

munition factories the time taken on a given process varied from 4 to 15 and from 3 to 10, the differences being due to degrees of bad management. By the collaboration which the Ministry secured, conditions more uniform were obtained, and waste was eliminated by the Government experts giving the private managers the benefit of their advice. In the manufacture of sulphuric acid, for instance, it was found that the proportion of unnecessary ash created was much in excess of what it ought to have been. Metal scrap—tin, steel, iron, and brass—often represents up to 50 per cent. of the material actually used. The Army Salvage Department and the Ministry of Munitions Scrap Department effected "immense savings" by turning over mountains of refuse to be treated in special factories which private enterprise would not have had any motive to set up.

As Dr. Addison shows, it was necessary to set up State factories, not merely to augment the supply of shells and explosives, but to show how much more cheaply the work could be done by Government servants than by private-enterprise patriots. After allowing handsome profits, it was found that using the experience of the State factories as a basis of costing, prices could be, and were, reduced by two-thirds. The private-enterprise patriots required 23s. for an 18-pounder shell; but the national factories at Dundee, Keighley, and elsewhere could produce them for 9s. The metal discs for which the armament firms charged 10d. were made by the national factories at  $4\frac{1}{2}$ d., and tubes for which the private price was 1/6 were made by servants of the Ministry of Munitions for  $4\frac{1}{8}$ d.

#### **A State Departure.**

Not only so. The Ministry made explosives that had not till then been made in this country on any scale at all. The acid, oleum, had to be got from America at £12 a-ton. But the Ministry set up a factory at a cost of £750,000, and by May 1916 it was found that the cost of erection had been saved, with £225,000 of a surplus, the gross saving being £975,050. For the oleum which cost £12 a-ton to buy from America could be manufactured by State employees at 55s., allowing for all reasonable overhead charges, and