[2009-5-8] Rhenium – The Istanbul Connection

Trying to find a link between Istanbul and Rhenium is a bit tenuous, but visiting Hagia Sophia, the famous Byzantine Christian Church (now a Museum), I almost fell over one.

There, beside the Cathedral, amongst the fallen capitals, was a cylindrical ingot of porphyry stone - approximately 600 mm in diameter and two and half metres or so in length.

Quarried in early times from a single mine in Egypt, porphyry is a deep magenta- coloured rock, harder than granite. To the Romans, its colour was reminiscent of imperial purple which destined it to be a material that would signify power. It was extremely hard to work, and this only added to its rarity and value. The Emperors, having discovered it, then commanded the greatest masons in the Empire to sculpt and make objects from it; and the pillar I was looking at mostly likely harked back to an earlier Church building on the same site. To me at least, I could imagine that for a moment I had touched a place once brushed by Emperor Constantine. As an aside, if you go to the ground floor of Metropolitan Museum in New York, you will see both an imperial bath and a fountain carved from this elusive stone. Inside the Hagia itself, you will see that some of the columns supporting the dome are of porphyry too.

The first Christian Roman Emperor, acclaimed on the death of his father in York in Great Britain, was no Rhenium trader but those familiar with Rhenium will know that it is found most frequently in copper porphyry ores, volcanic minerals older than either the Christian Church or the Roman Empire and which, apart from the name, share almost no connection with the carved granites just mentioned; but it provided me, if nothing else, with an anorak-like satisfaction to make the link between our Minor Metals Trade Association Conference in Istanbul and the element with which I am so closely involved.

Enough of that…. Rhenium agnostics, in fact, may not have been as pleased as I was to note the numbers in attendance occupied with Rhenium – CRI-Criterion and Johnson Matthey with regard to catalysts, HC Starck GmbH, W.C.Heraeus GmbH, Toma OU and AS Nordmet with an interest in recycling, Kazakhmys, KGHM Ecoren, RTZ Kennecott and, new entrant, Ivanhoe, on the mining and recovery side – as well as numerous fellow traders and representatives.

Gathering so many sides of the market together, proved interesting in order to dispel recent myths. JM, despite announcements, still seem to be a number of years away from developing a long term process to recover Rhenium from nickel alloy - security of long term supply of nickel alloy scrap seeming to be the problem.

GE, it was acknowledged, had put out information about reducing their Rhenium demand via 'low-Rhenium bearing engine alloy' for their CFM56 and GE90 engines, in order to decrease their exposure. However, most delegates interpreted the move as a logical step to ration this un-substitutable element, not replace it.

Bob Leary, Manager of Raw Materials and Molybdenum, at Kennecott Utah Copper, meanwhile, confirmed that the new Molybdenum Autoclave Process (MAP) at Bingham Canyon, Utah, USA will be generating 3-5 mt Rhenium by 2012.

Kennecott ceased Rhenium recovery in the 1970s but by this investment has re-connected itself to the main Rhenium grid. The loser, by deduction, is likely to be Molymet, both in Chile and via Sadaci in Belgium, two locations where the Bingham Canyon Rhenium-rich Molybdenum Sulphide concentrates have been travelling for the last three decades. The likely effect on the market will be a 25% efficiency increase in overall Rhenium units recovered from Bingham with a commensurate reduction at Molymet, adding about 1.5 mt in total primary supply. At the same time Kennecott goes

back to its roots, as it was one of the pioneers of Rhenium recovery when employees, Melaven and Bacon, patented the process for the recovery Rhenium from flue dusts in the 1940s. It is a historic moment.

The last few years, when Rhenium prices rocketed upwards reflecting both the metal's rarity and un-substitutability, have not proved an easy ride for some – especially end users who felt entitled to evergreen long term contracts. But the case cannot be made too often that it could have been a lot easier if both producers and consumers had been more transparent about their needs. The secrecy surrounding exact production and consumption levels has turned informed guesswork into an industry and this writer makes no bones about being one of its chief exponents. Without the facts, how can large companies decide whether investing in the Rhenium supply chain is a good idea or not? In fact, without corporate openness in the West, it has been left to certain enlightened Eastern European companies to sink money into processes with greater alacrity than over here; and they are now busy carving a welcome lead in the Rhenium recovery industry from nickel alloy. Either way, the Rhenium market would be in greater deficit today, were it not for their efforts.

As a personal donation to the debate I enclose below a small table with my own figures for Rhenium primary supply in 2009 and beyond.. You might not agree with them – but this time, don't keep it to yourself. Why not ring me and let me know?

Primary Production In metric tons	**2009**	**2010**	**2011**	**2012**
Molymet, Chile	28	25	24	24
Climax, USA	7	7	7	7
Ecoren, Poland	3	6	6	6
Kazakhmys, Kazakhstan	5	2.5 (+ any carry over stocks)	2.5	2.5
Yuzhpolymetall, Kazakhstan	0.50	0.50	0.50	0.50
China	2	3	3	3
Kennecott, USA	-	-	-	3-5
Armenia	0.30	0.30	0.30	0.30
Uzbekistan	0.50	0.50	0.50	0.50
TOTALS	**46.30**	**44.80**	**43.80**	**46.80**

It might be stretching the analogy but Rhenium has one other similarity to Egyptian porphyry – it is extremely hard to work with.