

Nottingham. This comprised a brief history of the utilisation of gas as a fuel for internal combustion engines, together with an assessment of its economic possibilities in competition with petrol and heavy oils. Comparisons of the usefulness of gas and petrol for internal combustion engines are not unfavourable to the former. A higher thermal efficiency is obtained with gas than with petrol; the carbon monoxide content of exhaust gases is very much lower than with petrol; starting is as good; flexibility and acceleration are superior to petrol when the engine is cold; and it is quite as safe in use as petrol. The chief drawback to gas as compared with petrol is, of course, the difficulty of carrying a sufficient quantity for any considerable mileage. Latterly, however, various firms have been experimenting in the production of light high-pressure cylinders. The real competitor of gas for road transport services is heavy oil, and at present virtually no comparison can be made between these two fuels, since in every case the greater the annual mileage, the greater the economic superiority of heavy oil. The balance in favour of heavy oil might be substantially reduced by a rise in its price; an allowance in respect of the weight of vehicle cylinders when assessing licence duties; development of a special engine for gas propulsion; or by the enrichment of coal or coke-oven gas. Without such adjustments, gas cannot enter into successful competition with heavy oil for road transport service.

Fireproofing of 'Fireproof' Buildings

At the discussion of the American Steel Institute at White Sulphur Springs, Va., on October 17 on 'fireproof' structures, Dr. Ingberg, of the National Bureau of Standards, stated that in steel-framed buildings it is necessary to protect the steel by a concrete covering. In a report of the discussion issued by Science Service, Washington, D.C., it is pointed out that steel supports at high temperature sag under the terrific weight of the superimposed structure. The problem before those responsible for the fire-prevention code is to ensure that sufficient covering is given to the steel members of a building to prevent the temperature giving rise to dangerous conditions. According to Dr. Ingberg, tests have shown that for moderate rises in temperature—300°–600° F.—the strength of steel girders increases as much as 25 per cent. Above 600° a decrease occurs, and hence safety considerations make it imperative that protection in the form of a complete concrete covering must be provided. Apart from the question of safety and avoiding risk of collapse of the roof and other parts of the building owing to excessive temperature rises during a fire, it is necessary to prevent excessive relative expansion between the various parts of the structure.

Oil-Finding Methods and Oil-Made Chemicals

THE National Research Council recently organised a five-day, 2,000-mile tour of industrial research laboratories for fifty-two leading business men. Science Service, of Washington, D.C., gives an account of their visit to the laboratories of the Gulf

Refining Company and the Mellon Institute for Industrial Research. Dr. Paul Foote, director of the former concern, described how explosions of dynamite are used to send sound waves to a depth of 10,000 ft. into the earth where they encounter rock structures and are reflected; by their speed, reflecting and refracting behaviour they indicate the nature of the underlying deposits. He was also able to show the visitors a collection of new chemicals derived from oil products, some of which have powerful destructive qualities. Dr. E. R. Weidlein, director of the Mellon Institute, pointed out that employment had been provided there for 97 trained scientific workers and 48 assistants during the last year. Their work concerned chiefly industrial problems of manufacture, but had included specifically research into the use of carbon black as a colouring material for concrete highways to minimise the glare of lights, the use of chemical metaphosphate in laundering and the bonding of tile products to steel for exterior construction use.

Animal Road Fatalities

SCIENCE SERVICE, of Washington, D.C., gives an interesting but somewhat alarming summary of Dr. Dreyer's statistical report of animal road deaths, made during a journey of 2,550 miles. Dr. Dreyer counted sixty-one dead animals on the road. This included cats, dogs, birds, snakes and turtles. Contrary to expectations, more turtles than chickens met their death in this unhappy way, there being counted eighteen of the former and only three of the latter among the total. Of the other animals listed, after turtles, which headed the list, skunks were the most unfortunate. Dr. Dreyer's census is of particular value in that little attention has hitherto been paid to animal road fatalities in the campaign against loss of life by the motor-car.

The Population Problem in Bengal

THE population of Bengal, 50·1 millions with a mean density of 646 per square mile, would seem already to have passed the stage when its needs can be met by the area it occupies. In seeking a remedy, one school supposes that if we "look after the death-rates, the birth-rates will look after themselves", and another suggests that "if we keep down the births, the deaths will keep down themselves". Cedric Dover, in a critical survey of the situation, concludes that control of the birth-rates is likely to furnish a more useful contribution than exclusive attention to death-rates (*Population*, 2, No. 1, November 1935, p. 90). A maximal population cannot be maintained above the bare subsistence level, even with radical progress in economic prosperity. The population of Bengal has already outgrown its resources, and the time seems to have come when eugenic control of population growth should be introduced.

The Nucleus of the Atom

WE have received a symposium entitled "The Nucleus of the Atom and its Structure" from the Ohio State Chapter of the Sigma Xi Society which contains a quantity of information not easily accessible