

substitution for aluminum would increase if the price were reduced and many more uses would materialize.

The use of magnesium in refractories accounts for about half of the magnesium consumed in the United States; fluxes in the metallurgical industries for 40 percent; and the remaining 10 percent is divided about equally between the chemical industry and primary magnesium metal. Magnesium compounds are the lowest cost, high-temperature refractories available to the metallurgical industry and their use should increase in direct proportion to the production of iron and steel.

A number of opportunities for process improvement need exploration because of the potential benefits that are inferred both regionally and nationally. Among these are the possible commercial employment of Great Salt Lake brines, the development of methods to directly remove magnesium chloride from sea water, and a variety of improvements in current plant techniques.

Methods of reducing corrosion of the metal in finished forms would expand the number and volume of end-use applications.

MANGANESE

Possibly no other single commodity has received as much attention from the standpoint of trying to improve upon the capability to meet a larger share of the United States demand from domestic resources. These efforts have been essentially unsuccessful. Despite extensive low-grade occurrences, all processes and techniques investigated to date fail economically to promise products that compete effectively with the abundant foreign materials that are readily available under normal conditions. It can be expected that, under the pressure of gradually increasing demands and possibly higher prices, process development will continue to invite attention.

By comparison the demand for manganese in the production of steel far exceeds the sum of all other end-use applications. Steelmaking techniques have sought to minimize manganese requirements and it is possible that the quantity presently required could be reduced through new techniques. However, nothing is seen that would eliminate the need or reduce it very substantially.

The low manganese content of nodular substances on the ocean floors has excited interest as a possible future resource (see section on nickel), but the potential is essentially unexplored and no capability to exploit or use the resource is known.

MERCURY

With few exceptions the nature of mercury deposition is such that ultimate resources are difficult to appraise but the world potential is thought to be adequate to meet foreseeable demands. Supply has traditionally responded to sharp and rapid variations in price and it is generally assumed that any need will be met if costs is no object. Domestic sources are seen in the same light except that foreign sources respond more abundantly to price rises and it is likely that imports will continue to provide the major share of United States requirements. The opportunity to improve extraction and processing techniques to some advantage to domestic sources is not attractive. The possibility of discovering new domestic sources that could be commercially exploited at reasonable mercury price levels is not exhausted but is probably remote.

There are few satisfactory substitutes for mercury end uses where its combined high specific gravity, fluidity at normal temperatures, electrical conductivity and other properties find special application. Yet, the displacement of mercury in such applications as the manufacture of caustic soda and chlorine would substantially moderate future demands.

Transportation costs are a serious factor principally in Alaska, where the prospects of discovering significant new domestic resources are most probable.

Throughout the mining and processing of mercury ore, the health hazards due to salivation require the application of constant and careful safeguards.

MICA

Mica describes a variety of types and grades of material with widely different supply-demand relationships. Presently the United States is totally dependent upon imports for its sheet mica requirements, and essentially self-sufficient in flake and scrap. Over the long term suitable substitutes are expected to substantially reduce demands for high quality sheet mica. Towards that end the improvement of techniques for synthesizing mica, reconstituting flake, and ex-