

**STRATEGIC MINERALS OF INDIA\***

**By Dr. D. N. Wadia, Geological Adviser, Ministry of Natural Resources and Scientific Research.**

Man's progress in civilization from the barbaric stage<sup>1</sup> has been punctuated by his mastery over minerals and metals but Man's civilization has caused enormous depletions on the stock of minerals in the accessible parts of the earth. During the last two wars the exhaustion of minerals and metals used up in munitions and destructive operations has been so great that several minerals and metals have reached almost exhaustion point. The last two wars have caused depletion in resources in petroleum, tin, lead and zinc. The lead, zinc and tin supply is put at only about 17-20 years from the hitherto known sources. This is the picture of modern world with its depleted mineral assets. Let us examine how India stands in the world's strategic minerals map. 23 minerals and metals may be considered most vital in war. Of these, as shown in the annexed table, India has 13 and she lacks in 10.

Strategic Minerals include, besides materials for combat munitions, all mineral raw materials, which are required for industrial sufficiency and preparedness for Defence. Domestic resources in many of these minerals are ample and well distributed. While, however, in respect of strategic minerals India is well supplied—in some of them she has considerable exportable surpluses, in the case of critical minerals (*i.e.*, minerals of essential uses, the supply and procurement of which in adequate amount in the event of any national emergency is uncertain) there are serious gaps and deficiency. In peace time economy this distinction perhaps does not possess much significance, but in the event of war, lack of sufficient reserves of certain mineral raw materials, even though relatively unimportant in themselves, may imply grave hazards to the country's security even in the face of an abundance of "strategic" minerals. Among such critical minerals in short supply in India, the more prominent are : petroleum and petroleum products, sulphur, base metals, *e.g.*, lead, zinc, copper, nickel, tin, mercury and platinum and minerals, *e.g.*, industrial diamonds, graphite, alkalis, potash, cryolite, selenium, etc. India's resources in strategic minerals of world importance are : abundant and rich iron ores, ores of manganese, titanium, thorium and of the light alloy metals, aluminium and magnesium. There is a sufficiency of ores of ferro-alloy metals, chromium, vanadium, tungsten and flux minerals, refractories, abrasives, bauxite, the industrial clays, while in its resources of mica, manganese ilmenite, monazite and beryl, essential for a wide variety of strategic uses, India occupies a commanding, if not, a control position. This state of disequilibrium in the country's mineral economy may not be harmful in time of international peace, but is a source of double danger to national security in a war emergency, when imports of essential commodities, *e.g.*, petroleum may be jeopardised and the off-take of credit earning exports may be stopped. A healthy economy can be achieved by balancing as near as possible, the surpluses against deficits through building up civilian industrial power of production of substitutes for some deficient and sub-marginal commodities and stockpiling of others.

---

\* Based on an address delivered by Dr. D. N. Wadia, on April 23, 1952 at the Second Defence Science Conference.

The suggested remedies are :—

1. Building up a strong peace-time industry.
2. Off-set surpluses against deficiencies by exchange or barter.
3. Stockpile of about 13 essential minerals and raw materials.
4. Substitutes and synthetics ; conversion of local industry to such use.

### **MINERAL AND METALS MOST VITAL IN WAR**

- |                |               |
|----------------|---------------|
| 1. Aluminium   | 13. Nickel    |
| 2. Antimony    | 14. Petroleum |
| 3. Coal        | 15. Platinum  |
| 4. Chromium    | 16. Potash    |
| 5. Columbium   | 17. Sulphur   |
| 6. Copper      | 18. Tantalum  |
| 7. Iron        | 19. Tin       |
| 8. Lead        | 20. Tungsten  |
| 9. Manganese   | 21. Uranium   |
| 10. Mercury    | 22. Vanadium  |
| 11. Molybdenum | 23. Zinc.     |
| 12. Mica.      |               |

### **DEFICIT STRATEGIC MINERALS OF INDIA**

- |              |                    |
|--------------|--------------------|
| 1. Sulphur   | 6. Lead            |
| 2. Petroleum | 7. Zinc            |
| 3. Mercury   | 8. Platinum        |
| 4. Nickel    | 9. Graphite        |
| 5. Tin       | 10. Ferro-tungsten |