There were 2,200 cases of acute poliomyelitis discharged, or 0·5 per 10,000 population, 1,000 fewer than in 1958; there has also been a steady rise in hospital discharges for cancer of the lung, from 22,400, 5·0 per 10,000 population, in 1955, to 30,600, 6·7 per 10,000, in 1959. Discharges for other tumours benign and malignant, have remained fairly steady.

Discharges for coronary disease continued to rise. The 1959 figure was 56,600 (12·5 per 10,000 population), 6,800 more than in 1958. For other heart diseases and hypertensive disease, combined, there were 5,500 fewer discharges in 1959 than 1958. 44,600 cases of varicose veins were discharged, 9·8 per 10,000 population, compared with 40,900 and 9·1 in 1958.

Figures for influenza, bronchitis and pneumonia all showed an increase over 1958, but whereas hospital cases of influenza fluctuate (2,600 in 1955 and 1956, 22,200 in 1957, 4,200 in 1958 and 10,000 in 1959), pneumonia and bronchitis have increased steadily from 58,000 and 35,400, respectively, in 1955 to 81,000 and 60,200 in 1959.

In the two years since 1957, discharges for head injuries increased by 20 per cent to 82,300, a rate of 18·1 per 10,000 population, and other injuries by 13 per cent to 219,200 and a rate of 48·3.

The number of maternity discharges in 1959 was 612,400, being 80·2 per 100 births, compared with 599,000 and 75·9 in 1958. Of all births, 60·5 per cent took place in hospital compared with 57·5 in 1958.

ORIGINS OF PETROLEUM

SIR ROBERT ROBINSON has put forward an intriguing new theory suggesting a duplex origin of mineral oils.* The prevailing view is that biologically derived organic matter aged and was transformed into petroleum; but the organic chemistry of this supposed petroleum has never been satisfactorily worked out.

In place of this conception, Sir Robert suggests a duplex mixture which, wherever it was situated, had plenty of time to find its way to the littoral regions of the oceans and there to become admixed with organic life. As in the full biological theory, life would be promoted by salts brought down by the rivers.

It was indicated by Oparin and Urey that the primeval atmosphere was probably largely methane, carbon dioxide and ammonia and the temperatures rather high. The atmosphere of Venus may be similar. It contains much carbon dioxide, and Hoyle has suggested that the clouds could consist of oil. Organic matter has been found in meteorites. Loss of hydrogen from methane would yield hydrocarbons and the thermodynamic equilibrium would be disturbed by escape of hydrogen from the atmosphere. Urey and Miller have shown that simple amino-acids, for example glycine and aspartic acid, can be produced in the laboratory naturally, by irradiation of such a mixture after cooling. Quite recently, Bahadur and Srivastava have made peptide from the same amino-acids by photosynthesis in aqueous solutions. The simple, early non-chlorophyllic organisms might well have used hydrocarbons as a source of energy, and possibly become covered with oil concentrated near the shores. It is hard to see that the distribution of oil which is now observed presents any insuperable obstacle. Almost all geochemical distributions are curiously uneven. The primeval oil may have been on the surface of the seas and brought to shore by solids such as small organisms and rock dust combined with the action of the tides. The release from miscelles, as suggested by Baker, is another possibility.

There are several mechanisms for straight-chain synthesis. Among these the most likely are the Fischer-Tropsch and oxo-synthesis. If olefines were present, or developed from products of oxo-synthesis, they could react with carbene to alkyl*cyclo*-propanes. The latter are known to give straight-chain α-olefines on pyrolysis as there is ample room for isomerization, branch-chain synthesis, aromatization and other cyclization, introduction of nitrogen and sulphur and so on in varied and inevitable side reactions.

* *Catalyst*, 6; Spring, 1961.

NEW AFTERGLOW EMISSION ASSOCIATED WITH METASTABLE NITROGEN ATOMS

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ATOMIC two-body recombination is of importance if the atomic concentration is small enough. This is known to occur in interstellar space, for example. In laboratory experiments three-body recombination is usually the most important. When the gas pressure is small, the atoms diffuse towards the wall where they are de-activated before they recombine by two-body collisions. Addition of an inert gas reduces the diffusion effect. One may then observe strong emissions of atomic lines of forbidden transitions or atomic recombination spectra. These emissions are usually characterized by a strong afterglow since the recombination processes are slow or the life-times for the forbidden transitions very large, of the order of seconds. In the present article a new example is given of atomic recombination involving excited nitrogen atoms.

The discharge tube is a 1-l. glass bulb with two side-tubes sealed in. One contains a 2-mm. diameter tungsten rod which may be used as an internal electrode. The second tube contains phosphorus pentoxide and sodium trinitride powder. Phosphorus pentoxide eliminates the last traces of water vapour; sodium trinitride is used to produce small quantities of pure nitrogen.

In some experiments, in order to improve and accelerate the purification of nitrogen, a portion of the inner surface of the glass bulb has been coated with a thin layer of solid sodium. After careful evacuation, the glass bulb is filled with pure xenon

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