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DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
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STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
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HAS GOLD LOST USEFULNESS AS A MONEY METAL?

OUR OWN QUIZ PROGRAM

1. Is it true that over a period of years a program designed to belittle gold as a desirable money metal has been and is being carried out in certain quarters, both here and abroad?
2. Have the Axis countries been especially active in such a program?
3. Is it not true that skilful propaganda can mould public opinion so that economic laws and beneficial conditions are subordinated to political considerations?
4. Can a people be forced to accept any kind of money or currency by means of bayonets and the threat of concentration camps?
5. Would some other commodity other than gold have equal or better characteristics as a medium of exchange or backing for currency?
6. Would people have confidence in a theoretical "work unit of value" base for currency (as has been advocated)?
7. Is it not true that people in all parts of the world have an age-old confidence in gold as money?
8. Is it not true that gold possesses the essential qualities of scarcity, beauty, and indestructability required in money?
9. Is it not true that the immemorial instinct of people to treasure gold is even more important in determining its suitability for money than its physical and chemical properties?
10. Have United States forces found it essential to use gold in paying for services in North Africa?
11. Is it not true that gold is now selling at a premium price above \$35 an ounce in various parts of the world - in some places at a high premium?

12. Is it not true that, in Portugal, gold coins command premiums ranging from 150 to 200 percent and in Turkey, premiums up to 400 percent?

13. Is it true that Russia demanded gold from Japan as the consideration in the recent agreement which allows Japan to fish in Russian waters?

14. Is it not true that paper currency, even U. S. paper currency, now sells in various foreign countries at a discount while gold is at a premium?

15. Are governments hoarding gold with the knowledge that if they allow free redemption of gold, the people would demand too much of it?

16. Have governments found a more convenient means other than transfer of gold to settle international balances?

17. Is it true that "barter" was used as the means for paying for goods and services in very ancient times because money had not been invented?

18. Is it true that "barter" is never used by nations in settling balances unless those nations have no gold other than a slim backing for their currency?

19. Is it not true that the pitifully small amount of gold possessed by the Confederacy was the principal cause of its inability to obtain European assistance which fact led to its subsequent defeat?

20. Is it not true that the discovery of gold in California and the large amount produced during the middle of the last century provided a gold reserve which maintained the Union's credit and was a major factor in bringing about victory?

21. Is it not true that the new wealth created in this country by the production of the large amount of gold during the last century was the impelling force behind the beginning of the great industrial expansion in this country?

22. Is confidence in a nation's money policy and economic stability the warp and the woof of the whole fabric of that nation's business?

23. Is it not true that in order to plan his enterprise with assurance a business man must have confidence that the value of the money which is used will not fluctuate?

24. Is the foundation of free enterprise in this country the complete confidence of its people in the value of its money based on gold?

25. Is it not true that the dollar based on gold has become the standard for world trade?

26. With such evidence does it appear that gold has lost any of its attraction as the most secure protection against inflation, poverty, and the government manipulation of currency?

27. Also, does it not follow that the gold miner may look forward confidently to a continuing and increased demand for his product after the war when currency will need to be stabilized, based on gold, in order to insure international commerce?

F.W.L.

STREAK TESTS

A technique for determining "available alumina" qualitatively is described in "Mineral Industries", issue of October, 1942, published by the School of Mineral Industries, Pennsylvania State College. The method is interesting because of its possible application in indicating the presence of various elements and minerals in rocks by relatively simple tests, once the procedure is determined. As stated in the article, which is reproduced below, the method is being studied in order to prove its applicability in testing different minerals.

New Tests for Essential Ores

Aluminum oxide is one of the most abundant constituents of the earth's crust and to the layman, it seems hard to believe that a shortage of this raw material vital for our defense efforts actually exists. The explanation for this apparent contradiction is that most minerals and rocks contain alumina in compounds from which it is difficult and uneconomical to separate the pure aluminum. From an economic point of view, all the mountains of granite or the vast deposits of clays are of little help in solving the problem of aluminum shortage.

Mining alumina ores is based on a different principle than mining the ores of gold, silver, copper, and iron. The value of these ores is nearly always determined by their metal content only. In the case of alumina, however, we are interested not only in the Al_2O_3 content but even more so in the availability of the alumina which the ores contain.

Certain aluminO-silicates like leucite contain the alumina in a form where it can be easily leached out by diluted acids. Others, such as certain clay minerals, require a calcining process after which the alumina becomes available.

Before this war, aluminum production in this country was based on bauxite as a raw material. Today, prospectors are combing the country looking for other minerals containing alumina in an easily available form. This search, however, is extremely difficult. Very little information is available as to which of the minerals do contain the aluminum oxide in a form sufficiently reactive for extraction. On the other hand, minerals of this type are scattered in pockets among other similar minerals which, from the viewpoint of aluminum production, are practically worthless.

The valuable minerals do not possess characteristic properties such as density, cleavage, or color which would make them recognizable. The common "Streak Test", which for many ores has proved a valuable tool, is not significant, for even if the minerals do possess color this is more or less accidental and may be caused by impurities such as limonite or other accessory minerals. The search for suitable minerals, therefore, is seriously hampered at the present time, as only careful chemical analysis can answer the question of the value of a newly discovered deposit, and such analytical work consumes much time and man power.

It has been found that the "Streak Test", by which a streak, or scratch is made with the mineral on a hard unglazed porcelain plate, can be developed into a useful tool for recognizing and distinguishing colorless minerals. The new method consists of a process similar to the development of a photographic plate which contains a picture in a latent form. By immersing the plate in certain chemicals, the part which has been exposed to light becomes visible. A similar method of immersing the porcelain plate, which has on it the invisible streaks of the ore, into various chemicals has been developed. Here, those streaks which contain alumina in reactive or available form assume colors, whereas, other minerals containing the same or even a higher amount of alumina in a less reactive form remain invisible after the chemical has been washed away. The sodium salt of the alizarine sulfonic acid reacts with alumina, making the colorless streak visible. This alumina reagent however, reacts, too, with iron ores

so that only alumina compounds which are relatively free from iron can be detected. The use of a morine solution causes the aluminous streak to assume a light yellow color which emits a green fluorescence when examined under filtered ultraviolet light.

For carrying out the test, well vitrified hexagonal floor tiles have been used as streak plates. Less vitrified ceramic bodies, certain wall tile, for instance, could not be used for it still contains reactive alumina from the decomposition of the clay from which it was made and consequently gives a positive test on its own account. Streak marks are made upon numbered sections of the tile with different minerals. The sample is then immersed, for instance, in the 0.4% solution of morine in alcohol and allowed to soak for two minutes. After the removal from the developer-bath the streak plate is washed with water and the excess of the reagent is removed. In case a reaction has taken place the streak is now clearly visible either in daylight or in the filtered light of an ultra-violet light source.

The method of developing a colorless streak has a wide field of application. Lead ores and zinc ores can be easily recognized and distinguished by a proper choice of chemicals. The magnesium content of a limestone or the distinction between limestone and dolomite offers no difficulty when a solution of Titan-Yellow is used for developing the magnesia. This method, even after the first preliminary experiments, has already indicated its usefulness for prospectors and D. E. Roudabush, a senior student in the curriculum in ceramics is now studying its applicability to different minerals as his senior thesis.

Tourmaline, Rhodonite, and Scheelite Wanted

The Foote Mineral Co., 1609 Summer St., Philadelphia, is in the market for Tourmaline and Rhodonite in carlots, and would buy high-grade scheelite in small lots at a premium if specifications can be met.

Following are the respective specifications:

Tourmaline

| | | | |
|-------------|------------------------------------|---------|-----|
| Silica | (SiO ₂) | Minimum | 35% |
| Alumina | (Al ₂ O ₃) | " | 35% |
| Magnesia | (MgO) | " | 6% |
| Boron oxide | (B ₂ O ₃) | " | 8% |
| Iron oxide | (FeO) | " | 10% |

Rhodonite

| | | | |
|-----------|----------------------|-----------------|------|
| Manganese | (Mn) | (Approximately) | 30% |
| Silica | (SiO ₂) | " | 30% |
| Sulphur | (S) | less than | 0.1% |

Scheelite

| | | | |
|-------------------|--|---------|-----------|
| Tungsten Trioxide | | | 68 to 70% |
| Arsenic | | Maximum | 0.01% |
| Molybdenum | | " | 0.05% |
| Sulphur | | " | 1.00% |
| Phosphorus | | " | 0.10% |
| Copper | | " | 0.01% |
| Tin | | | Trace |
| Antimony | | | Trace |

MAGNESIUM METAL

Production of light metals and light metal alloys is being expanded rapidly but the demand is huge compared to former peacetime markets. Whether or not postwar demand for the light metals will be sufficient to take care of the output geared to war production is problematical, but it seems reasonably sure that postwar needs will be greatly in excess of prewar output. Undoubtedly air transport will be used on a constantly increasing scale; and production of aircraft means production of the light metals, aluminum and magnesium.

Sources of aluminum other than bauxite are now being sought and studied. Unlimited sources of magnesium exist in this country in sea water, in underground brines, in magnesite, brucite, dolomite, and high magnesia silicates. All of these various materials are presently being utilized for the production of metallic magnesium except the last. The reason that the silicate has been relatively neglected is because the separation of magnesia from the silicate on a commercial scale would appear to be the most costly. The high magnesia silicates, however, offer certain advantages since they are known to occur in immense deposits, favorably located as regards transportation and power; and in addition olivine, the principal mineral of peridotite and dunite, contains a higher percentage of magnesium than any common natural material except brucite.

Experimental work on treatment of olivine to produce magnesium chloride has been done at the Minerals Testing Laboratory of the Tennessee Valley Authority, Norris, Tennessee, and at the State Experiment Station, Georgia School of Technology, Atlanta, Georgia. Some of this work is described by E. C. Houston and H. S. Rankin in Mining Technology, July, 1942, published by the American Institute of Mining and Metallurgical Engineers. The principal part of the paper is devoted to a description of the treatment of olivine by hydrochloric acid to produce magnesium chloride of suitable purity for electrolysis. The acid may be made from the chlorine obtained by electrolyzing the chloride. Purification of the leach solution by magnesia or magnesium hydroxide is discussed.

The experimental results indicated that olivine could be converted to magnesium chloride at low cost, but pilot plant work is always required in order to obtain information required to evaluate a process for commercial use. It is understood that considerable pilot plant work has been done since the paper was published.

In southern Douglas County, Oregon, particularly in the Nickel Mountain region, there are great masses of peridotite and serpentine containing between 40 and 45 percent magnesium oxide. This region is penetrated by the Southern Pacific Railroad and is tributary to Bonneville Power, assuming that a sufficient power market could be shown.

The location of a plant for production of magnesium or magnesium salts under postwar conditions would be based on economics, in which geography, power supply, market, and unit cost of production all would be weighed. It is logical to assume that favorably located high magnesia silicates will be given due consideration because of their relatively high magnesia content. The experimental work referred to was undertaken as a study of feasibility of commercial operation under peacetime conditions, rather than for wartime emergency demands.

Oregon Chromite Sand SeparatorNot Custom Plant

Some misapprehension exists concerning the Defense Plant Corporation separator plant which is under construction northwest of Coquille. The plant is designed to treat concentrates produced by the Krome Corporation and the Humphreys Gold Corporation, and will not under present plans of the management at least, accept custom material. Any prospective producer of chromite sand should communicate with the Metals Reserve Co., Washington, D. C. and should not attempt to deliver material to the separator plant near Coquille.

BRITAIN NEEDS SILVER

The following extract from the American Mining Congress Bulletin Service of April 16, 1943, is evidence of the critical need for silver in war industry. It is also a commentary on efforts which have been made to upset the domestic silver purchase program in order to reduce the Government price.

"Lend Lease Silver: A memorandum covering a proposal to lend-lease silver to Great Britain, submitted by E.R. Stettinius, Jr., Lend-Lease Administrator, was viewed with "grave apprehension" this week by Senator Pat McCarran of Nevada. Announcement was made that the Senate Special Silver Committee will call upon the Treasury, Metals Reserve Company, Lend-Lease Administration and other government agencies for "substantial factual data" on the lend-lease proposal and the world silver situation. Particular comment was made concerning the statement in the memorandum that the Metals Reserve Company now has only 2.6 million ounces of silver in its stockpile, whereas very recently the amount was reported to be approximately 10 million ounces.

"The text of the memorandum is as follows:

"1. It is proposed that about $3\frac{1}{4}$ million ounces of free silver from the Treasury stock be lend-leased to Great Britain.

"2. The British have stated that they urgently need a total of 5 million ounces of silver by the first of June. Two million ounces of this silver are needed early in April.

"3. The Treasury has certified that the British request for silver is a reasonable one. One-third of the silver is needed for essential war industry requirements and two-thirds for coinage (domestic and overseas).

"4. Mr. Batt, of the Combined Raw Materials Board, has stated that not more than $1\frac{3}{4}$ million ounces can be obtained from Canada and that the remaining $3\frac{1}{4}$ million ounces must come from the United States or Mexico.

"5. The position of the War Production Board is that the newly-mined silver situation, domestic, and foreign, is too tight to permit the United States or Mexico to furnish $3\frac{1}{4}$ million ounces of such silver to Great Britain. Metals Reserve Company has a stockpile of silver of only 2.6 million ounces.

"6. Treasury free silver not committed to the Defense Plant Corporation for non-consumptive domestic uses is needed by the Treasury for future domestic coinage needs.

"7. According to the War Production Board not all of the billion ounces of Treasury free silver committed to the Defense Plant Corporation is tied up, and sufficient silver is available to meet the British request.

"8. Metals Reserve will make 2 million ounces of silver available from its stockpile of silver within 30 days provided that it is assured that the silver will be replaced from silver subsequently obtained for lend-lease purposes.

"9. The British are willing to agree to return an equivalent number of ounces of silver at the end of the war."

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