

lightest fraction following the separation of benzine. 1.5 per cent of the total oils is represented by "yellow oil", employed as fuel in Diesel engines. More than 50 per cent is gas oil used for the production of oil gas, in the manufacture of grease, as fuel of Diesel engines, fuel oil in furnaces, as a lubricating agent, and as an admixture of asphalt. The various lubricating oils obtained from petroleum, shale oils, and lignite oils are further processed depending upon their physical-chemical properties and upon the purpose for which they are intended. They are, thus, converted into spindle oils, cylinder oils, light and heavy machine oils, motor oils, and transformer oils.

*Coal Tar Oils.* Coal tar oils are obtained by the distillation of tar, distilling over at a temperature from 150°C to 400°C, and represent approximately 65 per cent of the tar. They are composed of paraffins, naphthenes, and olefins with minor admixtures of methylated naphthalenes, anthracenes, phenols, and creosotes, i.e., substances which are present in crude, but not in purified naphtha oils.

*Paraffins.* Paraffin is manufactured from the distillation residue of certain mineral oils (Galician and American), from the heavy oil fraction of crude shale oils, and from the paraffinic fractions of lignite. The technical procedures used are fundamentally alike regardless of the nature of the raw material. The distillates containing the hot wax are piped from the stills into the paraffin or cooling sheds, as the extraction plants are called. They are allowed to cool and settle thoroughly before they are pumped into the refrigerators, where they are chilled until they form a solid mass. This frozen material, containing the crystalline paraffin mixed with oily constituents, is scraped off the refrigeration coils with knife-like tools and is transported by a worm screw conveyer into filter-presses. The heavy oil is expressed, leaving a residue of crude paraffin, known as sludge, upon the canvas filters covering the plates of the hydraulic presses. In old type presses workers shovelled the scale upon canvas cloths, which were laid in layers on bogies, the ends and sides of the cloths being folded over, and the pile was placed under the press. The slack wax remaining in the press is scraped off the filter cloths with spade-like tools, and then subjected to refining and purification procedures, to remove coloring matter and small amounts of oil still adhering to the paraffin crystals.

In an older and now generally discontinued method, the paraffin was dissolved in benzine. This solution was chilled and sent through a filter press. After repeating this procedure several times, the traces of benzine remaining in the paraffin were removed by passing overheated steam under vacuum into the purified paraffin, driving the benzine out. The woollen cloths used in the presses were cleaned by hand. In more recent times, the separation of the paraffin from the benzine is accomplished in high-speed centrifuges of the Sharples' type. This process has been replaced in modern plants by the "sweating process". The paraffin scale is removed from the filter cloths by instruments