

...PETROLEUM...

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ACCORDING to the Colonial Museum and Laboratory reports, petroleum exists at many places in New Zealand, and a very interesting paper on the mineral oils of New Zealand is to be found in the transactions of the New Zealand Institute of 1873. Taranaki oil was at that time examined by the late Mr. Skey, who found it to be remarkable for its high specific gravity and freedom from unpleasant odour. Two companies were formed in 1865 to work the Taranaki mineral oil fields, and one of these obtained, by pumping, about fifty gallons of oil weekly, the oil being mixed with a good deal of water.

From time to time fresh efforts have been made to cope with the water; the latest reports indicate that the difficulty has been overcome, and that there is much oil to be had for the pumping. The question whether the quantity and quality of the oil, and the working expenses of refining, will allow the material to compete with the imported

ance of mineral oil, caused the product of springs in Southern Russia to be systematically collected, and in 1819 a tax appears to have been paid in Baku upon an output of 4,000 tons annually, and by 1880 the output increased to 160,000 tons. It was not until 1854 that the first American company, the Pennsylvania Rock Oil Co., was formed; this company met with little success in its early attempts, but in 1861 the first flowing well was tapped, yielding 300 barrels daily for six months; from that time the development of the Pennsylvania trade has been enormous. In 1893 the output had indeed reached the extraordinary amount of 30,000,000 barrels per year. Mineral oil has been found in larger or smaller quantities in nearly every civilised country, but it is only the Russian, American, and Burmese fields which practically affect the market at the present day. The output of the different wells in a petroleum district varies greatly. From some wells the oil must be pumped, from others it rises in a natural fountain, sometimes with uncontrollable violence. One of the best-known instances is that of the Droobba well, which, after being tapped, was uncontrollable for 115 days. It threw up an oil column varying from 100 to 300 ft. in height, and the probable loss of oil was at least 100,000,000 gallons. The whole district was drenched with oil and sand which partially buried the houses in the neighbourhood. Then a cap was affixed to the well mouth, and it continued to yield 3,400 tons daily for the next six weeks.

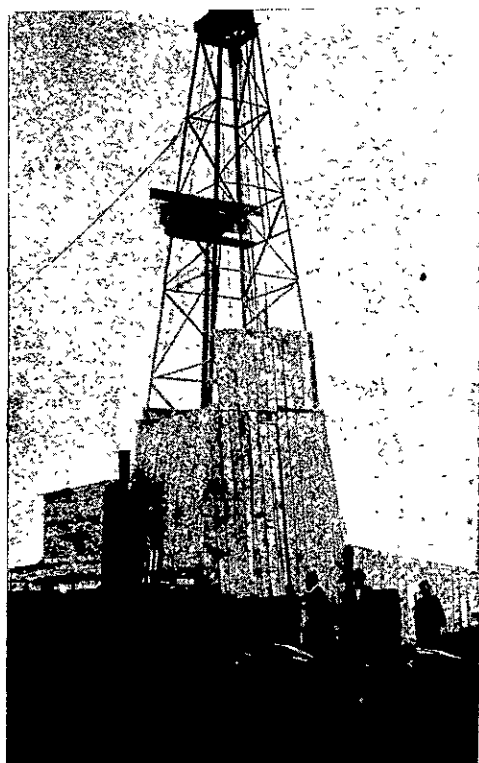
The nature of the crude oil differs largely in different countries and even in neighbouring localities; sometimes it is thin, volatile, and without unpleasant odour, in other cases it may be thick, semi-solid, nearly black in colour, and may have a highly repulsive smell; this is particularly the case if sulphur is present, as for instance in many of the Canadian wells. What the origin of mineral oil is we do not know. It has been ascribed to the action of heat upon fossilised animal or vegetable matter, or to the action of water upon metallic carbides. It is interesting in this connection to note that the characteristic hydro-carbons present in American petroleum are almost entirely different from those in Russian oil, indicating possibly a complete difference in mode of origin.

The method of refining the crude oil is simple. It is distilled from enormous retorts, the more volatile portions naturally distilling first. These are commonly classed as benzene, which may be further fractionated into products with such fanciful names as rigoline, benzoline, or petroleum ether. After the benzene is distilled a heavier product known as kerosene comes over. This is the product which boils at 150 to 280 or 300 degrees centigrade. In its crude state it is yellow, has a highly-fluorescent appearance, and, not uncommonly, a vile smell. To make the oil fit for burning it is agitated with sulphuric acid, which destroys those substances which make the oil clog the wick, then it is shaken with caustic soda to remove all acid compounds, washed with water, and sometimes redistilled. Even now it may be necessary to bleach the oil either by means of exposure to sunlight or by a system of charcoal filters.

At a higher temperature than the boiling point of kerosene heavy oils of darker colour distil. When these are cooled, paraffin scale crystallises and the oil filtered from the scale is chiefly used

as a lubricant. If it be distilled it can be separated into light lubricating, heavy lubricating oil, and vaseline. Some of the oils yield little vaseline, and others but little paraffin scale.

The testing of the final products is a matter of importance both to the manufacturer and the purchaser, and when contracts are closed it is usual to specify colour, smell, flashpoint, distillation test, and burning quality in the case of kerosene, and further to specify viscosity and behaviour in the cold on the part of lubricating oils, whilst for the paraffin scale, which, after refinement, is called paraffin wax, the smell, colour and melting point require rigid attention. The apparatus used for the determination of the flashpoint is a most ingenious instrument. In this apparatus the oil is slowly warmed until it gives off vapour in sufficient quantity to catch fire or flash when a flame is brought to a fixed distance from the surface of the oil. The most commonly used instrument is that devised by Sir Frederick Abel, and is of such a nature that all personal equations due to the idiosyncrasies of the manipulator are carefully excluded—a most important point when we remem-



TARANAKI OIL FIELD: THE BORE.

article cannot yet be determined. Attempts have also been made to work the oil in Poverty bay and the Warapu river. The oil from these districts is of lower density than that from Taranaki, and is said to yield a better class of burning oil.

The occurrence of mineral oil appears to have been well known to the oldest writers, references being common amongst the writings of Herodotus, Pliny and Plutarch. In the travels of Marco Polo a fairly lengthy description is given of the oil springs in the Baku district, which, indeed, appears to have been the first centre of the mineral oil industry. Peter the Great, recognising the import-



TARANAKI OIL FIELD: THE STREAM OF PETROLEUM THAT RECENTLY LED TO A MILD BOOM.

ber that it is to the advantage of the seller to register the flashpoint as high as possible.

Our illustrations of the Los Angeles oil fields convey an excellent impression of the extent of the great industry in California.

A couple of three-storied buildings, now in course of erection in High street, Christchurch, will, when completed, greatly improve the appearance of that part of the city. Architects, Clarkson & Ballantyne, and England Bros; contractors, Rennie & Pearce.



CALIFORNIAN OIL FIELDS STORAGE TANKS, AT LOS ANGELES.

[Photo lent by Mr. James Gilbert, Wellington.