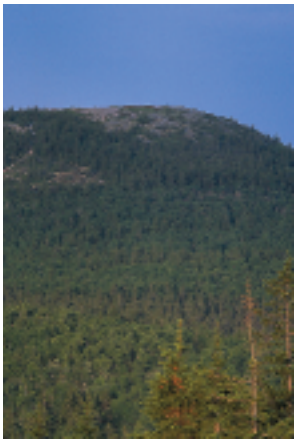
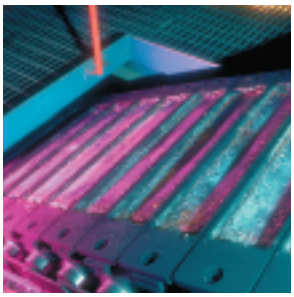
Antimony and Bismuth in New Brunswick





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Antimony and bismuth are a curious couple. Both elements belong to the same chemical family and can be poisonous in the wrong form. Yet both have been manufactured into valuable medicines.

The two metals have played contrasting roles throughout human history. Women from ancient Egypt used antimony for makeup. In the mid-1400s metallurgists found that antimony, lead and tin made the ideal alloy for casting typeface – hence the development of the printing press in 1450. Bismuth, on the other hand, was not recognized until the mid-1700s and received little attention for many decades after that.

Antimony occurs today in such items as flame retardants, glass, paint, bullets and fireworks. Bismuth is a component in special alloys that require a low melting point, such as plugs for automatic sprinkler systems. It is used widely for medical purposes, and also accounts for the pearly shine in some lipsticks.

Antimony and bismuth can exist as pure metal, but tend to combine with sulphur to form the minerals stibnite (antimony ore) and bismuthinite (bismuth ore). In nature, these minerals sometimes occur with other sulphide minerals in massive sulphide deposits.

As New Brunswick By-products

One of the largest massive sulphide mines in the world is found in New Brunswick just southwest of Bathurst. It is owned by Noranda Inc., Brunswick Mining Division. The mine is worked primarily for zinc, lead, silver and copper ore, but also yields small quantities of bismuth and antimony. Since 1969 the company has extracted bismuth and antimony as by-products from its lead smelter located at Belledune, north of Bathurst.

The extraction mechanism involves several steps. Antimony is removed from crude lead bullion as lead-antimony slag during the lead smelting and refining process; it then is converted to a lead-antimony alloy. A lead-bismuth crust is skimmed off the molten lead during the final refining stages, and upgraded to 8% bismuth and 92% lead.

Lake George Antimony

The province hosts the only primary antimony producer in North America. The mine is located southwest of Fredericton at Lake George, where stibnite occurs within quartz veins cutting sedimentary rocks. The antimony sulphide was first discovered in 1863 and there was minor production between 1880 and 1884.

The Lake George mine is owned by APOCAN Inc. Between 1974 and 1990 the Lake George mine shipped antimony concentrates to Great Britain, Belgium, Italy, Japan, Germany and China. It operated briefly in 1996, again shipping concentrates to China. Operations are presently suspended because of unfavourable market conditions.

Interesting Facts

- *Stibium is the Roman word for antimony, which accounts for the metal's chemical symbol of Sb.*
- *A ploughing farmer uncovered the first showing of antimony at Lake George around 1860. The mine opened in 1863 and made Canada's first antimony export shortly afterward.*