificent specimens of malacite and azurite in malacite. These specimens were from the Bisbee Mine and were taken out forty years ago. Mr. Carney said that malachite is a pseudomorph after azurite.

Mr. Minar showed a polished specimen of Labradorite from Norway which is beautiful. The light brings out fascinating colors and reflections.

Dr. Booth had a piece for identification and the experts decided on stilbite.

Miss Hughes had as her guest little Miss Sharon Clark.

Dr. Booth, bringing up the idea of Christmas giving, referred to three books originating in Oregon. Horse and Buggy Essays by Mr. Brand; Frontier Doctor by Dr. Coe; and the Oregon End of the Trail, travel book put out by the W.P.A.writers project. This travel book we have and as we are trying to explore Oregon by degrees we have found it quite handy.

To cap the climax, Mr. Vance told 'bout practically running over a large mule deer out on Skyline Boulevard. Those present tried to tell him there weren't any such a thing as a mule deer in the Coast Range. But Vance stood his ground saying that it jumped as high as a door in clearing a fence and was at least as big as a cow. This, of course, left him wide open for the remark that 'mebbe' it was a cow. Mule deer do stray tho - so could be.

This week at the luncheon, in spite of rain and flu, there was a nice crowd. Miss Jennings still is under the weather but I'm sure she is recovering nicely. Miss Nelson and Miss White, taking advantage of school vacations, were present, and Miss Nelson had as her guests Mr. and Mrs. Hatten of Salt Lake. This statemen is misleading as Mr. Hattan although now with the Department of Interior in Salt Lake is an Oregonian.

Dr. Arthur Jones who, as he explained, received rocks from pateitns who know he is interested had a specimen of vescicular basalt from Lake County with blue inclusions. The final decision was that the inclusions were copper stain.

Dr. Booth had a clipping from a Houston, Texas, paper relative to a geological convention to be held there by the Geological Society of America at which a thousand geologists were expected. That is a lot of geologists in one place.

Captain Leslie L. Motz was present as Mr. Libbey's guest. He is now doing his year of training but ordinarily is a metallurgist with the State Department of Geology and Mineral Industries.

John Allen presented Paul A. Howell who is also a geologist and a long-time member of the GSOC, but who infrequently is able to attend either the meetings or the luncheons.

Dr. Jones presented with much pleasure his daughter Ardis.

Respect was paid to the memory of Mr. E. S. Collins who had led a long well-rounded life and who was interested in the work of the Geological Society.

The main event of the luncheon was a brief talk by Mr. Nixon's guest, Dean A. E. Drucker, Director of Electro-metallurgical and Research Laboratory of the State of Washington at Pullman. Dr. Drucker told the group of the work done by his laboratory and told it so convincingly that even I knowing nothing of physics, chemistry, or metallurgy, was fascinated. Dr. Booth commented to me afterwards that I quite taking notes on his talk, but it was beyond me and I was afraid I'd tell it all wrong. Dr. Drucker really had to be heard to appreciate his knowledge and enthusiasm.

Well, -- Christmas is practically on us and I've lots to do - so again - Merry Christmas to you all.

Katie.

TIN

In National Geographic Magazine for November, Alicia O'Reardon Overbeck traces the history, occurrences and production of tin under the title "Tin, the Cinderella Metal". It is needless to state that the article is illustrated adequately. That is taken for granted in National Geographic.

Historically tin goes back into antiquity. Biblical references are numerous. Its industrial importance dates from the time when an ancient metallurgist discovered that by adding tin to molten copper the resulting alloy possessed greatly desired properties of hardness and strength. The Bronze Age resulted which meant a step or several steps forward in the social conditions called civilization. The end of the Bronze Age came with the discovery of iron, but that did not mean a lessening in the importance of tin, for its uses have continually expanded.

The fabulous voyages of the Phoenicians are connected with commerce in tin, probably with ancient Britons in Cornwall, famous for its tin mines. On down through the ages, the Bible, Herodotus, Pliny, Homer, writings of ancient Chinese and Egyptians, and the more modern writers which seem ancient to us now, mention tin or its alloys such as bronze, pewter and bell metal.

Known commercial occurrences of tin are really confined to a relatively few localities - the Federated Malay States, the Netherlands Indies, Bolivia, Siam (Thailand), Burma, China, Nigeria, and Cornwall. It is thus remarkable that it was one of the first metals discovered.

The romance of tin is intimately associated with early explorers and adventurers. Pizarro conquered Peru, and he and his associates gutted it and Bolivia, insofar as they were able, of all treasure. On Potosi Hill, Bolivia, in the 17th century, rich silver ore was mined through shafts by thousands of salves - human ants - who passed endlessly up the notched poles used as ladders, each with a load of silver ore on his back. His life was valued about on a par with the ants. When he fell exhausted or made a misstep in the shafts, another slave was forced in to replace him.

Tin ore which occurred with the silver was thrown away as worthless and accumulated in huge dumps; it was not until the next century that tin in the dumps became of commercial importance. These dumps have continued to be worked over for tin minerals down to the present day.

Not all the dramatic stories of rags to riches are confined to gold mining or wild-cat oil wells. One of the most spectacular is that of the rise of Senor Simon I Patino, the Bolivian Tin King. As related in National Geographic, in the early part of the last century Patino was a young, impecunious clerk in a general merchandise store, owned by a German, in Chochobamba. Heavily in debt to the store was a Portuguese, and it devolved upon the clerk to collect the debt. After tracking down the debtor which much effort and difficulty, Patino finally made with the Portuguese the best bargain he could, which was that the Teutonic proprietor should accept title to a tin claim the Portuguese owned in settlement of the bill for merchandise. However, Patino's employer was enraged at the bargain and threw him out on his ear, telling him to keep the tin claim in

payment for back wages. Without a job and with no money the clerk turned to the tin claim as a means of livelihood. A friend staked him to some food and tools, and he started work. For many months he endured hardship and privation. With some Indians to help him, he mined the ore and concentrated it in the icy streams, packing the concentrate out on his back. Finally he struck some rich ore valued at over $500 a ton. It proved a real strike and soon he received an offer of a million dollars for his property. Counseled by his wife, he refused the offer. By mining his rich ore he was able to buy surrounding property which also proved to have valuable tin deposits. The Patino mines today supply about half of Bolivian tin production, and the Patino fortune is one of the world's largest.

The history of canning food really begins with Napolean's determination to solve the problem of providing portable food. He offered a reward of 12,000 francs to anyone who could devise a satisfactory method. Nicholas Appert, after many experiments, discovered that by heating and sealing, foods could be preserved. But he knew only of glass as a container which was not practical for use of an army on the march.

Knowledge of tin plating goes back to antiquity. In more recent times, tin plate was made in Bohemia and Saxony between 1240 and the 1600's. A plant was started in England in 1673. In 1720 the industry was started in Wales, and by 1776 Wales led the world in tinplate manufacture. Wales maintained its leadership until the industry in the United States took over because of the McKinley Bill of 1890.

In 1825, an Englishman, Thomas Kensett, living in New York, obtained an American patent for a tin can to be used as a container. In 1810 a patent had been granted in England. From these beginnings has sprung an industry which now uses around 50,000 tons of tin annually in the manufacture of tinplate.

We take the tin can for granted without giving thought to its importance in our scheme of things, but if we pause a bit and think about our reliance on it for making possible the various human activities of the present day, the tin can then assumes gigantic proportions. We then realize something of our dependence on the metal tin.

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In Metals and Alloys for November, under the title "Tin Plate and Solder - from the Strategic Viewpoint", H. W. Gillett gives some timely facts about United States' requirements of this much publicized metal.

The tin content for finished products in the United States for 1937 was about 90,000 tons of which 73,000 tons was primary and 17,000 tons secondary metal. About 39,000 tons, all primary, was used in tinplate.

The most important use of tinplate is in tin cans for food products, in which industry about 60% of all tin cans are used. In cans used for food containers, the tin coating serves three purposes, (1) protection from rusting of outside (2) protects inside from corrosion by contents (3) allows soldering of the body seam with great facility in can-making machinery.

Under war conditions, the amount of tin used in cans could be reduced very

materially without cutting down the number of cans required. Lacquer-enamel can be used for protection on the outside of cans. Also a large number of oils, dryfoods, and non-corrosive materials do not require tin for protection; "enamel" lined cans could be used. It is estimated that not more than 10% of the total cans made require tin for protection against corrosion due to contents.

In an emergency, silver might be substituted for tin in the food industry where protection against very corrosive materials is desired. Generally speaking silver would be uneconomic. Aluminum could not be used, since no solution of the problem of soldering on aluminum has been found.

The most essential need for tin is in soldering tin can joints. If required by shortage of tin, it would be feasible to tin and solder only the joints, thus saving the tin on about 95% of the area.

The use of solder is so varied and widespread that it affects nearly all industrial activity. In a 4,000,000 car year, about 9,000 tons of tin is required for radiators.

Some substitute solders which could be used under certain conditions are lead-silver and cadmium-zinc combinations. Also, a solder may be made by substituting cadmium for some of the tin in the usual 62% lead-38% tin solder.

* * *

In U.S.Bureau of Mines' Mineral Trade Notes, dated Nov.20th, 1940, the following item shows measures taken in the United Kingdom for conserving tin supplies:

> "The Ministry of Supply has issued an order prohibiting the use of tin containers for face powders, shaving sticks, cigarettes, boiled sweets, and many other articles. The Ministry hopes thus to save approximately 50,000 tons of tinplate and sheet steel per annum, which can be diverted to the manufacture of munitions. In the case of biscuits, boiled sweets, coffee, cocoa, and drinking chocolate, retailers will receive supplies in large tins, which will have to be returned to the manufacturers after the contents have been sold to the public in small paper containers. Tin boxes and cans in general will be replaced by paper containers and bags. The public is urged to return all used tin cans at once to retailers or other authorized persons or agencies. (Vice-consul M.A.Colebrook, London, July 25, 1940)."

- The Ore.-Bin, December 1940.

CAMBRIAN SEA OF WESTERN PART OF NORTH AMERICA.

About 450,000,000 years ago a shallow sea about 500 miles wide reached from the Arctic Ocean to Lower California.

High land in about the position of the present Sierra Nevada Mountains was its western shore. On the east it was bounded by a lower terrain of which the granite cores of some of the ranges in the present Rockies such as the Wind River, Teton, and Bighorn Mountains are surviving relics.

Into embayments of this ancient sea this summer went Dr. Charles E. Resser, Smithsonian Institution paleontologist, in search of fossils of the primitive creatures who lived in its clear waters. From these fossils can be reconstructed a map of this part of the earth through the so-called era, the rocks of which contain the earliest records of living things.

The creatures of the shallow sea were trilobites, somewhat similar in appearance but not directly related to crabs, and brachiopods, shelled mollusks nearly all forms of which are extinct. They were fairly high forms of animal life, the end product of what must have been a long evolution, nearly all trace of which is lost.

A hypothetical shore line of the old sea was found by Dr. Resser in the Green River Lakes region on the west side of the Wind River Mountains in Wyoming. An isolated region far from the haunts of men, an aura of antiquity hangs over it. In the granite rocks through which flow the swift headwaters of the Green River, one of the chief tributaries of the Colorado, Dr. Resser found the Cambrian system represented by between 850 and 1,000 feet of rock in which there were splendidly preserved trilobite and brachiopod Cambrian fossils. When the creatures perished generation after generation, they became embedded in the sea bottom. Sediment, slowly washing from the low shores, sank to the bottom and covered them. This was repeated millenium after millenium and finally, in the course of earth upheavals through millions of years, the sea bottom ooze became rock.

Ordinarily, Dr. Resser says, Cambrian deposits are many times as thick, because of the enormous stretch of time covered by the era, during all of which slow sedimentation was in progress. Their thinness here is evidence that the region must have been very close to the eastern shore.

At no place, he says, was the Cambrian sea very deep. This is shown by the fact that trilobite and brachiopod sheels are found badly broken up by the action of the waves sweeping along the bottom and churning the sediments. Also presumably it was a very clear sea. In the water grew primitive forms of plant life, somewhat similar to the kelp of today. There were also algae which secreted lime to form large beds in some places.

Dr. Resser visited other areas of this ancient ocean in the Grand Canyon, the Wasatch Mountain Range of Utah, and the Black Hills country where some of the rich gold, silver, and lead deposits are in rocks formed during this period.

These regions represent the middle milleniums of the Cambrian. Later the sea spread eastward over the present Rockies and Great Plains as far as Wisconsin and Missouri. In Wisconsin Dr. Resser explored the most complete records yet

found of the closing days of the era, when its peculiar forms of life were reaching the end of their days of dominance on earth.

At that time, he points out, there were granite hills in the country now covered by the Rockies. None of them were very high. Their tops emerged as barren islands out of the placid water. So far as known there was no life on land at that time. Even the first land plants had yet to make their appearance.

Simultaneously with this long, narrow western sea, Dr. Resser says, the fossils records show that a similar arm of the Arctic extended southward in a shallow trough now filled by the Appalachian chain from Labrador to Georgia and Alabama. From time to time the waters withdrew and then came again. Between the two seas there was a wide stretch of barren land possibly extending from approximately western Pennsylvania to a little beyond the Mississippi.

Everywhere, he says, Cambrian fossils are scarce, and the story of the ancient time must be reconstructed from slender clues. But all evidence, he explains, points to the conclusion that it was a very slow-moving, peaceful time with a deadly monotony over all the earth. During most of the period, it seems there was a fairly equable climate and in its shallow seas were developing, without leaving many records, the ancestral forms of the higher forms of life that in succeeding milleniums were to emerge from the water to populate the land.

- Smithsonian Institution.

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CORVALLIS OPEN HOUSE

The Open House of the Geology Department at Oregon State College on Nov.16, 1940, was a great success and well attended by members or the Geological Society of the Oregon Country from Portland.

Upon arriving at the reception held in the Geology Department in the Education Building we signed the register and after drinking some delicious punch we started on a tour of inspection. Dr. Hodge's exhibits consisted of Oregon ores, strategic minerals, critical minerals, common rocks, and microscopes with thin sections as well as various maps and publications. Dr. Packard's exhibit was extensive and one of the most interesting fossils was the skull of the moder mochelys oregonensis - turtle. It was enormous and were were informed that the turtle must have been about fourteen feet in length. Dr. Packard also showed models of different sea plants and animals which gave us an idea of the inside workings. Dr. Allison has been doing research on Fossil Lake and his exhibits dealt primarily with this - especially with the Fort Rock area. Especially interesting were the aerial photographs which are used for geological interpretations. Dr. Allison said that after a little study and the use of a hand lens that even some of the test pits his crew dug last summer could be located. This method covers a greater territory than can be done on the ground itself. This exhibit also included a large number of fossils obtained in the region of Fossil Lake and included birds, fish, small mammals an d snails.

The reception, banquet, lecture, and field trip were all under the guardianship of the fraternity Sigma Gamma Epsilon. This is the honorary geology fraternity and its members are chosen for leadership, scholarship and character.

The banquet in Memorial Union was extremely well attended. A large number of the Portland members of the Geological Society of the Oregon Country were there as well as a good representation of the "small daughter" Salem Chapter in the persons of Mr. and Mrs. Carl Richards and Mr. and Mrs. Franklin Davis and one or two others.

Dr. Hodge was the toastmaster and was, as usual, interesting. There were only a few talks and these were witty and to the point. Dr. Hodge called on Dr. Warren Smith of the University of Oregon, Mr. Groesbeck of the State Board of Higher Education, Dr. Gilfillan of Oregon State College, Mr. Hancock as representative of the Portland group, and William McKinley, president of Sigma Gamma Epsilon who introduced the new intitiates of the fraternity.

After the banquet we went over to the Education building to hear Dr. Allison on the Pleistocene Lakes and Man of South Central Oregon. Dr. Packard in making his introduction of Dr. Allison said that we are all very much interested in tracing back the history of the country in the past. We look to the historian for this. Back of recorded time we go to the archealogists. Still further back the anthropologist takes charge. Then before the coming of man the paleontologist and the geologist take charge. Dr. Condon started the parade in central Oregon. Dr. Cressman works on the lake region of south central Oregon. He is investigating the cultures of the people living in Oregon thousands of years ago; studying early man and tracing the life and environment of this particular region. This is to be part of a large cooperative program set up by Dr. Merriam. The men working on this program are Dr. Cressman, Dr. Howard, Dr. Stock, Dr. Chang, Dr. Allison and Dr. Smith. Southern Oregon is being studied to learn of the coming of man and his animal contemporaries.

Dr. Allison stated the subject given him for the evening was too inclusive and he would restrict himself considerably to the geological aspects. His part in the program was set up because Dr. Cressman found evidences of early man in caves made by waves of lakes. He then went on to show by photographic slides the wave cut benches and other geological aspects of the region. Study is being made of the fossils found, the sand dunes, and other evidences leading to the formation of these caves which are at about four thousand feet elevation. Dr. Allison went into considerable detail in his discussion of the Fossil Lake region. He said that his investigations disclosed that the fossil bearing stratum at Fossil Lake is not more than ten or 12 feet in thickness. Wind erosion has cut through the fossil bed over much of the central part of the lake so that the area is not the inexhaustible source of Pleistocene fossils it was once thought to be. Dr. Allison found that the outlet for this ancient lake was to the north and west.

Sunday there was a field trip under the leadership of William McKinley and the group went to Franklin Butte near Scio. This is a location of leaf fossils and Dr. Sanborn aided in the identification of the leaves found. After viewing various other geological formations in the region the members of the party were entertained on their way home at the home of Franklin Davis in Salem .

- Kate Mahoney.