STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

PORTLAND, OREGON

THE ORE.-BIN

VOL. 8 NO. 6 PORTLAND, OREGON June 1946

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
Head Office: 702 Woodlark Bldg., Portland 5, Oregon

****

RELEASE BRAKES ON MINING INDUSTRY

Much has been written about the excessive depletion of domestic mineral reserves during the war period. Generally the intent of such statements is to give the impression that all of the important metallic mineral deposits in this country have been found, that the large war production used up the greater part of our reserves, and that the life of domestic commercial mineral supplies is limited to a relatively small number of years. Granted that war production seriously depleted metallic mineral reserves, and that known domestic reserves are in a weakened condition for another emergency, the principal causes for this condition are due to Government regulations. Development, the life blood of a mining enterprise, was neglected in favor of production during the war because of manpower shortages. Whether or not certain regulations and their administration were essential in war time is not the point, but rather that when development is neglected, ore is not found to replace that which has been mined. Again if the profit incentive is lacking, new mining enterprises are not undertaken and the finding of new deposits languishes. If development work on known deposits is neglected and if new exploration projects are not undertaken, serious depletion of ore reserves is inevitable. The greatest obstacle to new mining enterprises is oppressive taxation, and a resolution recently adopted by the Mining and Metallurgical Society of America, as given below, clearly points out the unhealthy condition of the mining industry and the remedies that are sorely needed. We cannot change the effects of repressive war regulations, but new life can be given to the mining industry, so essential to progress and protection in this metallic age, by providing incentive, now lacking, to mining enterprise. A far-sighted tax policy would not be an immediate cure-all in this period of high costs, but it would be a long step in the right direction. The resolution follows as given in Engineering and Mining Journal, May 1946 issue.

Ed.

FEDERAL TAXATION OF MINERAL ENTERPRISE

A Resolution of the Mining and Metallurgical Society of America

The members of this Society believe that a dynamic and prosperous mining industry is essential to a sound national economy in the future, is necessary to the national defense and security and is therefore vital to the public interest.

We also believe that a vigorous and flourishing general economy is equally essential to a dynamic and prosperous mining industry.

It is our belief that the existence of a sound and prosperous general economy and mining industry, capable of producing the maximum revenues which the future needs of our government and the servicing and amortization of the national debt require, is dependent upon adequate incentives.

The known ore reserves in the United States have been seriously depleted by the demands of the war effort and prompt action to replace these reserves by new discovery and development is essential in the national interest.

Adequate incentive cannot exist unless the tax system is so constructed as to encourage investment of risk capital in new enterprises, the development of new properties, uses, and processes, and the creation of maximum production and employment.

The Mining and Metallurgical Society of America hereby urges the adoption by Congress at an early date of the following changes in the Federal tax system as necessary to create such incentive and to remove existing clogs upon the expansion and development of mining and other business enterprises:

1. Full and adequate allowance should be made for the tax-free recovery of capital out of profits, including liberal allowances for depreciation and obsolescence reasonably administered. Provision should be made that depreciation rates established and consistently applied by the taxpayer should be accepted except to the extent that the Commissioner establishes that such rates are excessive.

2. Adequate provision should be made for offsetting the losses of bad years against the profits of good years over a reasonably long period. With this end in view, section 122 of the Internal Revenue Code should be revised so as to eliminate certain technical adjustments and limitations it now contains which operate to penalize taxpayers having loss years as compared with those whose profits are distributed more evenly over the given period.

3. The Internal Revenue Code should be amended so as to permit the treatment as current expense, and the deduction of amounts expended in scientific research and experimentation, in the development of new processes and products, and in the exploration and development of new orebodies and ore reserves.

4. In order to stimulate adequate investment of equity capital in hazardous mining enterprises and provide a reasonable opportunity of tax-free recovery of such shareholder capital, provision should be made for the distribution of depletion reserves to stockholders tax-free.

5. The double taxation of corporate profits should be eliminated by provisions which will allow shareholders receiving taxable dividends a reasonable credit on account of corporate taxes paid.

6. The tax upon intercorporate dividends should be repealed, as well as the penalty tax imposed upon corporations filing consolidated returns.

7. The imposition of corporate taxes upon or with respect to undistributed profits of business corporations should be avoided.

8. The tax system should be made more intelligible to the ordinary business man. Its structure should be simplified by the elimination of unnecessary taxes and in all other practical ways. We commend the recent repeal of the excess profits tax and the capital stock and declared-value excess profits taxes from the points of view of removing clogs upon incentive and of simplification of the tax system.

9. An earnest effort should be made to enact as promptly as possible a reasonable, equitable, and well-balanced plan of taxation which can be continued in force for a number of years without the necessity of continually recurring substantive changes. The goal should be a sound and stable tax system.

10. Every effort should be made to improve the quality of administration of the tax laws and thereby to win the confidence of taxpayers that the tax laws will be fairly and equitably administered. The present administrative tendency to disregard legislative intent under the guise of administrative interpretation should be discouraged. Long-established administrative interpretations and

procedures should not be modified or reversed unless such action is compelled by a change in the statute or by authoritative judicial decision. The frequent adoption of inconsistent positions on the same issue in different cases is inimical to public confidence in the fairness of the administration of the revenue laws, and this unfortunate practice should be restricted to an unavoidable minimum.

****

U.S. GEOLOGICAL SURVEY DEVELOPS INSTRUMENT

The U.S. Geological Survey has announced the development and successful testing of a magnetometer instrument that can be used in airplanes for rapid and accurate geophysical surveys of potential iron and petroleum producing areas. Development was through the joint efforts of the Navy Department and the Survey. The instrument is an adaptation of magnetic air borne detector instruments that were developed by the Naval Ordnance Laboratory and the Air Borne Instrument Laboratory of the National Defense Research Council early in the war for spotting deeply submerged enemy submarines operating in the open seas. During the past two years the Survey has employed the instrument in cooperation with the Office of Naval Petroleum Reserves in making test surveys of more than 40,000 square miles of territory from the northern coast of Alaska to the Gulf of Mexico at altitudes from 150 to 14,000 feet. Accurate reference to ground positions is secured in these surveys by electronic and photographic means. It is stated by the Survey that, so far, particular attention has been devoted to surveying potential areas of petroleum and iron ore occurrences but that a wide variety of geologic conditions of scientific importance has been mapped with this instrument. The particular advantage is stated to be the ability to map difficult terrane over either land or water at a speed 100 times as fast as would be possible on the ground and with greater accuracy and detail. Seemingly the instrument is not affected by iron and steel installations or power lines.

The Survey also announces that it has recommended an automatic radio alarm system capable of giving instantaneous warnings over thousands of miles in the Pacific Ocean against approaching tidal waves. This warning system would be made up of observation stations around the shores of the Pacific and on certain mid-Pacific islands. While serving primarily as weather stations, these installations could be so equipped that they would automatically record the arrival of large-amplitude seismic waves near their points of origin, setting off radio alarms that would alert the entire system. By this means adequate warnings could be broadcast to areas subject to possible seismic wave damage.

Studies of the recent disastrous tidal wave by geologists disclose that it was generated by a sudden and sharp adjustment of the earth's crust along a major fault line in the Aleutian trough south of Unimak Island. From this point concentric semicircular shock waves were directed outward into the Pacific Ocean. These waves traveled fanwise through the water at a speed of approximately 470 miles per hour until they spent themselves through distance or were intercepted by shorelines. The shock waves were reported to be scarcely perceptible at the ocean's surface. They sped through the water at 80-mile crest intervals creating surface wave swells not more than 4 or 5 feet in height. The force of the initial shock impetus was sufficiently great, however, that after being transmitted through the water for some 2300 miles within the space of 5 hours' time, the wave forms tripped on the shallow sea floor near the Hawaiian Island coasts and toppled over to create a series of racing super-breakers which by their momentum were able to reach as high as 55 feet above normal high-tide levels in certain exposed areas on the northern coasts. As pointed out by the investigating scientists, the force of the seismic waves was concentrated at certain points along the island shores because of the deflecting or funneling effect of near-shore submarine ridges and wide-mouthed bays. Other areas were spared because of the existence of either steeply sloping ocean bottom near shore or of offshore barrier reefs protecting the land inside.

****

BLOATED VOLCANIC ASH AND TUFF*

NEW LIGHTWEIGHT MATERIAL

or

Is Oklahoma Volcanic Ash Just So Much Dirt?

by

A. L. Burwell

Chemical Engineer, Oklahoma Geological Survey

Is it possible to make something from nothing? The answer will be negative, of course. However, how close to nothing can we start and still make something from it? Apparently, very close. There is an old saying, "cheaper than dirt", meaning that the material in question has a value "next to nothing".

The natural mineral material regarding which this article is written meets these specifications exactly. To the average person seeing the material in place it is just so much dirt. Its value in place is next to nothing. That qualifies the material, volcanic ash, as at least "as cheap as dirt". Starting with a material as low in the economic order as volcanic ash, can something of real substantial value be created? We think it can.

Volcanic ash is the fine dust-like particles thrown from volcanic craters during eruption, and is not the residue of combustible material which is the usual conception of an ash. It may consist of fine particles of solid rock or of finely dispersed particles of molten magma solidified while in contact with the air. Generally it may be considered simply as lava in dust form in contrast to massive-bedded lava, scoria, and pumice. Chemically these substances are more or less alike but are very different physically. On being blown high into the atmosphere during eruption, volcanic ash is often carried great distances by the air currents and finally deposited, sometimes in extensive beds. It may have settled on water and been transported, or after original deposition it may have been again transported by wind or water.

A chemical analysis of a typical and average Oklahoma volcanic ash shows:

	Percent		Percent
SiO_2	72.42	MgO	0.17
R_2O_3	13.47	K_2O	4.84
Al_2O_3	11.55	Na_2O	2.93
Fe_2O_3	1.92	LOI	5.37
CaO	0.64	Loss at 105°C	0.81

Deposits of volcanic ash have been reported from twenty-three counties well distributed throughout the state, with many of the deposits located close to transportation, power, and fuel. The August 1945 issue of The Hopper carried an article on volcanic ash, its occurrences, and analyses of several deposits. In addition, the statement was made that experiments in the laboratory of the Oklahoma Geological Survey show that volcanic ash can be "bloated" under proper temperature control to yield a product somewhat similar to sponge glass. Since that time, as circumstances have permitted, more work has been done on "bloating" so that now it is definitely known that volcanic ash from all the major Oklahoma deposits can be expanded or "bloated" to yield products with a cellular structure, and that tuff, a mineral material of similar origin and composition, reacts in a similar manner.

The basic conditions under which volcanic ash and tuff can be bloated satisfactorily may be summarized as:

1st. A relatively large amount of glass phase must be formed.
2nd. Gas must be liberated within the mass while it is in a thermoplastic condition.
3rd. The glass phase must be sufficiently viscose to maintain the foamy structure.

---

* From The Hopper, May 1946 issue, published in the office of the Oklahoma Geological Survey, Norman, Oklahoma.

These basic conditions are approximately the same as given for bloated clay products by Austin, Nunnes, and Sullivan in A.I.M.M.E. Trans. 148, Industrial Minerals Division.

Experiments have been made to determine the temperature and temperature range at which bloating takes place and the influence of length of time. A report on this work is in process of preparation and will be published as soon as completed.

The question might well be asked as to why the Survey is giving attention to the bloating of volcanic ash. The answer is that occurrences of inorganic material with a true cellular structure are rare. In a true cellular material the cells are separate and not connected one to another. In this respect it differs from a porous material wherein the cells are connected. The difference is the same as that between a mass of soap bubbles (foam) and a sponge or a bed of sand. Because of this difference, cellular material does not allow the passage of liquids or gases whereas the porous material does. Therein lies a further answer as to why the Survey is giving attention to bloating of volcanic ash. In other words, it has industrial possibilities: possibilities as insulating material to prevent transmission of heat, cold, and sound; as light-weight aggregate for concrete construction; and possibilities in numerous other ways.

Bloated volcanic ash looks very much like foam glass. Its apparent density, that is, its weight per unit space, is very low. Products weighing 50 to 35 pounds per cubic foot and even less are possible. Being a mass of glass bubbles it will float on water without absorption. It can be bloated to form, or it can be cut with a saw to shape. It will not transmit heat or sound, and therefore should make ideal insulating material for refrigeration, for furnace construction, for homes and offices, and for many industrial applications. It appears to have sufficient structural strength to withstand reasonable loads, stress and strain.

The present uses for volcanic ash account for only a small tonnage. The consumption as an abrasive is small. The tonnage for concrete admix is erratic and has never been large. But now it appears that volcanic ash may become one of the more important natural mineral materials of Oklahoma. Oklahoma possesses tremendous reserves of volcanic ash and tuff, the processing of which to bloated cellular material will require quantities of fuel. Here again may we re-state the particular advantage of that combination of natural raw material and low-cost fuel with which Oklahoma is favored. Together volcanic ash and fuel may go far. That is the considered opinion of many who have seen the product and visualized the possibilities. If it pans out the Oklahoma Geological Survey will again have had a hand in "making something from near nothing".

****

SALEM ALUMINA PLANT

According to a statement in the Oregon Journal the Reconstruction Finance Corporation has authorized the operators of the Salem alumina-from-clay plant to continue operations for another six months. Senator Guy Cordon made the announcement in Washington D.C. on June 13. The news-release stated that the plant has been and is making aluminum sulphate fertilizer. This probably is a typographical error as the plant in the past has made ammonium sulphate. Mention in the news-release of making aluminum phosphate for supplying U.N.R.R.A. must be a similar error.

The plant at Salem was constructed for the purpose of testing out and developing a process for the commercial production of alumina from Northwest clays, and reportedly about 5 million dollars was spent in construction and tuning up operations at the plant. Seemingly the principal purpose for constructing the plant has been by-passed.

****

PUBLIC DOMAIN

Public domain consists of land belonging to the United States. This land was either ceded to the Federal Government by the original thirteen states or acquired by treaties, purchase, or rights of exploration in the earlier days of the republic. The public land states, or states containing public domain, are listed below:

Alabama
Arizona
Arkansas
California
Colorado
Florida
Idaho
Kansas
Louisiana
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Mexico
North Dakota
Oklahoma
Oregon
South Dakota
Utah
Washington
Wisconsin
Wyoming

Some of these public land states contain only very small areas of public lands. For example, the state of Missouri has now only 432 acres, while the state of Nevada has 45,169,951 acres. As given in a paper entitled, "Vacant Public Lands", issued by the General Land Office, Washington, D.C., Oregon's public lands have a total acreage of 13,273,737. This amount is made up of 12,368,244 acres within grazing districts and 905,493 acres outside of grazing districts. These acreages do not include areas acquired through purchase by the Government for resettlement, submarginal land administration, military, or other purposes. Information concerning vacant public lands may be obtained from the appropriate district Land Office. In Oregon these offices are located at Roseburg, The Dalles, and Lakeview; in Washington there is a district Land Office at Spokane; in Idaho district Land Offices are located at Coeur d'Alene and Blackfoot; in California at Sacramento and Los Angeles; in Nevada at Carson City.

****

METAL MINE CONVENTION

The 1946 Metal Mining Convention and Exposition of the Western Division of the American Mining Congress will be held in Denver, September 9-12. J. B. Haffner, General Manager, Bunker Hill and Sullivan Mining and Concentrating Company, Kellogg, Idaho, has been named National Program Committee Chairman, according to an announcement by Julian D. Conover, Secretary of the American Mining Congress, Washington, D.C. Oregon committee members are as follows: S. H. Williston (Chairman), Vice-President, Horse Heaven Mines, Inc., San Francisco, California; Clayton Jones, President, Sumpter Valley Dredging Company, Portland; F. W. Libbey, Director, State Department of Geology and Mineral Industries, Portland; Irving Rand, Secretary, Oregon Mining Association, Portland; S. R. Smith, President, Bonanza Mines, Inc., San Francisco, California.

****

MISCELLANEOUS PUBLICATIONS

	Price postpaid
The Ore.-Bin: issued monthly by the staff, as medium for news items about the Department, Mines, and minerals. Subscription price per year	$ 0.25
Oregon mineral localities map	0.05
Landforms of Oregon: a physiographic sketch, (17 by 22 inches) 1941	0.10
Index to geologic mapping in Oregon, 1944	Free
Index to topographic mapping in Oregon, 1945	Free

****

The ORE.-BIN
State of Oregon
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
702 Woodlark Bldg., Portland 5, Oregon
POSTMASTER: Return Postage Guaranteed