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THE FUTURE OF LEAD

by

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In speaking of the future of lead I want to talk about its long time future and not what is "just around the corner." In so doing I am taking the risk of saying many things that are old stories to mining men, but I think these things bear repeating often, and particularly now, lest they be forgotten.

There are some who say that as a nation we are running out of lead and that its future is questionable. I believe that these calamity howlers do a great deal to hurt the lead mining industry. When consumers of lead are told repeatedly that we have lead reserves sufficient to last only 10 or 15 years more, they naturally intensify their search for substitutes. When there is also a temporary shortage and a high price, as there has been recently, consumers naturally give more credence to what the pessimists say than they otherwise would.

But I cannot go along with those who say that we are suffering from a lack of lead reserves. I am therefore deeply concerned

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that, unless we attempt to set the record straight, we will find some of our pet consumers feeding in other pastures when the time comes, as it inevitably will, that lead production exceeds demand.

No doubt you have seen innumerable reports in the last few years on the lead reserves of this country. In general, these purport to show that in ten or fifteen years we will have no more lead in the United States. Sadly enough it is possible to take figures which are sound from an engineering and mathematical viewpoint and prove that, unless you're trying to prove it to someone who knows mining.

Such figures have to be interpreted by mining men, not laymen. Everyone here knows of mines that 15 or 20 years ago were estimated to have only a few more years of life left in them. Today most of these same mines are producing as they were 15 or 20 years ago with still years of life ahead.

For example, in December 31, 1937, three big lead producers in the Northwest reported combined ore reserves of 4,026,000 tons. Between that time and December 31, 1946, in a period of nine years, those same three mines extracted more than 6,000,000 tons of ore. Yet on December 31, 1946, the same three mines reported ore reserves of 3,750,000 tons, or nearly the same figure they reported nine years before.

In other words here is the balance sheet for those three big mines:

Reserves, Dec. 31, 1937	4,026,000 tons
Production, Dec. 31, 1937 to Dec. 31, 1946	<u>6,000,000 tons</u>
Apparent Deficit	- 1,974,000 tons
Reserves, Dec. 31, 1946	<u>3,750,000 tons</u>
Actual Ore found to Dec. 31, 1946 beyond estimated reserves Dec. 31, 1937	5,724,000 tons

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By the exact mathematical reasoning of some of the so-called "experts," those mines should have been exhausted several years ago and by the same reasoning they should have only five more years to go. But I'm sure that no one here would bet on their exhaustion in five years. And these are mines that have been producing continuously for as much as 50 years.

What the "experts" forget is that these mines have vast tonnages of ore that aren't yet in sight. The same thing applies to the nation's total reserves of lead. Who knows but that 15 or 20 years from now the same experts will proclaim that we have but a 10 or 15 year supply of lead, just as they proclaim today.

Other factors not taken into account in such estimates of reserves are changing economic and technologic conditions. If higher prices prevail in the future than at the time estimates are made, naturally the reserves may be greatly increased. Most recently publicized estimates were made several years ago when lead was 6.5¢ per lb. Now it is about 2½ times that figure. Also flotation "stumped the experts" by making commercial ore out of many deposits not previously workable at a profit. Some people may say that recovery is now so high that technologic developments can have little effect in the future. Perhaps recovery cannot be greatly increased but technologic developments may reduce costs to permit profitable recovery from lower grade ores.

Another way in which estimates of reserves for the country as a whole fail to be realistic is that they are averages. The total reserves are estimated and divided either by annual production or consumption to get the number of years left in our lead mines. But production and consumption vary. If we used the pro-

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duction or consumption of the '30's, we'd get much longer life than if we used that of the '20's or '40's. Who can tell accurately at what rate we'll operate over the next 15 or 20 years.

But having done this arithmetic, we merely have an average for the whole country. If each property on the other hand were figured separately, some would show much longer life than others. Thus even if the reserves of some mines were exhausted before the average for the country as a whole, others would last longer than the average and we'd still have some production, even if at a reduced rate. But new developments generally replace the exhausted reserves, so the original estimates go out the window and the whole average is increased. A trip through the lead producing districts of the Northwest to see the new activities there, should be convincing of this.

What it all boils down to is that nobody can sit down and make a study of our lead resources and say that we have just so many years of lead supplies left in this country. There are too many things that such a person can't see. There is undiscovered ore, unknown techniques, unpredictable prices and costs. Just as an example of how ridiculous such attempts are, I recently received a letter from the editor of a popular, large circulation magazine. He said that he was preparing an article on the mineral resources of the United States. Among other things he wanted our estimate of the lead reserves of this country at the time America was discovered.

What would be your answer to that question? There is only one possible answer and that is that our lead reserves were nil at that time. Nobody had found any lead here up to then. But that

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doesn't mean that there wasn't any lead. Millions of tons have been mined since and millions of tons will still be mined. Yet the "experts" would have had to say that we had zero years of lead supply when the country was discovered, instead of the more than 400 years of reserves that we've already proved we had.

So I say that such mathematical estimates of our lead reserves serve no useful purpose, but rather mislead the uninformed to conclude that we are a nation without adequate lead reserves. This leads them to concoct various panaceas toeke out our so-called limited reserves, when a freely operating, unhampered mining industry is the only really effective way to supply the demand for metal. That has been proved in the past by the development of the greatest mining industry in the world through the initiative of American mining men.

Today and for the past few years we have been able to sell every pound of lead that can be produced or imported. We can't expect that situation to last forever. We need go back only a few years to a time when we had to scratch to get rid of even a greatly reduced production. For instance, the available supply of lead from all sources this year in the U. S. should be close to 1,100,000 tons, which should about equal consumption, but just fifteen years ago, in 1932, consumption was only a little more than 400,000 tons. Mine production alone in 1947, or secondary production alone in 1947, could just about have taken care of that, without any help from imports. Yet just three years before 1932, in 1929, consumption was almost 1,000,000 tons. I have here a table showing the consumption in the United States for the years 1920 through 1946. It clearly shows how consumption fluctuates and how rapidly the changes occur.

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LEAD CONSUMPTION IN THE UNITED STATES

(American Bureau of Metal Statistics)

(In Short Tons)

1920	604,800	1934	688,000
1921	520,550	1935	538,900
1922	683,150	1936	633,550
1923	768,000	1937	678,700
1924	812,150	1938	526,000
1925	856,500	1939	667,000
1926	900,900	1940	782,000
1927	840,950	1941	1,049,900
1928	930,600	1942	1,000,000
1929	972,300	1943	1,100,000
1930	768,600	1944	1,090,000
1931	567,700	1945	1,000,000
1932	416,700	1946	925,000
1933	449,500		

Now what is the effect of all this talk about depleted reserves, combined with temporary shortages, on your customers, the consumers of lead.

I say that it is serious. A number of really large lead consumers have asked us to give them the true facts about the situation because they wanted to know whether they could continue to plan on the use of lead in their products. Naturally if a consumer thinks he won't be able to buy lead ten or fifteen years hence, he's going to look for a substitute and if he finds one, he may make the change from lead even though he doesn't have to. In other words, misleading reports of our lead reserves simply serve to spur the search for substitutes, particularly when combined with temporary shortages and high prices.

So when we take a look at the future of lead, we have also to consider consumption. What will the long time trend be?

Already wartime restrictions and high prices have resulted in a drastic cut in the use of lead for foil manufacture which has

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dropped from about 45,000 tons in 1941 to less than 4,000 in 1946. There has been active research to substitute for lead in paints, cable coverings, gasoline, chemical equipment, and elsewhere. What happened in the case of foil is also happening in the case of collapsible tubes.

So I think it is important that manufacturers of such products know that they will be able to continue for many years to get the lead they need. They should realize that recent shortages of lead are temporary in nature and not the result of dwindling reserves, and that current consumption is probably well above normal. They should know that some 30,000 tons of lead, or nearly 10 per cent of domestic mine production last year, was produced from properties that were not producing prior to 1942, most of them not producing until 1944 and that new production will probably compensate for any lost production. They should know that in a few years there will probably be sizable new production from several African properties, from Canada, Australia, and perhaps elsewhere, as well as from Idaho, Montana, California and other parts of the United States.

They should realize that domestic mines are still short some 20 per cent of a full labor supply, that recent shortages may be largely attributable to that and to abnormal demand, and not to depletion. Two thousand additional men could bring production up close to that of the peak war year, 1942. They should realize that development was neglected during the war and that it takes a little time to catch up on that.

On the other hand just as I have said that consumers should realize that in the longer future there should be ample lead to go

around; producers must realize that too. The time will come when supply will meet then equal demand. Those who have lead to sell can never afford to relax efforts to protect markets and to look for new ones. It has been said that the time to prepare for war is in time of peace. When the consuming pipelines that were drained by the war are again filled and the full impact of competition with new materials is felt, consumers must know what the lead can do for them and that the mining industry can supply the lead they'll need. The time to tell them is now, all the time.

Let's just examine quickly a few of the competitive problems lead faces. I've already mentioned foil and collapsible tubes but here are some others:

Plastics for cable sheathing.

Special processes instead of tetraethyl lead to produce high octane gasoline.

Titanium dioxide, zinc oxide and zinc chromate in paint.

Steel, iron, copper, brass and plastics in plumbing.

Rubber, ceramics, glass, stainless steel, monel metal and plastics in chemical equipment.

DDT and other compounds in insecticides.

Roller bearings instead of babitted bearings.

Concrete in x-ray and nuclear protection.

There are others. Some of lead's markets inevitably will be lost. Some new markets, like the sizable tonnages of lead already being used in connection with atomic fission, will naturally develop. But there is the constant battle for markets. Even in the new atomic field there are other materials vying for this market.

So I'd like to end with a few rather general conclusions.

There will soon be enough lead produced in the United States and elsewhere to balance consumers needs and to more than balance them eventually. Our reserves of lead will continue to serve this country for many years to come, no one can say how long. These will be best discovered and developed by a mining industry free of bureaucratic controls and artificial incentives. There will be some changes, already started, in the pattern of lead consumption, some serious loss of markets and some important new applications.

But by and large, I'd like to emphasize that no one will do our work for us. It's up to the lead mining industry to find the lead to meet demands, which are currently above normal, and to supply industry for years to come. And it's up to the lead industry to protect and to develop the markets for its products that will keep the mines busy producing at a profit and that will provide a genuine and not an artificial incentive for exploration and development.