

For many obvious economic and military reasons we cannot afford to count on foreign sources to fill our needs.

In this context, then, it is obvious that very high in the list of our national values must be included the encouragement of a continuing healthy minerals industry. This becomes even more important in the light of the best predictions of national needs in the immediate future.

The most conservative estimates we have seen of the future needs for copper, for instance, indicate that the United States—simply to continue to maintain its present standards—will have to be producing within less than 32 years four times as much newly mined copper as it is producing today.

This tremendous increase may be met, in part at least, by production from such now exotic sources as mining the Continental Shelf, by the use of nuclear energy to glean presently unrecoverable metals from presently unmineable deposits, perhaps even by mining the Moon or Mars.

But the lessons of history demonstrate clearly that the one dependable means of meeting constantly increasing demands is the improvement of technology to allow us to mine today what just yesterday was considered waste rock.

Older mines today are producing from areas which had to be left untouched yesterday, and new developments are opening up deposits of such low grade that they were passed over with scarcely a second glance up to now.

For example, in Arizona today there are two major copper properties under development which will mine rock containing less than seven-tenths of 1 percent copper. Not many years ago, as I am sure you are aware, 6 percent was the cutoff point, the minimum grade that could be mined economically.

At one of these, the Anaconda Company's Twin Buttes property, development costs will run well over \$75 million; at the other, the Duval Corporation's Sierrita property, the development costs will be about \$150 million.

These two properties lie within easy sight of each other, about 3 miles apart. Yet the conditions and problems faced by the two companies are so essentially different they might as well be on different continents.

The Duval ore is easily leachable for the recovery of copper; Anaconda's ore has entirely different characteristics. The Duval body has a significant molybdenum content; Anaconda's has much less. Anaconda is removing some 230 million tons of alluvial overburden to get down to its ore, and from this valley fill it is building earthen dikes behind which to impound its tailings; the Duval ore is overburdened not with alluvium but with hard rock.

Anaconda is making remarkable progress in a very expensive program of planting these dikes with grasses, trees, and shrubs, despite serious problems of soil sterility and so on.

But not even nature has devised means of growing anything but mosses and lichen on hard rock. And not even that in the semiarid desert of Arizona.

I cite this example as prime evidence of the virtual impossibility of writing a workable code to regulate the surface mining operations of these two properties alone and the reclamation of their surface mined areas.