

and the emergence of new substances like titanium and zirconium as common items of industry have greatly complicated supply-demand relationships. Certainly the suite of materials that will be in demand only a few years from now will be quite different than today.

We are aware that change is inevitable. We realize, too, how essential it is that we have leadtime if we are to solve the mineral-supply problems accompanying such change. Yet, we have failed thus far to develop fully effective techniques for recognizing the events that foretell significant changes in demand patterns.

This is the other weakness disclosed by our study.

Our appraisal of demand patterns is really not as good as it should be.

Demand forecasts still flounder in an atmosphere of vague generalities and seldom inspire the needed support for positive and timely action. This support is particularly difficult to generate during periods of prosperity. As humans, we tend to respond only when the house is on fire.

It is imperative that we work continuously to improve our capacity for isolating, appraising, analyzing, and correctly forecasting events that could significantly alter supply-demand patterns. Only in this way will we be in a position to initiate actions that can minimize the impact of change.

Our most critical analysis must be directed to situations where immediate changes in marketing specifications threaten to upset traditional supply-demand relationships. By way of current illustration, the impending changes in end-use patterns of fossil fuels dictated by a general concern with air-pollution problems promise significant changes in marketing patterns. The full impact of marketing constraints that might arise in the future must be clearly understood so as to minimize changes in traditional mineral supply-demand relationships that can threaten both economic stability and national security. And this cannot be accomplished without increased and continuing efforts to improve forecasting techniques and to provide basic planning data.

These first three are the major key items which worry me.

In addition, item 4 is diversifying primary supply patterns.

And in the interest of time, sir, may I just summarize these. They are fully described in the rest of my formal statement.

We are concerned here with being able to be flexible in supply to match the flexibility and demand. This means looking beyond conventional sources to low level concentrations of minerals and marginal and submarginal materials which have to be developed in the future.

Item 5 pertains to creating technology to minimize reliance on conventional resources.

If I could put this in the record too, I could summarize it by saying, the subject includes, for example, the possibility of recovering the minerals from the sea. There is a wide diversity of minerals there. And they are not proprietary to any country. So if we could develop the technology to do this, then our mineral supply problem would be considerably reduced. Or if by the use of nuclear fission, we could find inexpensive ways of treating minerals which are low in value, individual values, but cover a wide range. These, too, are the great hopes for this area.