

seem to the observer to be a silvery white and lustrous object, quite unlike a polished sphere which only exhibits the reflected images of external objects. The impression that the pearl is a lustrous object would be further enhanced by the diffuse light emerging from the shadowed areas on which no light is directly incident. The brilliance of the periphery would further enhance the general effect by enabling the entire pearl to be clearly seen.

We may sum up the situation by the statement that the coloured reflection of light by the stratifications of the nacre is not by itself

an adequate explanation of the beauty of the pearl; the special properties of the material which manifest themselves in the chromatic diffusion halo and in the propagation of light parallel to the stratifications play the leading role in making the pearl appear a lustrous and attractive object.

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1. Raman, C. V. and Krishnamurti, D., *Proc. Ind. Acad. Sci.*, 1954, 39A, 215.
2. —, *Ibid.*, 1954, 39A, 1.

RADIO-THULIUM TO REPLACE X-RAYS

DEVELOPMENT of a portable X-ray unit using radioactive thulium in place of electricity was announced recently by the Argonne National Laboratory of the United States Atomic Energy Commission. Weighing less than 10 lb, the unit produces rays comparable to a 100,000-volt X-ray machine without the need of a power source. Its light weight makes it possible for a doctor to carry it to isolated areas where electricity is not available and to take X-rays of persons who cannot be moved.

The active component of the instrument is a tiny particle of thulium which has been made radioactive in the heavy water nuclear reactor at Argonne. Thulium is an extremely rare material which heretofore has found little practical application.

The instrument does not require an electrical power supply as does conventional X-ray equipment. In addition, it is quite inexpensive. Exclusive of irradiation charges, the total cost of the first model was \$40. The use of thulium as an X-ray source was first suggested by British scientists who have developed a similar but less powerful instrument. Excellent rare earth separation facilities and powerful reactors in the U.S.A. permitted development of the Argonne instrument, which contains a thulium source several hundred times more powerful than the British units. Industrially also, it has potential use as a density determination device. It may find considerable use in the determination of levels and densities of liquids in closed systems.

REORGANISATION SCHEME OF THE BOTANICAL SURVEY OF INDIA

THE main features of the reorganisation scheme are as follows: (1) The division of India into a number of regional circles based on phyto-geographic affinities, each under a Regional Botanist with his headquarters at Dehra Dun or Lucknow, Madras, Calcutta and Poona respectively; (2) Establishment of a Central Directorate under the Chief Botanist, for co-ordinating the activities of the various Regional Circles; (3) The creation of a Central Botanical Laboratory under a Director at a suitable place in India, where the living plant will be studied in relation to its botany and its

utility to the nation; (4) The maintenance of a Central National Herbarium which will house the "type specimens" and a fully representative collection of the plants comprising the Flora of India; and (5) Maintenance of a Botanical Museum on modern lines at Calcutta.

Collaboration with Universities and Research Institutions will be encouraged by the granting of stipends to staff and research students to conduct research on problems dealing with the Flora of India, and for collecting material for the long overdue revision of Hooker's "Flora of India".