

The rapid development of Western Canadian reserves and the geographical proximity of these reserves to major United States markets have resulted in continuing increases in natural gas imports from Canada. The quality is not of major importance but the reliance of certain regional markets is of concern because of foreign competition and control over future supplies.

Increasing storage capacity near large industrial centers has been largely responsible for a decline in low price "interruptible" gas available during the off-heating season. These storage systems include some that store liquefied natural gas near highly populated urban areas. Shipment of liquefied natural gas by refrigerated tankers is technically feasible and is becoming economic.

NICKEL

The United States is not likely to ever accommodate much of its demand for primary nickel from domestic sources, but there should be no particular problem in gaining requirements for the immediate future from relatively secure and diversified foreign sources at reasonable costs. Yet the apparent vast world resources are real only if substantial technologic advances are realized in the extraction of nickel from low-grade substances and from the lateritic type materials at realistic costs. Even though the majority of such sources are abroad, the advancement of such technology would serve the interests of the United States in assuring adequate future supplies, and the subject deserves immediate attention.

In common with the other alloying elements—particularly tungsten, molybdenum, and vanadium—advances in techniques of interchangeability would tend to minimize instances where spot supply problems might restrict critical production or upset traditional use-patterns.

Reclamation of nickel from secondary sources must receive increased attention, not only as a conservation and economic measure designed to minimize requirements of primary metal, but because of the accumulating detrimental effect nickel presents in the effective reuse of other secondary materials with which it is associated. This detrimental effect is pronounced in the reprocessing of ferrous scrap. The subject deserves substantial and immediate emphasis (see section on iron).

The marine environment promises a new and universal source of nickel which, if exploitable, would minimize the uncertainties that are always present where essential and rapidly expanding requirements are met mostly from foreign sources. Such development, if proven practicable, would introduce a new concept in material supply. Specifically, it would relate supply to technologic capability rather than idigenous mineralogical occurrences. The concept applies to certain other commodities as well. The probability of successfully achieving nickel production from this source soon is low and our present capability is unknown but seen as wholly undeveloped. But achievement of production promises such large dividends that energetic inquiry seems fully justified. Urgency attaches wholly to the complex technology involved and the extremely long lead-time certain to elapse before production from this medium might be practicable even if the inquiry is pursued with vigor.

NITROGEN

The extent to which the compounds of nitrogen might substitute for other substances in critical applications where supply or economic problems might be present, or where new or expanded applications that would materially increase the demand for conventional products—and thus the size of the industry—warrants some attention (the evolution of ammonium nitrate as a practical explosive is an example).

Ammonia is the basic compound from which most nitrogenous materials are manufactured, and it is derived from air and a hydrogen source such as natural gas, refinery gas, naphtha, fuel oil or electrolysis. Hydrogen is the significant economic variable in the manufacturing process. As long as natural gas is abundant and cheap, new ammonia capacity is likely to be established in that vicinity and the world production patterns may tend to shift away from domestic sites. While not a matter of great urgency, the use of domestic coals as a source of cheap hydrogen deserves some attention.

Nitrogen supply is essentially a function of manufacturing capacity and is independent of any important resource limitation. Reduction in production costs has been achieved by effective research and the competitive nature of the indus-