HETEROGENEITY OF THE EPPAWALA PHOSPHORITE DEPOSIT CHARACTERIZED BY MINERALOGICAL, SOLUBILITY, AND P_2O_5 VARIATIONS

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In the light of recognition of the Eppawala Phosphate Deposit as a terrestrial phosphorite, primary apatite crystals were identified in hardened or loose matrices formed of secondary phosphate minerals.

Further field and laboratory studies were undertaken during the year under review. Observations on core samples available at the Geological Survey Department in Colombo indicated an irregular distribution of the lateritic and leached zones. Field studies, while confirming such observations, have led to the identification of lateritic and leached entities showing variable textures, compositions, and colours in cross sections of the newly excavated parts of the deposit. In such cross profiles across the hills underlain by the phosphorite, lateritic zones were noted on the lowermost valley-side slopes, whereas leached zones were evident at the topmost portions and in the cores.

The lateritic zones were characterized by reddish-brown lateritic soils or dark humic soils, where primary apatite crystals of varying sizes are loosely disseminated or rarely present in the matrices poor in secondary apatite. The leached zones showed large primary apatite crystals with maximum lengths extending at times to more than 50 cm in the hardened matrices formed largely of secondary apatite. At other points in leached zones small primary apatite crystals of the order of a few millimeters were disseminated in yellowish, loose, soil-rich materials. It was found that the water and citric acid solubilities and P_2O_5 contents increased in different compostional zones in the following order: reddish-brown and black soils, yellowish soils, and primary apatite crystals. Mineralogical variations were also observed in the different zones. The preliminary observations on the mineralogical, solubility, and P_2O_5 variations in the deposit suggest the importance of selective mining at Eppawala.

During the latter part of the year under review, efforts were made to produce soluble fertilizers out of phosphatic samples from different compositional zones using the patented method of Tennakone *et al.* Arrangements have also been made to produce and test the soluble fertilizers with the State Mining and Mineral Development Corporation and the State Agriculture Department of Sri Lanka.