

national ethnography and cultural history of Wales from the Act of Union of 1536 to the present day, with the proviso that the modern industrial civilization will not be covered, save to a limited degree. It will, therefore, concern itself with the trades and crafts, the ways of living and working, the domestic and industrial environment, and the clothes and customs of past generations of all ranks of the Welsh people. The enhanced status of this section of the National Museum is no more than due recognition of the value of a piece of work to which much time and research have been devoted by the responsible authorities, and from which important studies have already accrued. The collections at Cardiff illustrating the life and culture of the Welsh people—even more now that this opportunity for expansion is afforded them—provoke regret that no similar unitary collection deals in like manner with the folk history of England.

#### Future of Liquid Fuel Production

SIR PHILIP DAWSON'S presidential address to the Institute of Fuel on October 15 entitled "Road, Rail and Fuel" emphasized our dependence on imported liquid fuel, and especially motor spirit. He stated that in the present year, Germany will produce more than fifty per cent of her needs of light motor fuel. The use of Diesel fuel is increasing in all forms of transport. Discussing the relation of road and rail, he said that the former employs almost twice as many persons as the railways, and in ten years the number of railway employees has fallen by fourteen per cent. Sir Philip advocated an extension of railway electrification, but pointed out that this would involve a big reduction in the consumption of coal, even were the power generated from steam boilers. At the same meeting Dr. Franz Fischer, of the Kaiser Wilhelm Institut, Mulheim, delivered the Melchett Lecture to the Institute, taking as his subject the conversion of coal into liquid motor fuels and other products by way of carbon monoxide. Having indicated the advantages of beginning with a single pure gas such as carbon monoxide rather than raw coal, as in direct hydrogenation, Dr. Fischer traced the development of his work from 1921 until the present stage when large-scale plant is in use. Very extensive efforts were necessary in the search for a suitable catalyst and a method for adequately purifying the gaseous raw material. Hydrocarbons ranging from petrol to paraffin wax are obtained by this 'Kogasin' synthesis. Thus these researches have shown that from coal and water all necessary liquid fuels would be obtainable from coal even if mineral oils were entirely exhausted. Fischer's process offers the advantage over the process of direct hydrogenation, that high pressures are not used and that only plant of common materials, easy to fabricate, is required.

#### Electric Services in Buildings

MR. H. T. YOUNG, who is connected with the installation and contracting section of the electrical industry, gave his presidential address before the Institution of Electrical Engineers on October 22.

In the early days, electrical installations in buildings were for lighting and bells. Wood casing was used, and, so far as possible, it was concealed from view. Cables, wires and equipment were placed anywhere where they would be out of sight. Now new and larger buildings are being erected all over the country, and electrical contractors are having difficulty in doing their work satisfactorily under the new conditions. The steel and concrete buildings of to-day, if once completed, are almost impregnable to electric services. The item in electrical accounts entitled "cutting away and making good" averages about ten per cent of the cost of the whole installation. In new buildings which are planned and designed for electrical services, this item is much smaller and the time of building is accelerated; Mr. Young urged that channels, ducts and conduits for the reception of wires and cables should be considered in the future as an integral part of the building from the point of intake to the outlets. In the United States and Canada, underfloor duct systems have been adopted for more than ten years as standard practice in nearly every type of building, except private houses. The ducts are made of steel or fibre and are laid in the floor during construction. In Great Britain, a beginning of the duct system has been made. Three ducts are used, one for telephones and signalling wires, one for heating and power, and one for lighting.

MR. YOUNG showed lantern slides of installations in progress and completed where electrical engineers and architects have planned their work together. In particular, he mentioned the new buildings of the University of London, which he said are the most interesting buildings in the course of erection in the country to-day, and also seem to have the most complete electrical installation, as the lighting, space-heating, water-heating, and many other services are all electric. There is one flue only, and that is for a coal fire in an official's study. In blocks of flats in London, arrangements are now being made for the reception of sound and television services. These are taken from one central aerial system and distributed by cables to a terminal box in each flat. The tenant receives both services on his own equipment through a 'socket outlet' and plug attachment. A special type of cable is used for carrying the extremely high frequency currents used in television. The estimated total annual consumption of all-mains radio sets is 300 million units. This equals twice the estimated load in 1910 for lighting, heating and cooking. He mentioned that a large store in London (Selfridge's) has an annual consumption of electricity ( $7\frac{1}{2}$  million units) which equals that of places like Weymouth, Perth, or the whole of the Isle of Wight. There are other buildings in London, such as stores and hotels, which consume five million units per annum. He considers that none of these could be described as fully equipped electrically.

#### The Training of the Engineer

IN his inaugural address as president of the North-East Coast Institution of Engineers and

Shipbuilders on Friday, October 23, Prof. C. J. Hawkes took as his main theme "The Training of the Engineer" and, as a background, his work and experience in the revision of the engineering degree courses at the University of Durham lent an unusual interest and value to his remarks. Engineering is not a science but an art depending on science and, between the two, there are still many gaps, which the engineer has to bridge. His decisions have to be in a form capable of being translated into practice, and he has to be trained to make use of established scientific principles in conjunction with a knowledge of the needs of the world, of the natural forces to be contended with, of the properties of the materials to be used, of the capacities and limitations of those through whom the work has to be done and of the plant, tools, and machinery on which the processes depend. Prof. Hawkes indicated how the curricula at Durham have been revised to comply with these comprehensive demands. The more human aspects are provided for by weekly reports and discussions in college, and by the personal contact during the workshop training with men of all classes, perhaps the most broadening influence that could be found. By the limitation of available time, the graduate course is mainly confined to the study of scientific principles and their applications. Such subjects as economics, works organization and administration are considered preferably as post-graduate studies. Prof. Hawkes also took occasion to report the progress of research work at Armstrong College, which has been greatly fostered by the members of the Institution he was addressing.

#### Observatory for St. Albans High School for Girls

ON October 23, Sir Frank Dyson inaugurated at St. Albans High School for Girls the observatory recently bequeathed to the school by the late Dr. William Alfred Parr. Dr. Parr, a well-known amateur astronomer and past-president of the British Astronomical Association, resided in St. Albans during the last few years of his life, and had erected in his garden a small but well-equipped observatory, containing a four-inch clock-driven equatorial by Cooke, with a photo-visual object-glass, Evershed solar spectroscope and other accessories. The entire observatory, which is of wood, surmounted by a 10-foot revolving dome, was, with its small annexe, removed from Dr. Parr's garden during the summer, and re-erected in the school grounds near the new gymnasium, under the supervision of Dr. W. H. Steavenson. Following an address by Sir Frank to the staff and pupils, assembled in the latter building, the observatory was formally opened and dedicated with picturesque ceremony, the Dean of St. Albans, the senior science mistress and the head girl taking part.

#### Food and the Family Budget

THE Engineers' Study Group on Economics, which was formed towards the end of 1933 to investigate the economic and social problems presented by the co-existence of poverty and actual or potential

plenty, has now published its investigations on family budgets in a pamphlet entitled "Food and the Family Budget" (Engineers' Study Group, Hazlitt House, Southampton Buildings, W.C.2. 1s. 6d.). This investigation has been confined to conditions as they exist in Great Britain to-day. The problem is treated quantitatively, and an attempt is made to deduce some general minimum standard of living which would be both desirable and practicable. The method used was that of analysing and comparing published data on family budgets, at the same time taking into consideration modern trends in consumption and requirements indicated by scientific research. The total budget required to provide the minimum standard desirable was found for a "statistical average family" of 3.72 persons to be about £6 per week (equivalent to about 63s. per week for each wage earner) and of this sum about 37s. a week would be required for expenditure on food. The suggested food budget is shown to be compatible with (a) the dietetic requirements laid down by the British Medical Association Committee on Nutrition; (b) actual national consumption; and (c) the increased consumption of home-grown foodstuffs that would raise the dietetic standard to a level adumbrated by Sir John Orr. There is little doubt, it is stated, that a large part of the population is suffering from lack of nutritious foodstuffs, particularly fresh dairy produce, fruit and vegetables.

#### Noise on the Road

THE Departmental Committee which was set up in 1934 by the Minister of Transport, under the chairmanship first of Sir Henry Fowler and afterwards of Dr. G. W. C. Kaye, to study the question of motor-vehicle noises, has issued its second interim report (London: H.M. Stationery Office. 1s. net). The report elaborates and extends the first report of the Committee, which dealt with new vehicles including motor-cars, sports-cars, motor-cycles and goods- and passenger-carrying vehicles. It appears from the report that a consensus of opinion considered that a loudness of ninety British standard phons represents in general a transition point between tolerably noisy vehicles and unduly noisy ones. Two types of tests are therefore proposed by the Committee: (a) normal-running tests in which a vehicle running under full throttle at 30 m.p.h. must not generate an overall noise exceeding 90 phons at 18 feet lateral distance; (b) racing-engine tests in which a stationary vehicle the engine of which is racing at maximum-power speed must not generate an overall noise exceeding 90 phons at 25 feet behind the open end of the exhaust pipe. A temporary tolerance limit is suggested for motor-cycles and commercial vehicles. In the meantime, the Minister has received an assurance from the manufacturers of motor-cycles and sports-cars, which are among the chief offenders on the road, that no new vehicle shall in future leave their works the noise of which can be regarded as offensive. The Ministry of Transport is proposing to set up six noise-testing stations to assist the industry in this laudable object. Meanwhile, work is