

greater extent than the parent stem. So far this has not proved to be the case with the rare earths found with thorium and zirconium, although tons of these by-products have accumulated.* They await the discovery of a commercial demand. The prices at which these rare materials are quoted in chemical catalogues and trade journals are purely provisional and the values are fictitious, and need not deter one inclined to exercise his ingenuity along these lines. When the demand is created, it will be met as in the case of thorium. That many have already busied themselves with the problem appears from what has been said. But so far little has really been accomplished with these by-products. The real object of my lecture has been to call attention to this. If I may have stimulated some one to take up the problem and cause him to secure results, I shall feel my work as a teacher has been well done. The teacher may not be the torch bearer, but he may kindle the torch of him who holds it aloft that the world may see.

* It takes about 100 g. of the purified monazite sand to yield enough thorium for an average mantle. About 40 million mantles was the output of the United States manufacturers last year. This required 4000 tons of monazite. The by-product amount is about 35 per cent.