

News and Views

Billingham Hydrogenation Plant

THE formal opening on October 15 by Mr. Ramsay MacDonald of the coal hydrogenation petrol plant of Imperial Chemical Industries, Ltd., at Billingham-on-Tees, marks the start of a completely new British industry. Reference to the present position of commercial hydrogenation of coal has already been made in these columns (NATURE, April 6, 1935, p. 538). The Billingham plant is the first in the world to make petrol on a commercial scale from bituminous coal. It was originally intended to produce 100,000 tons a year of petrol from coal. It was later decided to increase the capacity to 150,000 tons, the extra 50,000 tons to be made either from coal or creosote oil and low-temperature tar. The first section was ready in January, 1935. Creosote oil was used as the starting material, and the first petrol was made in February. The first coal unit was started in June, and the output is expected to reach the designed figure before the end of this year. The normal rate of production is 410 tons or 123,000 gallons of petrol a day. 40,000 tons of petrol have already been made, of which 27,000 tons have been shipped to the oil companies for distribution. The coal consumption is estimated as 4 tons of coal to 1 ton of petrol produced.

THE raw coal is cleaned to less than 2½ per cent of ash and is ground up with oil previously made in the process to make a 50 per cent coal-in-oil 'paste'. This is injected against the working pressure of 250 atmospheres and mixed with hydrogen. The mixture is heated up to reaction temperature, and liquefaction of coal takes place at 450° C. A small heavy oil fraction containing the unconverted coal (5 per cent by weight) and ash is treated for oil recovery, and the coke residue is used as a fuel. The major part of the coal is transformed into lighter oils which are vapourised, and are recovered on cooling the gaseous products leaving the converters. The crude oil so obtained is distilled into heavy oil, middle oil and petrol. Heavy oil is further hydrogenated, in plant exactly similar to that used for the hydrogenation of coal, to give middle oil and petrol. Middle oil resulting from these two steps is further hydrogenated in vapour phase converters, in which the vapourised light oil and hydrogen are passed over a solid catalyst. The crude vapour phase product is distilled, the residual middle oil being separated from petrol and treated again. The whole of the coal is thus transformed into a small solid consumable residue, gas and petrol. Creosote oil and low temperature tars, although they play no essential part in the main process of making oil from coal, are conveniently treated along with the coal. The final petrol, after a simple purification, is pumped to storage tanks beside the River Tees, from which it is shipped by steamers.

Mr. Ramsay MacDonald's Tribute

IN his opening address, Mr. Ramsay MacDonald said that a little more than a generation ago, oil was displacing coal as a source of power, and chemists began to wonder whether it was not possible to 'resurrect' coal. The German chemists were the pioneers and among them stands conspicuously the name of Dr. Bergius. In 1921 he explained his ideas to the Department of Scientific and Industrial Research, and in 1923, under his influence, experiments were begun by the Fuel Research Station. "At that time, fortunately for the chemical industry, Sir Alfred Mond was living. . . . This country does not yet know what debt it owes to Sir Alfred Mond's vision. The result then was that the Government gave a subsidy to enable the necessary research to be prosecuted." In 1927 the experiments were taken over by the Imperial Chemical Industries; that secured that they would be conducted on the scale, and with the expenditure, necessary for their success. As a result of these experiments, the Government again came in. On July 17, 1933, Mr. MacDonald announced in the House of Commons that the Government would guarantee a preference to all British-produced motor spirit; and in March 1934 Parliament passed the Hydrocarbon Production Act. "Few announcements have had such far-reaching results. The immediate effect was that Sir Harry McGowan, that man of vision and energy, announced that Imperial Chemical Industries would at once proceed to erect a plant, and we are here within a year and a half to open it."

Sir Harry McGowan's Reply

SIR HARRY MCGOWAN, on behalf of Imperial Chemical Industries, Ltd., thanked Mr. Ramsay MacDonald for his address. He said that the opening of the Billingham plant has brought to a practical commencement an enterprise which has engaged the attention of his firm for many years. "We began at Billingham in 1927 on a very small scale indeed. For two and a half years research continued on a moderate scale, and by then it was clear that to achieve success a bold expansion policy was essential. Notwithstanding the discouraging business conditions of 1930 and 1931, we launched in those years an extended programme of work at a heavy annual cost. . . . In the end we spent more than a million pounds on this research." During this period active encouragement was given by H.M. Government and interest was displayed in the work by the Fuel Research Board. Similar activities were proceeding abroad though from slightly different angles. The German I.G. was at work on brown coal, the Standard Oil Company of New Jersey was occupied with petroleum oil, and the Shell Group were not inactive. "In 1931 we effected with these three companies a pooling of all interests in the hydrogenation process,