LEAD - WHENCE IT COMES AND WHITHER IT GOES

(A. SUTTIE)

Lead is one of the four most important non-ferrous metals in the world. The other three are Aluminium, Copper and Zinc. All the other 45 non-ferrous metals added together are very small in terms of weight mined and refined compared with any of the big four.

Lead is very important in the UK. We use approximately 300,000 tonnes/year, a similar tonneage to West Germany and Japan, only USA and Russia using more.

Britain has a long history in lead. There were lead mines in Britain in Roman times and lead ingots used to be shipped from here to Rome. You might think that after a lapse of 1500 years that agreement would have phased out but, unfortunately, some people think that those arrangements still have to be honoured.

Where does it come from? All lead originally had to be dug out of the ground, usually as lead sulphide ore. It used to be smelted in small furnaces close to the mines. Visitors to Matlock can visit the Mining Museum at Matlock Bath where there are examples of mining and smelting equipment used from one hundred to two hundred years ago.

One must be careful asking directions to this museum; you should not ask people for instructions how to find the place where there are examples of old, out of date smelting plant!

These days, there is very little lead mining in the UK. The industry is dominated by huge lead mines in the USA, Canada and Australia. Modern plants are two stage. A sinter plant eliminates sulphur, and a blast furnace converts the product to lead. The crude bullion is then refined. Usually there is enough silver to make removal worthwhile. The product is known as primary lead and usually it is exceptionally pure.

Just as the old European processes were outdated there are two problems causing change in the modern US based industry. One is the development of single stage processes like the QSL processes for direct conversion of lead ores to crude bullion. This is being pursued in Germany. The Russians also have an advanced process.

The other new problem is that of treating ores which contain Zinc and Lead together and the only real success is the process known as the I.S.F. blast furnace which is a UK invention, licenced worldwide, and covered by many hundreds of patents.

We in Billiton and BLM are in the position of dealing with secondary or recycled lead. The UK consumption is about 300,000 tonnes per annum of which about 100,000 tonnes goes into batteries. These are recycled through specialist companies like H.J. Enthoven (4 year cycle life). About 50,000 tonnes of secondary lead per annum goes into sheet and pipe. This has a variable life, but it comes back eventually and is recycled by BLM. Other tonneage goes into cables, typemetal, solder and this is all recovered. Sadly, not all the lead can be recovered, because about 25% goes into petrol additives, paint, glass etc.

During the last 20 years the lead industry, like other metal industries, has been made subject to very stringent regulations. These regulations have the effect of ensuring that although you can be harmed by many things like alcohol, tobacco, jogging, at least you won't be harmed by lead. Despite these rules which one might have expected to give lead a poor public image, the world demand for lead has gone up and up for the following reasons:-

1. Batteries: There is nothing better than lead batteries for battery powered vehicles such as milk floats.

2. Lead Sheet: The introduction of cheap substitutes

in the 1950's has been seen to be false economy.

3. Medicine: Use of lead for X ray radiation equipment shielding.

4. Nuclear Power: Lead shielding is essential.

Billiton are serving all these needs. H.J. Enthoven have recently installed a most advanced battery strip manufacturing facility. British Lead Mills have ordered a highly advanced rolling mill having the sort of high technology one normally associates with the steel and aluminium industry. Girdler Brunton and others are serving the needs of the nuclear power and medical equipment industries.