in the basal part of the Coal Measures. The oil is concentrated in the crestal parts of minor anticlines forming part of a major anticlinal area which extends from the Trent at Rolleston to the vicinity of Ollerton. The Formby oilfield is a small accumulation in Keuper Waterstones sealed upwards by Glacial clay, and in this case the oil is produced from a depth of 100–120 ft. The structure is a faulted monocline, but it is thought probable that the oil has migrated upwards from a lower source, perhaps in the Carboniferous. Two deep borings have been made to explore the lower possibilities, but so far without result.

The gas-fields are at Aislaby in Eskdale, North Yorkshire, and at Cousland near Dalkeith, Scotland. In the former case the reservoir rock is a Permian limestone, and in the latter it is the sandstones of the Oil Shale Group of the Calciferous Sandstone Series. Short tests have indicated that the gas may be present in sufficient quantity to justify commercial exploitation.

The discovery of the Nottinghamshire oilfields resulted from geophysical work carried out, for the most part, by the staff of the Anglo-Iranian Oil Company. Seismic refraction arc surveys have proved to be the most successful method, whereas the reflexion method has given disappointing results. Gravity and magnetometer methods have also been used. These geophysical surveys have revealed the presence of a number of structural highs in extensive areas in eastern Nottinghamshire and in Lincolnshire, and a number of these have already been tested by drilling; although the ratio of success to failure has been low, the search continues.

An immense amount of new geological information on the stratigraphy and structure of the Carboniferous rocks below the Permian unconformity has been revealed by these borings. Coal seams of significant thickness have been penetrated by borings at Spital, Dunston and Stixwould, north, south and south-east respectively of Lincoln City. The coal seams lie at about 4,000 ft. depth, and although for this reason they are not likely to be mined in the near future, they represent a substantial addition to the known British reserves of coal. It is possible that coal seams at shallower depth may be present underground in the surroundings of the Wash or even in north Norfolk; the former possibility was already envisaged by Prof. Kendall many years ago. On the debit side of the coal account, the area north of Newark, both east and west of the River Trent, has been proved to lack coal seams of important thickness, while to the south of Newark there is a considerable area in which there is an exceptional development of volcanic rocks within the Coal Measures, at the expense of workable seams. Farther south, however, there is an improvement, as a boring at Widmerpool, eight miles south-east of Nottingham, has proved two good seams.

Another important by-product of the search for oil has been the discovery of potash salts of Permian age in Eskdale, North Yorkshire. Both sylvite and polyhalite are present, and this result shows that the potash deposits of the Zechstein Sea, which have such economic importance in north-west Germany, extend also into north-eastern England. The potash beds in Eskdale are at a depth of 3,650–4,775 ft. and, while this may exceed easy mining depth, there is a possibility that the deposits may extend farther north towards the Tees valley and rise to a lesser depth.

Inevitably, after several decades of rural spoliation by uncontrolled industry, a certain apprehension has been felt lest the development of oilfields might be at the expense of the amenities of the countryside of Britain, but it need not and has not been so. Every care has been taken to cause as little disturbance as possible; after a well has been drilled, the derrick is removed and only a small pumping jack marks the position of the boring. Electric power is used for pumping, and the motors are both small and silent. Buried pipelines carry the oil from the fields to a railway siding whence it is transported in tank cars to a refinery.

OBITUARIES

Engineer Vice-Admiral Sir George Goodwin, K.C.B.

ENGINEER VICE-ADMIRAL SIR GEORGE GOODWIN GOODWIN, who died at Havant on April 2, was the sixth to hold the important position of engineer-in-chief of the Fleet—an office created in 1847. The first two holders, Thomas Lloyd and Sir James Wright, were civilians, but after the latter retired in 1887, the holders have all been naval engineer officers: Richard Sennett, an inspector of machinery, following Wright and he in turn being succeeded by Engineer Vice-Admirals Sir John Durston, Sir Henry Oram, F.R.S., and Sir George Goodwin. These four distinguished officers were all products of the admirable system of training inaugurated by the Admiralty in the dockyards and at the Royal Naval College, Greenwich.

Goodwin, who was born in 1862, became an engineer student at Portsmouth and received part of his education in the Dockyard School. While still a boy, he attained the highest position in the Cambridge Local Examinations and thereby became available for a scholarship at the University of Cambridge. He chose to continue his naval career, however, passed through Greenwich with distinction and, except for about four years afloat, was afterwards employed either at Chatham Dockyard or at the Admiralty. He rose through the old ranks of assistant engineer, engineer and chief engineer, to the new ranks of engineer commander, engineer captain and engineer rear-admiral before, in 1917, on his succeeding Oram, reaching the highest rank at present open to a naval engineer officer.

In Goodwin's early days, there were many ships with low-pressure boilers and simple-expansion engines. He saw these types of machinery give way to compound- and triple-expansion engines, steam turbines, water-tube boilers and other important innovations. Known to a large number of officers afloat and ashore, he helped to bridge the gulf which existed between the engineering staff at the Admiralty and engineer officers in the Fleet, and on his retirement was entertained at dinner in the Grand Hotel, London—a unique occasion.

Among Goodwin's honours was that of the honorary degree of LL.D. conferred upon him when he attended the James Watt centenary celebrations at Birmingham in 1919, as the Admiralty representative. He was the first naval engineer to be so recognized by any university in Britain.

After his retirement from the naval service, Sir George Goodwin threw himself heart and soul into the work of various technical institutions, and in 1925 joined the old-established shipbuilding and engineering firm of J. Samuel White and Co., Ltd., of East Cowes, of which he became chairman.