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,

including a provision for a complete exchange of information, which promoted a more rapid advance by bringing us into immediate touch with every development of major importance." The construction of this plant marks the culmination of eight years' work. "The chemists, engineers, metallurgists, draughtsmen, and workers may all be proud when they look at this plant. To name them is impossible, but without being invidious I desire to single out Mr. Kenneth Gordon, who has been in charge of the research work and construction of the plant, and also my colleague Colonel Pollitt, who was the inspiration of our earliest efforts."

Tercentenary of Wilhelm Schickard (1592–1635)

ON October 23, 1635, in the middle of the Thirty Years' War, Wilhelm Schickard, a famous German orientalist and astronomer, died of the plague at Tübingen. Schickard was born on April 22, 1592, at Herrenberg, Württemberg. He was educated for the church, and at an early age became known for his knowledge of Hebrew. At the age of twenty-seven years he was appointed to the chair of Hebrew at Tübingen, and in 1631 was made professor of astronomy. He was also an inspector of schools at Stuttgart. In some of his least-known books are to be found early observations on the aurora, an account of the comet of 1623 which caused considerable commotion on its appearance, and his views on the refraction of light and the theory of the rainbow. He was known to both Kepler and Gassendi, and the latter, after he had observed at Paris the transit of Mercury of 1631 predicted by Kepler, wrote to Schickard: "The crafty god had sought to deceive astronomers by passing over the sun a little earlier than was expected, and had drawn a veil of dark clouds over the earth in order to make his escape more effectual. But Apollo, acquainted with his knavish tricks from his infancy, would not allow him to pass altogether unnoticed. To be brief, I have been more fortunate than those hunters after Mercury who have sought the cunning god in the sun. I found him out, and saw him, where no one else had hitherto seen him." Gassendi, in another letter of the same year, gave an account to Schickard of his fruitless efforts to see the transit of Venus.

Work of the Meteorological Office

THE annual report of the Director of the Meteorological Office for the year ended March 31, 1935 (London: H.M. Stationery Office. 9*d*. net), records a further big increase in the amount of information supplied to the public and to aviators, in accordance with a tendency that has been much in evidence for several years. The Aviation Services, for example, report a total increase of 18,747 in inquiries and of 2,404 in weather reports passed to aircraft in flight; in the British Climatology Division 2,348 general or scientific inquiries were dealt with, this figure including 178 legal inquiries, representing nearly a six-fold increase as compared with 1924–25 and nearly a doubling of the volume of inquiries in the past five years. While the main work of the Meteorological Office during the year under review has been on the same lines as in previous years, certain changes of organisation have been completed. Since the reorganisation after the War, there have been separate divisions for forecasts and aviation, but as experience has shown that this arrangement is not the best from the point of view of efficiency, the two divisions have been combined since October 1, 1934, control of the single large division by a single head, with two senior officers as deputies, being aimed at eventually. The Naval Division has for years been working in co-operation with the Admiralty towards the creation of a weather forecasting service within the Fleet which shall be self-contained but not independent of the State Meteorological Service; that objective has been attained with the expectation of its being in full operation by the end of 1936. Other important changes include a restriction of the responsibility of the Meteorological Office in the matter of gale warnings to the issue of the warning telegrams, the Board of Trade being responsible, as from September 1, 1934, for the exhibition of the warnings and the supply and maintenance of warning cones for that purpose; and the taking over by the Ministry of Agriculture and Fisheries and the Fishery Board of Scotland of the supervision of the stations of the Fishery Barometer and Barograph Service as from January 1, 1935.

THE fusion of the two branches of the Meteorological Office formerly known as the Forecast and Aviation Divisions, referred to above, does not involve any radical change in the system of dealing with weather forecasts and reports in connexion with aviation. Nevertheless, there have been some developments of the existing system. Consequent upon the increased practice by pilots of following direct compass courses on flights from Great Britain to the Continent, it was found necessary to alter the position of auxiliary weather reporting stations formerly established to serve the old Continental air routes. This has led to the closing down of the auxiliary weather reporting stations at Farningham, Deal, North Foreland and Sandgate, and the opening of new stations at Leatherhead, Crowborough and Bexhill, and to an increase in the personnel of the meteorological station at Manston Aerodrome to make practicable the issue of reports throughout the twenty-four hours. Another development was the installation at Croydon Airport of a 'ceiling projector'. This is a searchlight arranged to send a powerful beam of light vertically upwards, which enables the height of low cloud over the airport to be measured at night. The measurements are made at the meteorological station itself, and cloud heights are supplied in response to requests from pilots flying at night. Stations newly established within the period under review included one at Abingdon to meet the requirements of Central Area Headquarters of the Royal Air Force, and another similar station at the new Royal Air Force station at Mildenhall (Suffolk). Both these stations have personnel capable of obtaining information about the state of the upper atmosphere and making forecasts. These additions brought the number of local forecasting centres in Great Britain up to twenty-five.