## PREFACE.

In the course of its investigations conducted for the increase of efficiency in the mineral industries the Bureau of Mines has given especial attention to the prevention of wastes in the production and utilization of petroleum. It has long been realized by the most intelligent and far-sighted producers that the insidious unseen wastes are far more serious than the visible wastes and that preventive measures must be taken if our petroleum resources are not to be prematurely depleted.

The losses, or wastes, incident to the petroleum industry may be broadly divided into two classes, as follows: (1) Losses incident to production and (2) losses through inefficient utilization.

Among the noteworthy wastes falling within the first class may be mentioned the unrecoverable oil, estimated to be more than 50 per cent of the oil in the sand. In addition there are the invisible wastes due to the inefficient protection of oil and gas bearing strata against infiltrating waters.

Losses in utilization include not only the actual waste in the use of petroleum and its products, but the making of excessive amounts of less desirable products in manufacturing the products that are in most demand. For instance, gasoline is obtained chiefly from petroleums containing a large proportion of paraffin hydrocarbons, but many of these petroleums yield only small percentages of gasoline under the old distillation methods, so that their utilization in this way has been uneconomical and wasteful. By "cracking" processes the yield of gasoline has been largely increased, but the yield should be still larger. It is estimated that the output of gasoline by the Burton process, the cracking process used by the Standard Oil companies, amounted in 1915 to 3,000,000 barrels, but this was equivalent to 18,000,000 barrels of Mid-Continent crude oil. In other words, only about one-sixth of the bulk of an average paraffin-base petroleum from the Mid-Continent field was converted into gasoline by the most efficient cracking process in commercial use in 1915.

Some striking facts regarding present conditions in the petroleum industry with especial reference to the increased consumption and existing high price of gasoline are given in a report made by the Secretary of the Interior to the United States Senate under date of February 2, 1916, and published as Senate Document No. 310.