

Fuel Industries Research at Leeds*

IN his Report for the session 1934-35 to the chairman and members of the Livesey Advisory Committee on the work of the Department of Coal Gas and Fuel Industries (with Metallurgy) of the University of Leeds, Prof. John W. Cobb is able to record progress in the increased number of first year students, in the recognition by industry of the value of graduation in this Department, and in the acceptance by the Institution of Civil Engineers of the degree in lieu of one or more sections of the associate membership examination. The Department carries on continuous research on problems connected with fuels and refractory materials, and for some years has been conducting an extended investigation of the influence of furnace atmosphere on the scaling of steel. This work has been encouraged and advanced by grants from the Iron and Steel Federation and, through the Iron and Steel Institute, from the Carnegie Research Fund. The recent work in this research has been directed towards the metallurgical aspects of the influence of sulphur compounds on the scaling of steel, more particularly in relation to the treatment of special steels.

Arising out of a study of carbonisation reactions in which the careful fractional distillation of cellulose, at temperatures up to 1,200°, were effected by special procedure, new light has been thrown on the course

* The University of Leeds: Department of Coal Gas and Fuel Industries (with Metallurgy). Report of the Livesey Professor (John W. Cobb) for the Session 1934-35. Pp. 11. (Leeds: The University, 1936.)

of the thermal decomposition of organic compounds. Then again, from an examination of the influence of certain surfaces on the cracking of the volatile products of coal carbonisation, the results obtained have suggested a method of modifying the character of tars which is expected to prove to be of practical value. The co-relation of the properties of cokes with their behaviour on combustion in the open grate, and the changes produced in lump coke when partially gasified, were also made the subjects of investigation and study.

An examination by Dr. A. L. Roberts of the torsional strength of refractory materials at different temperatures has been continued. On this subject a paper dealing particularly with the influence of vitreous and crystalline silica was read before the Ceramic Society in November last. In addition, he has made a study of the action of steam and other gases on refractory materials at comparatively low temperatures, and of the variation in their properties in planes at right angles.

A further activity of the Department is in co-operation with the Institution of Gas Engineers in carrying out research under the Joint Research Committee. Recent work has included the investigation of the corrosion of metals in gas appliances, and analyses of tests made on water gas plants to ascertain the influence of moderating the operating conditions, a subject on which very little direction is available as yet.

The Nutritive Value of Milk

A MEMORANDUM on the nutritive value of milk has been prepared by the Advisory Committee on Nutrition which was appointed last year by the Minister of Health and the Secretary of State for Scotland*. It points out that milk is the only food which contains nearly all the materials essential for growth and maintenance of life, in a form ready for utilisation by the body. Mothers' milk is the ideal food for the young of the same species, and milk of another species is the next best food for the nutrition of young mammals. The milk of any species of animal, provided it is palatable, is also an eminently suitable food for human beings, especially during growth, pregnancy and lactation.

Cows' milk contains protein, fat and carbohydrate, all the known vitamins and a variety of mineral elements necessary for normal nutrition. It is the most valuable food known for the promotion of growth and health in children. The present consumption of liquid milk is about 0.4 pint per head per day: if the average consumption could be increased to one pint, there would result an improvement in the general health of the community,

* The Nutritive Value of Milk: Memorandum by the Advisory Committee on Nutrition. Issued by the Ministry of Health and the Department of Health for Scotland. Pp. 12. (London: H.M. Stationery Office, 1936.) 3d. net.

especially in the case of children, in whom it would secure better bone formation and improvement in stature and physique. The incidence of disease, including rickets, would be diminished and the resistance to dental caries increased.

The few disadvantages of milk as an article of diet can be easily overcome: for infants it should be supplemented with iron and vitamins C and D. Children and nursing and expectant mothers should take about two pints a day: other adults should consume not less than half a pint a day, to ensure an adequate intake of calcium. The only significant changes effected in the composition of milk by heat are a partial loss of vitamin C and possibly of iodine: these deficiencies can be made good in the diet of babies fed exclusively on cows' milk by the addition of fruit or vegetable juice and cod liver oil, and in a mixed diet by potatoes or other vegetables or fresh fruit and some sea fish. Unless the milk comes from perfectly healthy cows, it should be boiled or pasteurised before use. Separated milk has a high nutritive value since it contains the bulk of the essential dietary constituents found in whole milk: whey, on the other hand, is a less complete food but would add considerably to the nutritional value of a diet containing cereals and cereal products.