room and laboratory for a lecturer, and the Advanced Organic Laboratory used by second- and third-year honours students.

The third floor contains the private rooms and laboratory of the professor of organic chemistry, common rooms for staff and research students, and a third lecture theatre to seat 50, with a preparation room and museum. A large and completely equipped laboratory provides accommodation for thirty research workers in organic chemistry, and there are, in addition, a private room and laboratory for one or two members of staff, and a special-purposes laboratory in which are hydrogenation apparatus for operation on various scales from quantitative micro-work to fairly large-scale pressure autoclaves, shakers, a multiple molecular still, refrigerators, apparatus for the quantitative determination of deuterium, filter presses, a large vacuum evaporator, vacuum oven, ozonizer, etc. On the roof there is a laboratory with windows on three sides arranged for experimental work with noxious fumes and equipped with a concrete bench for all-night operations involving gas heating and the use of water. Adjoining is the air-conditioning plant which pumps filtered and warmed air into every room. The temperature of the incoming air, and thus largely that of the building, is controlled by thermostats at key points, and foul air automatically finds its way out of the building aided by fume-cupboard fans through acid-proof ducts. In the laboratories the air is changed six times an hour, and in the lecture theatres twelve times. The fume cupboards in the organic laboratories are situated in the windows.

The benches have been designed so as to render all the services easily accessible, and in case of necessity any service on any bench can be cut off in a few moments without interfering with that service to the remaining benches in the laboratory. The services available to the benches are suited to the type of work carried out on them, and include in the majority of cases electric current at mains and low voltages, hot and cold water, gas and steam. Where requisite, vacuum and compressed air are also provided.

INSTITUTION OF GAS ENGINEERS AUTUMN RESEARCH MEETING

THE fifteenth Autumn Research Meeting of the Institution of Gas Engineers was held in London, under the presidency of Mr. C. H. Chester, during November 29-30—the first since the gas industry passed into the control of the National Gas Board. The technical matters discussed revealed the continued search for sources of raw material available for making gas or new techniques for carbonization or gasification of solid fuels.

Of great interest was an account of new experience on the process of gas purification with oxide of iron. In Great Britain statutory requirements for the removal of hydrogen sulphide from town's gas are extremely exacting. The method consists in passing the unpurified gas over suitable oxide of iron contained in large boxes, and the process, though effective, has certain disabilities which cause a perpetual if unsuccessful search for substitutes. These disabilities are due to the size and cost of the plant, coupled with the amount and cost of the labour used in operation. In the past, the latter has been due largely to the caking of oxide of iron after 'fouling',

and this has been ascribed to accumulation of tarry matter and of salts insoluble in water, in addition to the sulphur deposited. F. J. Dent and L. A. Moignard have put forward a new explanation, although a hint of this was given by H. B. Avery in 1939 when he observed the disintegration and migration of iron in the mass of used oxide. Arising from this, Dent and Moignard have developed an explanation of the caking and hardening of the oxide. In the purification process, the foul gas leaves a film of iron sulphide on the surface of the oxide which, assisted by the moist condition, leads to a migration of iron sulphide and its deposition at points of contact of the material comprising the charge of oxide. This deposit provides the cement for the construction of the hard cakes actually found and causing the above-mentioned difficulties; laboratory tests show that caking can be obtained in the absence of tarry and other deposits. This work has provided, for the first time, a plausible mechanism for the purification of coal gas by means of oxide of iron, and it should be possible, by its application, to secure advances in the efficiency and economy of purification processes.

Removal of tar is, however, necessary in order to recover clean sulphur, which is promoted by the almost complete removal of tar-fog from the gas by electrostatic precipitation. In a paper by K. W. Francombe, it is shown how this technique is growing and will soon be universal practice. R. H. Williamson and J. E. Garside described another way for operating a process of purification without the trouble of caking, that is, to use the new technique of 'fluidization'. The oxide of iron in finely divided condition is carried in a state of suspension by the gas to be purified; in this way the whole process of 'fouling' and 'revivification' is completed without the formation of caked aggregation. On a laboratory scale a measure of success has been obtained.

In the past, town's gas has been obtained by the carbonization of coal, leaving a residue of coke, or by the gasification of solid fuel which has necessitated the use of mineral oil. In recent years, attempts have been made to replace these oils by gaseous hydrocarbons obtained by synthetic processes. F. J. Dent and D. Hebden have described synthetic processes on two lines: (a) at atmospheric pressure from a type of 'blue water gas', and (b) at a pressure of 20 atmospheres with a hydrogen-rich gas such as could be obtained by pressure gasification of coke or breeze. The results hitherto obtained show such promise that the Gas Research Board is taking steps to continue this work on a larger scale. The synthesis of hydrocarbons from coal to replace those obtained from imported oils and from high-grade bituminous coal would be of considerable national importance.

The manufacture of fuels by carbonization or gasification of coal usually creates trouble by formation of noxious liquid effluents, especially in Great Britain where population is dense and rivers are small. The trouble arises because of poisonous materials such as cyanides, tar acids and bases, and sulphur compounds which remove dissolved oxygen necessary for fish and other life. The new Gas Act of 1948 has placed the responsibility for avoiding the pollution of rivers on the area gas boards. This difficult problem has long been a source of concern to the gas industry and an increasing subject of research. E. H. M. Badger gave an account of the problem of effluent liquor disposal in all aspects. A plea was made for more collaboration by all parties.

H. J. HODSMAN