LXXXV.— *On an Apparently New Hydrocarbon from Distilled Japanese Petroleum.*

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A VISIT that we made to the petroleum wells at Sagara in the prefecture of Shizuoka, Japan, last year, led to our attention being drawn to a solid yellow substance which occurs in the very last portions of the distillate from the petroleum. These portions constitute an almost solid brown grease with green fluorescence. When treated with light petroleum oil, this grease leaves a yellow bulky friable mass of a dull greenish shade, from which a bright yellow

pulverulent substance may be obtained. Like other similar products, however, the yellow substance can be separated into a white one and a very small quantity of a yellow one not yet examined. The white or yellow substance is a hydrocarbon, distinct apparently from any yet described.

The purified hydrocarbon is amorphous in appearance, but when deposited from a benzene solution forms minute crystals. From acetic acid, it is more distinctly crystalline, and on drying is of a whiter colour and silky lustre. It is denser than carbon bisulphide, highly electric when dry, and when prepared in the way adopted, has a bright yellow colour. This colour, however, as mentioned above, is due to a matter adhering in minute quantity to the main product; the latter may be deprived of colour, more or less completely, by cooling its hot solution in benzene or acetic acid after it has been exposed for some time to the sun. The yellow colouring matter in solution is thereby changed, but only slowly, into an orange-red and still soluble matter, and in this respect differs from the chrysogen of coal-tar which is bleached by the sun.

Both the yellow and the white modification of the hydrocarbon can be sublimed almost unchanged in a vacuum, but with difficulty. When heated in the air, it darkens and is partly decomposed, apparently by oxidation. Its melting point is accordingly not sharply defined, and lies between 280° and 285° .

There is no good solvent for the hydrocarbon. Boiling heavy benzene dissolves about 2 per cent., and carbon bisulphide, ether, chloroform, glacial acetic acid, light petroleum, and alcohol also dissolve more or less.

When a cold ethereal solution of the yellow form of the hydrocarbon is poured on to a filter-paper, the edges and upper part of the filter soon throw out, in consequence of the evaporation of the ether, a crystalline arborescence, several millimetres high, which is of a pure white colour. Shortly after its formation, the spicules of this arborescence suddenly shrink up, one by one, and resume the original bright yellow colour. This series of phenomena is very striking.

Cold sulphuric acid gradually changes it to a bright brown flocculent substance, probably a quinone. Moderately heated, it dissolves in the acid to a fine deep chromium-green coloured liquid, which becomes indigo-blue when more strongly heated. Poured into water, neither the green nor the blue solution deposits any insoluble matter.

In hot glacial acetic acid, chromium trioxide readily forms a flocculent orange-red quinone, readily converted to a colourless soluble substance by the further action of the chromium trioxide. The quinone is brown when dried, and is but little soluble in benzene, chloroform, or alcohol.

Nitric acid acts slightly on the hydrocarbon, converting it apparently to its quinone, or to a nitroquinone, very little soluble in the acid.

Picric acid forms a reddish-brown, slightly crystalline compound with the hydrocarbon, which is decomposed by washing with alcohol or with water.

Bromine acts moderately on the hydrocarbon, evolving hydrobromic acid and yielding a bromine-derivative of the hydrocarbon, soluble both in chloroform and benzene. It is a brown substance, not yet obtained in the crystalline state.

Both yellow and white forms of the hydrocarbon have been burnt for analysis, with results which correspond to those calculated for $n\text{C}_4\text{H}_8$, where n is perhaps 6:—

	Yellow.			White.		
	I.	II.	III.	IV.	V.	C_4H_8 .
Carbon	94.10	94.08	94.15	94.13	94.10	94.12
Hydrogen . .	5.99	5.98	5.88	6.10	6.08	5.88
						<hr/> 100.00

The hydrocarbon, "petrocene," which Hemilian obtained in 1877 from Pennsylvanian petroleum, is not only like ours in origin, but also in several of its properties. It melts, however, above 300° , is almost insoluble in ether, and the formula assigned to it is $\text{C}_{32}\text{H}_{22}$.*

Prunier and David's hydrocarbons, which in 1877 had been exhibited as petrocene, scarcely need any consideration. One of the hydrocarbons which Sadtler and McCarter examined in 1881 agrees with ours in melting point, but differs in composition, having the formula $\text{C}_{16}\text{H}_{14}$ = carbon 93.2 per cent. Picene somewhat resembles our hydrocarbon, but differs in its melting point (330 — 335°); in being capable of distillation in absence of oxygen; in its distinct crystalline form; its solubility in many solvents being less; solubility of its quinone in chloroform, &c.; and in its crystalline and insoluble bromine-derivative. Benzerythrene, described by Schultz, is somewhat like our hydrocarbon, but melts at 307 — 308° , and is soluble in cold nitric acid. Others are too remote from ours in properties to require consideration.

We hope to be able to extend our examination of this hydrocarbon from Japanese petroleum, and to give a more precise account of its properties than in this preliminary notice.

* $\text{C}_{32}\text{H}_{22}$ has 0.46 more carbon and 0.46 less hydrogen than C_4H_8 .