SHELL DEPARTMENT OF CHEMICAL ENGINEERING, CAMBRIDGE

IN March 1945 the University of Cambridge gratefully accepted the offer of the Shell Group of Oil Companies to found a School of Chemical Engineering. This generous gift amounted to £435,400 and was accompanied by an offer to make an annual sum of £2,500 (later increased to £3,000) available until further notice, thereby forming the Shell Chemical Engineering Studies Fund.

The first Shell professor of chemical engineering, T. R. C. Fox, took up his appointment in October 1946 and teaching started in October 1948. Since that time 187 students have graduated in chemical engineering and the teaching staff has grown to its present establishment of six lecturers, three demonstrators and an assistant director of research (two of these posts are vacant at present).

The teaching in the Department consists of a two-year course taken either after Part 1 of the Natural Sciences Tripos or Part 1 of the Mechanical Sciences Tripos. This course leads to the Chemical Engineering Tripos, normally taken in the fourth year. From the outset it has been the aim of the Department to provide a scientifically based training both for those who have been led to the subject through their interest in chemistry and for those whose primary training has been in engineering. It is not the intention to mould these two groups into a single pattern but rather to modify both and let them temper one another. In this way the Department has pioneered a new development in chemical engineering education.

Graduates in chemistry or engineering from other universities may also be admitted to the course, which qualifies them for the B.A. degree.

In the early days the Department was housed in a temporary single-storey building in Tennis Court Road; eventually 9,000 sq. ft. of temporary accommodation was provided on this site. After the exploration of many alternative schemes, a permanent site adjacent to the Cavendish, Metallurgy and Zoology Laboratories was allocated in 1955. Mr. J. Murray Easton was appointed architect and a building with a net floor area of 22,000 sq. ft. was designed to replace and incorporate parts of the old chemical laboratory. Work on the building started in November 1956 and the Department began to move into the first section of its new building early in 1959. The main group of laboratories was opened by Lord Godber, chairman of the Shell Group of Companies, on December 9, 1959 (Fig. 1).

The Laboratories of the Department are partly in a new steel-framed building of five floors and partly in the four-storey building along the Pembroke Street frontage, originally built in 1907, which has been virtually rebuilt internally. The last stage of the rehabilitation of the 1907 building (the ground floor now occupied by the Chemistry Laboratory) will begin in June 1960. The two buildings have been welded into a whole by a new staircase which feeds floors in the converted building from half landings.

The basic design envisaged relatively large-scale experiments being carried out at the lowest level (in what the Department terms the Unit Operations Laboratory (Fig. 2), which is 48 ft. × 45 ft. × 22 ft. high) with adjacent service workshops, stores and instrument laboratory. On the first floor are centred the teaching activities with lecture rooms, library, chemical laboratory and cloakroom. On the second and third floors are eleven combined office-research laboratories for teaching staff, five small research laboratories and one large research laboratory for chemical bench work. Existing structural and service limitations restricted the use of the converted 1907 building. A bank of six constant-temperature rooms (four having 16–17 ft. headroom) are built in the region of the junction between the two buildings, and on the first floor advantage was taken of the headroom to provide a ramped lecture theatre capable of seating both first- and second-year classes together. The basement is used for stores and mechanical services and a new roof structure was built to provide a drawing office and common-room in place of a group of attics at various levels.

In the Unit Operations Laboratory which passes through two floors there are galleries to permit access to apparatus at 4 ft. and 11 ft. above floor-level. There is also a central well 5 ft. deep and provision in five places to pass through the floor of the laboratory above, so increasing the effective ceiling height at these points from 22 ft. to 35 ft.

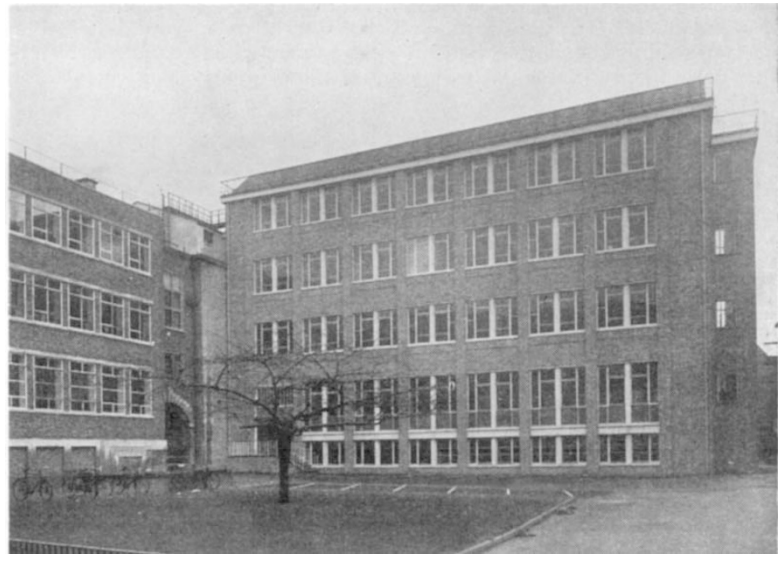

Fig. 1. New building for the Department of Chemical Engineering, Cambridge

© 1960 Nature Publishing Group

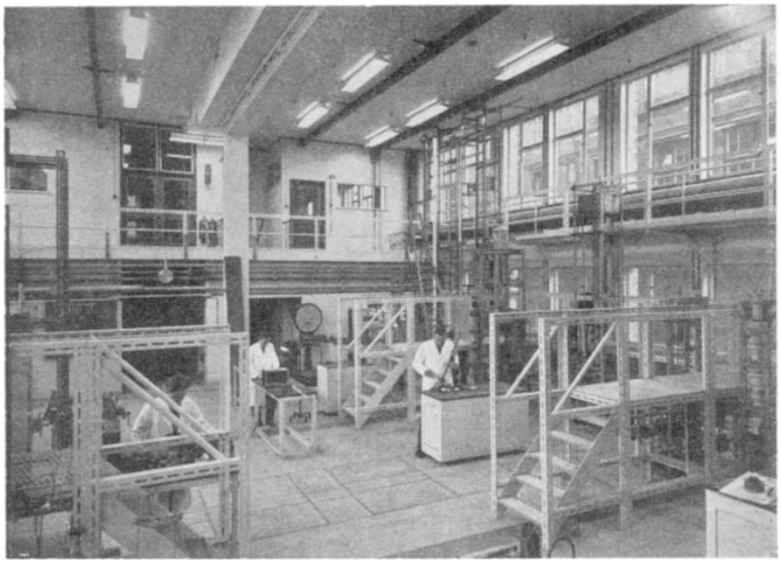

Fig. 2. Unit Operations Laboratory

Each experimental position in the laboratory has steam (10 and 100 lb./sq. in.), compressed air (10 and 100 lb./sq. in.), gas, water and electrical (60 amp.) services. These services are provided by: (1) two steam ring mains operating at variable pressures and supplied by three boilers with a combined capacity of 2,500 lb./hr.; (2) two compressed air ring mains (one 5 in. in diameter for part of its length) operating at variable pressures up to 100 lb./sq. in. and supplied by four reciprocating compressors providing up to 540 c.f.m.; (3) two water ring mains fed from a 6,000 gal. capacity tank in the roof. In the case of both air and steam there is a cross-over pipe network to permit any compressor or boiler to feed either of the pair of ring mains. Additionally there is a general ventilation extract system, balanced by a warmed air intake, and there is also a furnace extract system.

Fume cupboards in the research laboratories have been installed in the centre of the building in spaces between ducts. The fume cupboards are of the 'walk in' type and as the tray at bench height is removable they may be used for high towers and similar apparatus. They are finished internally with an epoxy resin. The cupboards are arranged in vertical banks of three, each bank being exhausted by a single fan. Two of these banks have interconnecting, lined trunking to permit the installation of apparatus approximately 6 in. × 12 in. through three floors, that is to say, approximately 40 ft. high in what becomes effectively a single fume cupboard. Provision has also been made to install apparatus if required in ducts (5 ft. 6 in. × 3 ft. 6 in.) which run almost the full height of the building. These ducts are now fitted with removable floors and used as cupboards.

In the earlier years of the Department's existence, research work necessarily took second place to the development of the teaching programme. However, its importance has steadily increased, and to date twenty-one research students have submitted work for research degrees.

A feature of the Tripos course is that students carry out a modest research project during their final year, rather than a formal laboratory course in chemical engineering operations. Some information of genuine value has been obtained.

The industries or other fields of employment entered by graduates on leaving are as follows:

Petroleum and petrochemicals	29
Chemicals (excluding petrochemicals)	80
Chemical plant manufacture	21
Atomic energy	23
Miscellaneous	34

The original staff of the department is now widely dispersed. Prof. K. G. Denbigh was the first professor of chemical technology at Edinburgh, Prof. E. S. Sellers became the first professor of chemical engineering at Swansea, Prof. J. M. Kay is at the Imperial College, London, and Prof. P. V. Danckwerts has recently returned from the Imperial College to take up the Shell professorship following the resignation of Prof. T. R. C. Fox, who is to continue teaching work in Cambridge in the Engineering Laboratory.

THE SCIENCE MASTERS' ASSOCIATION

NEARLY seven hundred science teachers from many parts of the British Isles gathered for the annual meeting of the Science Masters' Association, which was held in the University of Southampton during December 29, 1959–January 1, 1960.

There was a large attendance at the Guildhall on the evening of December 29, when members of the Association were welcomed to Southampton by the Mayor, Mrs. R. M. Stonehouse. The civic reception was followed by a lecture, illustrated in colour, on "Southampton Borough Archives" by the Borough archivist, Mr. Bruce Jones, and members were able to examine some of the historic treasures of Southampton, which were displayed with models and illustrations of modern educational buildings prepared by the Borough architect, Mr. L. Berger.

The programme included lectures and demonstrations, visits, discussions, films and, in addition to the usual members', manufacturers' and publishers' exhibitions, a number of special exhibitions which attracted considerable interest.

The morning sessions were devoted to lectures and discussions which fully maintained the high standards of the annual meeting. Of special interest to physicists were the lectures by Prof. A. M. Taylor on "Some Demonstrations in Light and Colour" (which

© 1960 Nature Publishing Group