

CAREERS

with the

Industrial
Group



United Kingdom Atomic Energy Authority

C o n t e n t s



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Careers
FOR
UNIVERSITY GRADUATES
IN THE
INDUSTRIAL GROUP



UNITED KINGDOM ATOMIC ENERGY AUTHORITY
INDUSTRIAL GROUP HEADQUARTERS
RISLEY - WARRINGTON - LANCASHIRE

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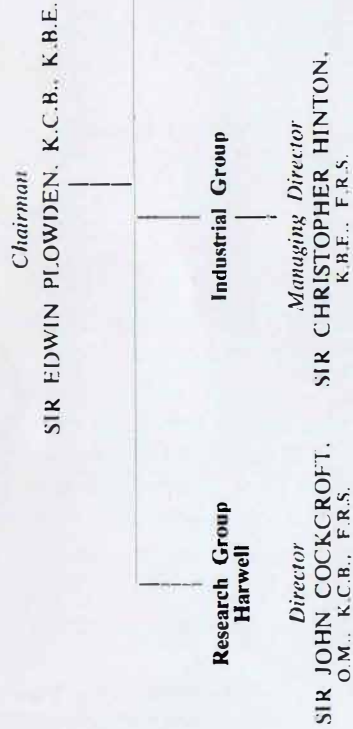
A landmark of outstanding importance in the history of British Industrial development was reached in October 1956, when Calder Hall Nuclear Power Station fed electricity in significant quantity into the national grid system. The Industrial Group of the United Kingdom Atomic Energy Authority was responsible for the design, construction and operation of the Calder Hall Nuclear Power Station in Cumberland.

The story of the design, development and operation of this unique power station is the story of a pioneering organisation comprising engineers, chemists, physicists, metallurgists and mathematicians who, by fine team work, have shown that the ambitious British plan for building twelve nuclear power stations by 1965 is not only feasible but capable of considerable expansion. At this stage the Industrial Group has already begun to design and develop for civil use other reactors of more advanced types.

The Calder Hall Nuclear Power Station is not the only major achievement of the Industrial Group of the United Kingdom Atomic Energy Authority. This Group now has six factories operating or in course of construction. Each has a different function to perform in atomic energy development and production. At one of these establishments, Dounreay in Scotland, there is under construction a fast breeder reactor, which is one of the most ambitious atomic energy projects yet undertaken.

The future of nuclear power, and with it in large measure the prosperity of the country, depends upon the Atomic Energy Authority. The work is new and exciting and gives tremendous satisfaction. The Industrial Group of the Authority offers scope for those who wish to use their talents in this way, as the following pages show.





Engineering Branch
Risley

Design work is centred at Risley. Construction work at sites throughout the Group.

Research and Development Branch

H.Q. at RISLEY
Laboratories at:
CULCHETH
SPRINGFIELDS
WINDSCALE
CAPENHURST
DOUNRFAY

Operations Branch

H.Q. at RISLEY
Works at:
SPRINGFIELDS
WINDSCALE
CAPENHURST
CALDER HALL
CHAPELCROSS
DOUNREAY

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RISLEY

The Headquarters of the Industrial Group is situated at Risley, near Warrington, in South Lancashire. Under the Managing Director, the responsibilities of the Group are divided between six Branches — four Technical Branches, an Administrative Branch and an Accounts Branch.

Engineering

The Engineering Branch of the Industrial Group is a large and powerful body capable of taking a difficult and complicated proposal for a nuclear reactor or a chemical plant and carrying it through all stages of design and construction until the completed plant is ready to be handed over to the operating staff. Such a proposal may arise as the result of a reactor feasibility study carried out by the Research Group at Harwell or, in the case of chemical plants, as the result of laboratory work at Harwell or in the Research and Development Branch of the Industrial Group. It will be recognised that the design and construction of a nuclear reactor or a radioactive chemical plant demands contributions from all fields of engineering.

The organisation of the Engineering Branch includes architects, structural engineers, quantity surveyors, civil, mechanical and electrical engineers, a large construction organisation for controlling work on sites, a supply branch and a very strong inspection and progress department, as well as the main project design teams.

During the design and construction of any major project, the focal point for the whole of that work within the Engineering Branch is one of its main design offices. For example, throughout the design and construction of the Calder Hall reactor, the Thermal Reactor Design Office was the centre point of all activities connected with that job. This office was responsible not only for detailed design of the reactor, but also for financial control of expenditure and overall management of the project until the time it was handed over to the operating staff. During this period this design office could call upon the assistance of all the specialist engineering services mentioned above.

The research and development programme never ceases when design of a plant begins and information from such work will continue to be incorporated into the design from time to time. It may be found that desirable additions or modifications may conflict with design work already completed and it is then up to the Chief Engineer of the design office to maintain a proper balance so as to get the most suitable plant to meet both the financial estimate and the date set for the completion of the programme.

Technical Policy

The expansion of atomic energy facilities requires careful long-term planning and skilful scientific, technical and economic assessment of the overall technical policy of the Industrial Group. The technical policy of relations with Overseas Atomic Energy Authorities, with British Engineering firms and with the Central Electricity Authority, is also becoming increasingly important. These responsibilities are handled by a small staff of physicists, chemists and administrative staff, who make up the Technical Policy Branch.

Operations

This branch is responsible for the operation of the Authority's works at Springfields, Capenhurst, Windscale, Calder Hall, Dounreay and Chapelcross. Whilst most of the work of this branch is carried out at these establishments, a headquarters group at Risley co-ordinate policy for the works and examine the general problems of production, economy of processes and suitability of proposed new methods. In the production establishments the responsibilities of professional staff are concerned not only with the technical complexities of production, but also with the management of large groups of skilled and semi-skilled workers. The works provide excellent experience for those who wish to follow a career in the industrial management field. The types of plant to be managed include reactors and chemical plants of an increasing variety, and show considerable novelty in their design and operational control.

Research and Development

The Headquarters of the Industrial Group Research and Development Branch is at Risley, but the majority of the Research and Development staff are employed in the laboratories attached to the works at Springfields, Capenhurst, Windscale and Dounreay.

In addition, there is a laboratory at Culcheth, near Risley, which is not on a factory site.

The Research and Development Branch is responsible for providing information for the design offices, carrying out research work aimed at improving efficiency of plant operation, considering and testing the feasibility of proposed new types of process or plant, and for certain fundamental research work.

In the Research and Development Branch there are several hundred professional, scientific and experimental officers, and a large supporting staff. There is ample scope for those looking for unusual and stimulating work in the fields of chemistry, physics, applied mathematics, metallurgy, engineering or chemical engineering.

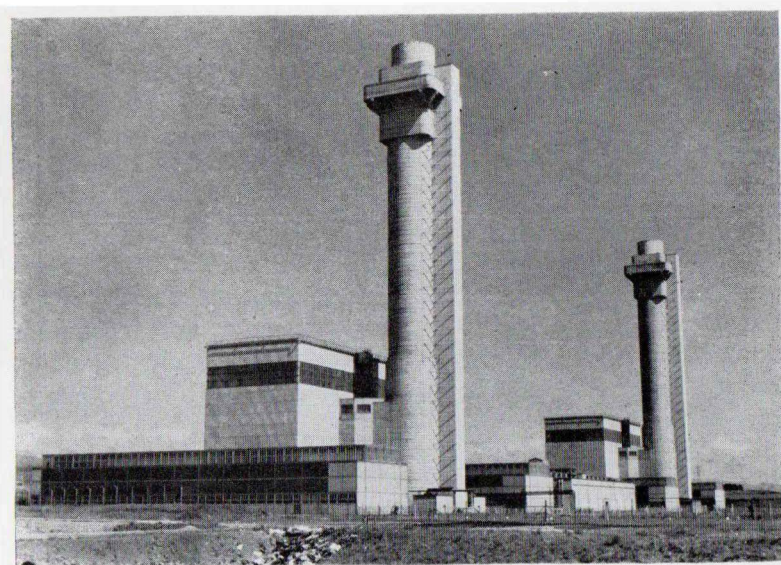
Administration and Personnel

The Administration and Personnel Branch is located at Risley, with small staffs at the works. This branch is responsible for seeing that the administrative machine works smoothly. From recruitment to retirement this branch is concerned with establishment and personnel problems, interpretation of staff regulations, promotions, training schemes, calculations of salaries and wages, payment of travel and subsistence allowances, compilation of staff records and statistics, office accommodation, housing and other welfare arrangements.

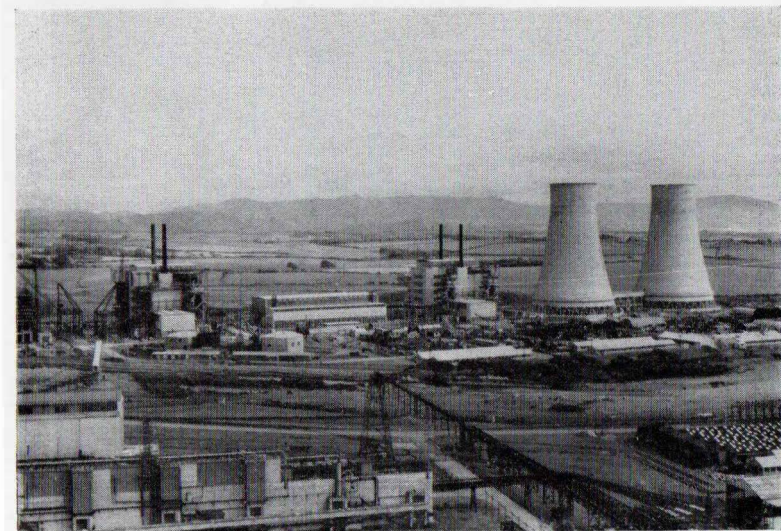
The work is similar to that done in any large industrial organisation, with certain special and interesting problems arising from the rapid expansion of the Industrial Group. There are several grades of executive officers who carry varying degrees of responsibility for organisation and control. There are also a large number of clerical staff trained and experienced in their work, junior staff on routine jobs like filing, and trained secretaries and typists.

Accounts and Stores

The financial control and accountancy services of the Industrial Group are largely centred in Headquarters at Risley. Qualified accountants in the Headquarters' Finance and Accounts Branch, and in some cases at the works and construction sites controlled by the Group, carry out a wide range of industrial accountancy work and have opportunities for developing their knowledge and experience of industrial administration.



General view of the pile buildings at Windscale



View of Calder Hall 'A' from Windscale

The purchasing and stores control organisation of the Industrial Group is centred in the Purchasing and Stores Branch at the Risley Headquarters. A wide range of commercial activities is carried on concerned with negotiation and placing of contracts for building and civil engineering work, the fabrication, supply and erection of plant, machinery and equipment and the purchasing of operational and maintenance materials.

The Establishments of the Industrial Group

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SPRINGFIELDS

This is the only works at present engaged on the production of uranium fuel elements for graphite moderated reactors. It is a chemical engineering factory processing uranium from the ore to pure metal. The present process has been in operation since 1947, but a new process has been developed and a new plant to operate this process is under construction on the same site.

The operating experience gained and the considerable research and development effort have resulted in a more efficient process which will shortly be in operation.

The Research and Development laboratories at Springfields have been mainly engaged in the development of such new processes and in the development of fuel elements for reactors at Windscale, Calder Hall and Dounreay.

WINDSCALE

Since 1951 two large plutonium producing reactors have been in operation and associated with them a fascinating chemical process for the extraction of pure plutonium from irradiated fuel elements. This process, handling highly radioactive irradiated fuel elements, required a unique chemical plant, designed to run with the minimum of maintenance and with the maximum safety for personnel. Plutonium produced at Windscale was used in the first British atomic bomb exploded at Monte Bello, and in subsequent weapons.



A general view of the works administrative building at Capenhurst



Operating Platform — Capenhurst

The analytical laboratories at Windscale, designed for the handling of highly radioactive samples, are of original design and provide excellent facilities for work by scientific staff on analytical problems.

The Research and Development laboratories play a considerable part in the general development of nuclear reactors and allied processes, and have a special interest in the operational and development problems of the Windscale and Calder Hall reactors and the Windscale chemical plants.

CAPENHURST

A large gaseous diffusion plant is engaged on the separation of isotopes of uranium, the latter being in its gaseous compound, uranium hexafluoride. This plant is capable of enriching the uranium 235 content of uranium and thus providing for reactor fuels of any required degree of enrichment. It operates the first stages in the production of enriched fuel for the fast reactor at Dounreay.

The activities of the Research and Development laboratories cover four principal areas of interest—work in response to the needs of the uranium hexafluoride diffusion plant, developments for existing and proposed reactors, investigations into the separation of stable isotopes on an industrial scale, and the study and development of special instruments.

CALDER HALL

A good deal has been published about Britain's first nuclear power station. It suffices here to say that on this site there will be four gas-cooled graphite moderated nuclear reactors for the production of plutonium and power for the national grid.

CHAPELCROSS

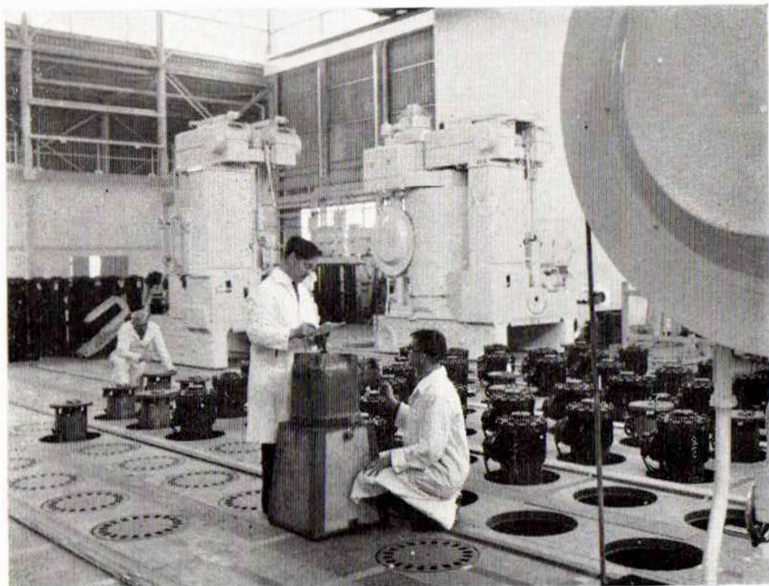
This station is under construction and will have four gas-cooled graphite moderated reactors identical with those at Calder and serving the same purpose. Like Calder Hall, Chapelcross will operate as a plutonium and power producing station. In each case, the chemical separation of plutonium from irradiated fuel elements will be carried out at Windscale.

DOUNREAY

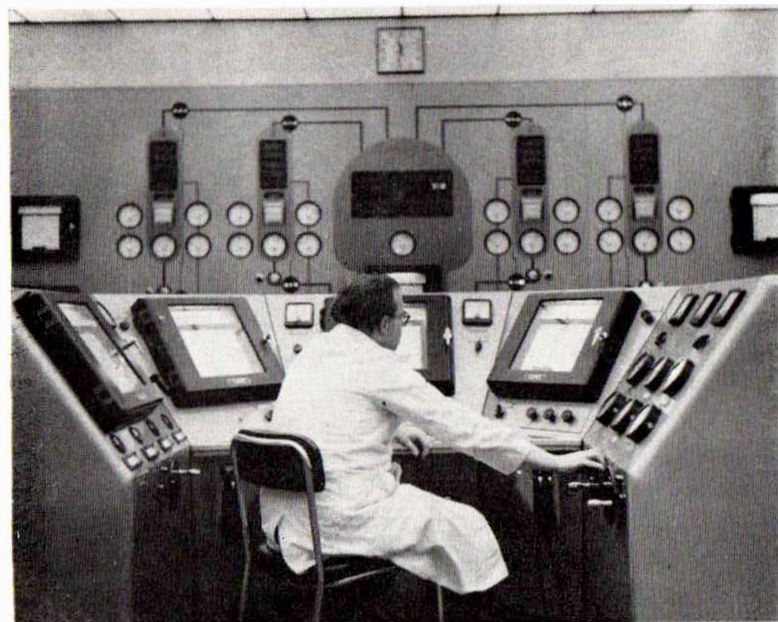
This large experimental station will operate a number of reactors—a materials testing reactor in 1957 and a fast-breeder reactor in 1958. Associated with the reactors is a chemical plant for the final preparation of fuel elements and for the processing of irradiated fuel elements.

Modern analytical laboratories with up-to-date remote handling techniques are devoted to analytical control work for the plants.

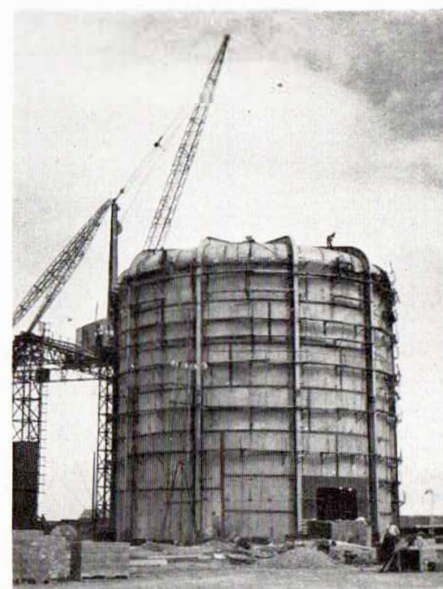
The planning of experimental work and operational research on reactors and chemical plants will be centred in the Research and Development laboratories.



The charge/discharge deck of No. 1 Reactor at Calder Hall



The control panel of No. 1 Calder Hall Reactor



The Materials Testing Reactor at Dounreay

The Recruitment of Graduates

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University graduates, when applying for posts in the Industrial Group, are encouraged to exercise a choice of location and type of work, and considerable effort is made to meet the wishes of successful graduates.

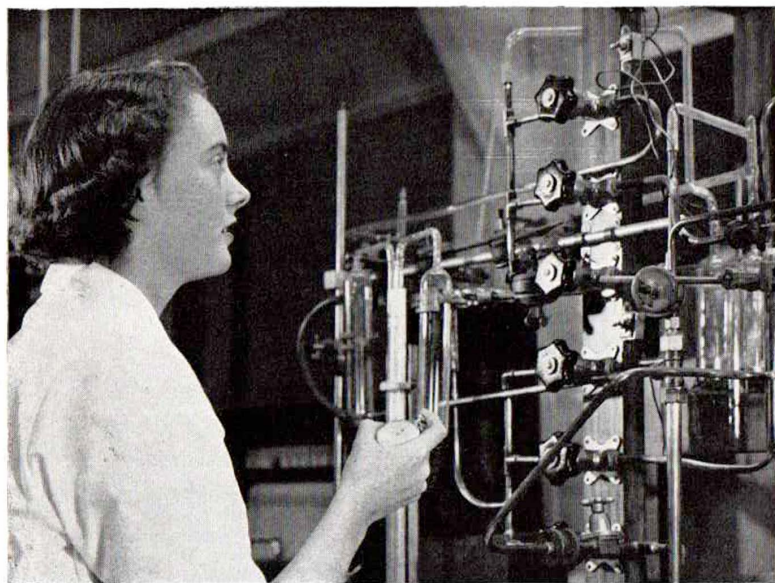
To enter one field of work does not preclude the future transfer of the graduate to other types of work and other locations, both at the request of the individual and at the request of management. The interests of the graduate and the work to be done are constantly borne in mind. It is fully realised that efficiency can be best achieved by those who are happy and interested in the type of work upon which they are engaged.

In general, graduates should have at least a second class honours degree, but there are also opportunities for graduates with pass degrees.

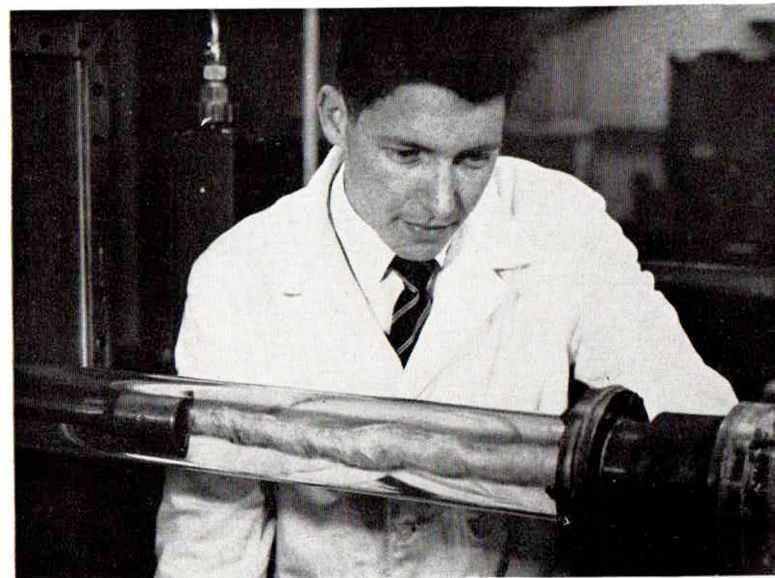
In the following pages, possible careers for graduates in science and engineering are described.

Graduates selected for appointment in the Atomic Energy Authority are offered something more than a job; they are offered a career. Such careers are open to men and women.

Salary structures have been carefully built up to allow measured increases as experience develops, and there are good prospects of promotion for officers suitable for higher duties. The salaries paid to honours graduates are good, and they progress by annual increments. But a man or woman can expect to reap the reward for good work by accelerated promotion to the next higher grade long before he or she has reached the maximum of his or her initial grade.



Measuring the viscosity of boron trifluoride at 100° C.



Hydrodynamic study of the separation of entrained gas from a circulating fluid

Careers for Chemists

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Graduates in chemistry are appointed to undertake work of one of the types listed below. It is generally required that graduates should have pursued inorganic and physical chemistry as their main subject. The scope for pure organic chemistry is limited.

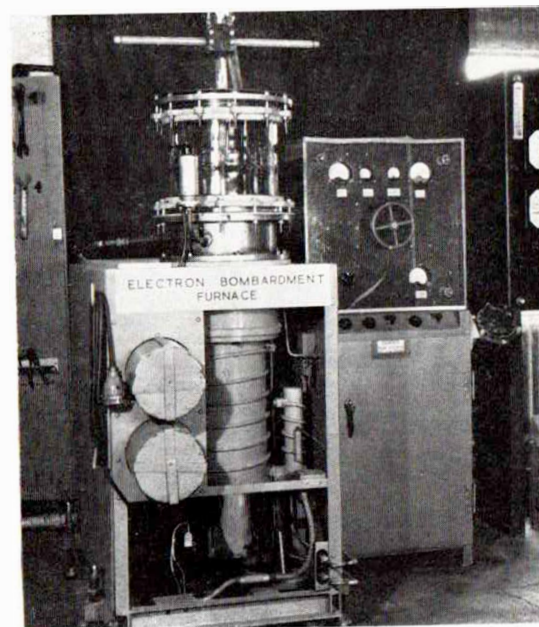
Professional or Plant Chemists

The work generally involves the operation of chemical production plants or pilot and experimental plants. It combines technical control with management of operating staff, both factors being important to the success of the work. A career in plant management is a satisfying one, with ample scope for promotion to those who show the right personal qualities required for leadership of an industrial working team.

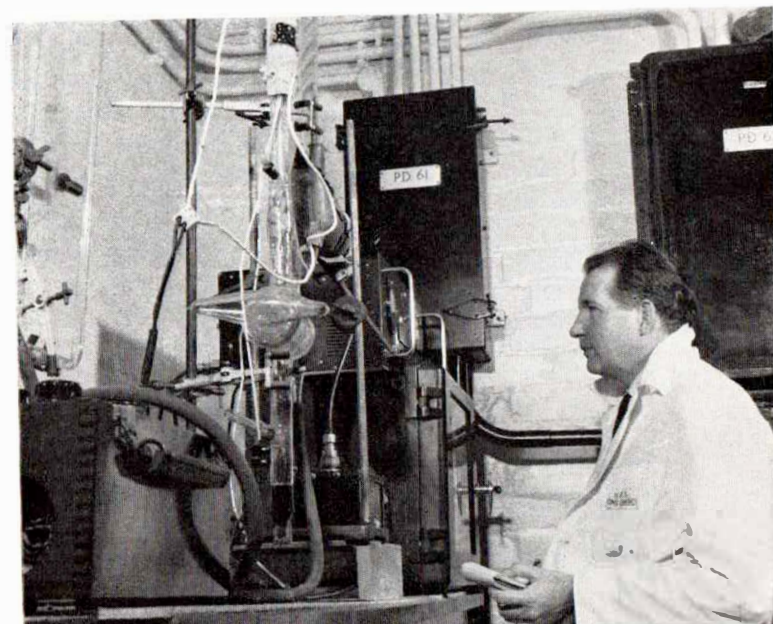
During the first twelve to eighteen months after appointment, young chemistry graduates receive training in the work under experienced staff. For the early part of their training their responsibilities cover mainly technical problems of operation. Following this they are gradually given responsibility, under guidance, for the complete control of small sections of plant. The average graduate is capable within eighteen months of assuming the full responsibilities of a plant chemist. Plant chemists are necessarily employed at the factories, mainly at Springfields, Windscale, Capenhurst and Dounreay.

Professional chemists are also employed in the Research and Development Branch, where they assist in the solving of technical plant problems for future plants under design or problems met in the operation of current processes. In the Technical Policy Branch they may be employed in the preparation of programmes for long-term projects.

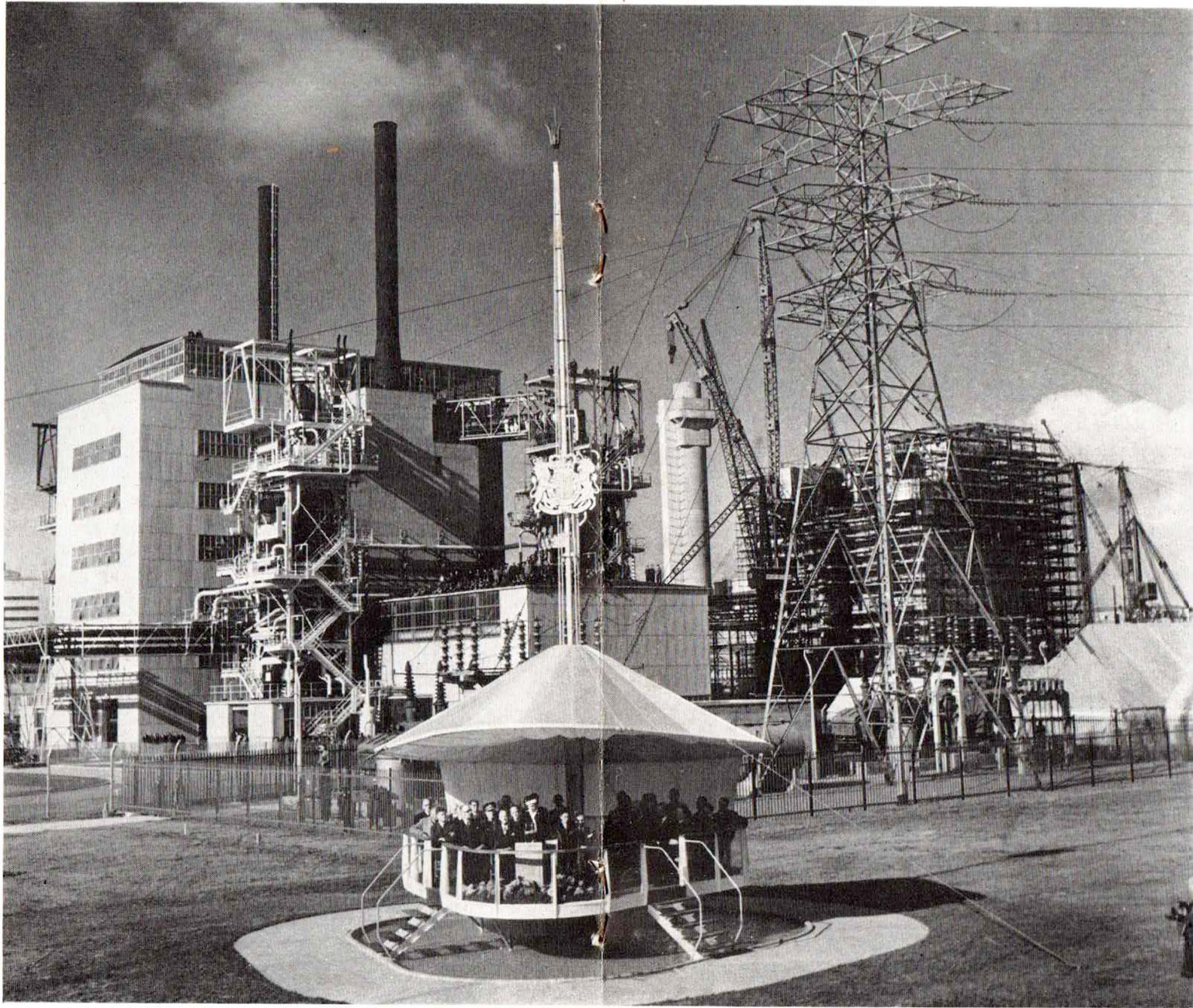
The posts on first appointment are graded as Technical Assistants or Chemists III. The prospects of promotion to Chemist II and Chemist I are good; promotion is open to all staff after a few years practical experience.



Electron bombardment melting unit



Measuring the reaction between carbon dioxide and different types of graphite



The opening of Calder Hall by Her Majesty The Queen on 17th October, 1956

Analytical Chemists

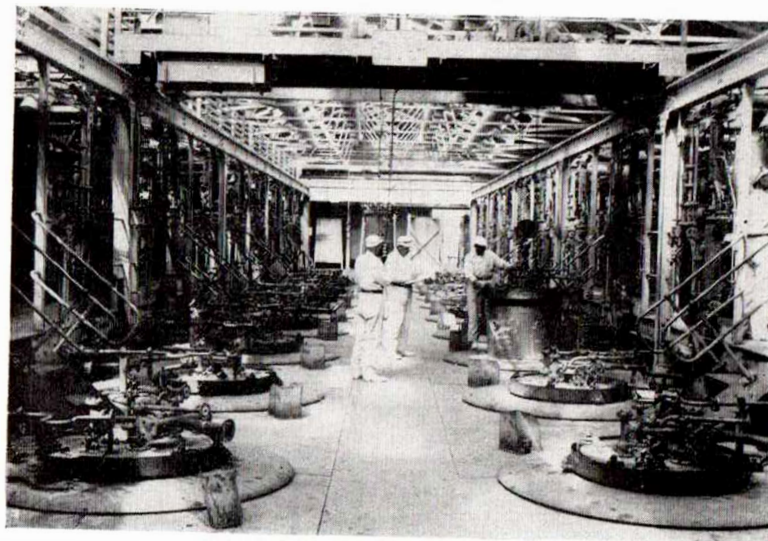
Effective control of chemical plant operation can only be carried out if analyses of raw materials, intermediate and final products, are performed to a very high degree of accuracy. The degree of accuracy required is such as is rarely met with in large-scale chemical production work. For example, all components of the fuel elements prepared for reactors must be of exceptional purity; it must be possible to detect less than one part per million of certain elements in uranium. New methods have been and still are being developed for analysing highly radioactive materials.

At Springfields, Windscale, Capenhurst and Dounreay, new laboratories devoted entirely to analytical work are in operation. The head of the analytical laboratories carries the title of Chief Chemist. He is assisted by teams of scientific staff, each team headed by a Scientific Officer and comprising Experimental Officers and Scientific Assistants.

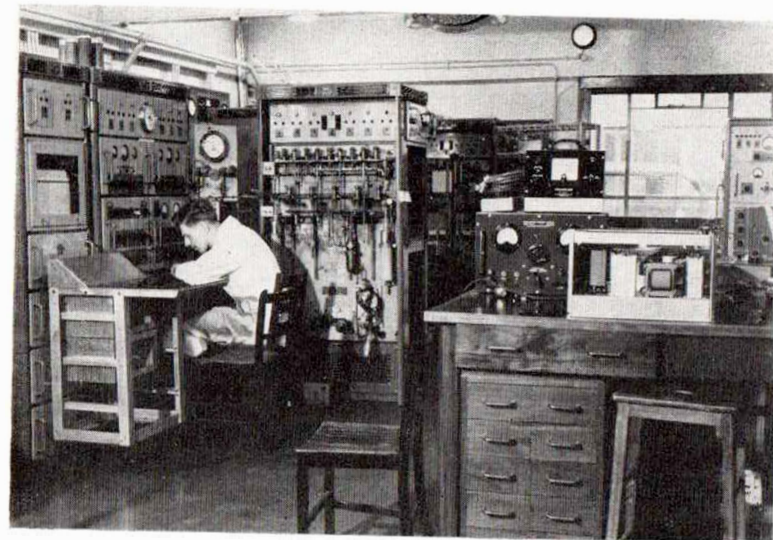
A very wide variety of analytical methods is used; these involve to a large degree the use of modern physical and chemical equipment, including spectrographic apparatus. The work provides enlivening experience for all those who are interested in analytical work. University graduates in chemistry may be appointed as Scientific Officers or Assistant Experimental Officers, according to the quality of their degrees.

Research Chemists

Research Chemists working with teams of other scientists are chiefly engaged in the development of new or improved processes suitable for operating on the industrial scale. With Chemical Engineers, they are engaged on all stages of development of a process from laboratory experiments to the provision of the final flow-sheet and chemical engineering data required for the design and operation of full-scale plant. The work is mainly concerned with the processing of irradiated fuel from present and projected reactors; it involves investigation into the precise properties and compatibility of various materials proposed for reactors and chemical plants.



The Dryway Plant at Springfields



Morso spectrometer laboratory — Capenhurst

Careers for Physicists

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For Physicists, the scope and variety of work available in the Industrial Group is unlimited; it ranges through reactor physics, diffusion-plant theory, health physics, irradiation physics, economic assessment of future projects, and electronics.

Reactor Physicists

Reactor operation provides the opportunity for Physicists to learn not only the theory of reactors but also the management of these new plants, some of which, in the next few years, will be built and operated by the Electricity Authorities of this country. A career in reactor operation will provide ample opportunity for promotion for those people who take full advantage of it. There is opportunity for the application of specialist physics knowledge to the control of reactors, and for learning a great deal about the engineering of reactors. The future for reactor control physicists is promising. As already indicated, graphite moderated piles have now been built and operated: new types of reactors are being built and others are in the design study stage.

The ambitious fast fission reactor at Dounreay, which may well be the reactor of the future, is in an advanced stage of construction. It is a reactor which not only releases enormous quantities of energy, but will breed more fuel than it consumes. Also under construction at Dounreay is another reactor — a materials testing reactor. This is a heavy water moderated reactor with a high neutron flux which will be used for assessing the effect of intense neutron radiation on various materials which may be used for construction in future reactors.

Health Physicists

The importance of health physics can readily be realised. Its importance is growing every day with the increasing use of radioactive materials in industry. The Health Physicist has a responsible job: it is that of detecting and measuring radiation wherever it may occur, and assessing the degree of protection necessary for workers who might become exposed to it. It is the Health Physicist's responsibility to advise the factory management on the steps which should be taken to protect workers and plant.

A physicist who begins his industrial life in a Health Physics Department has an excellent opportunity of seeing a wide variety of work because his responsibilities would take him to every single section of the Works. He would meet staff at all levels and his advice would be sought in a variety of unusual circumstances.

Diffusion Plant Physicists

Although the diffusion plant at Capenhurst is an engineering plant, its control and efficiency depends upon physicists who can carry out calculations necessary for assessing through-puts, degree of enrichment and the like. Physicists here are again responsible for advising engineers on the control necessary to achieve the desired quality of product. Physicists have an equal opportunity with engineers for full managerial responsibility of the diffusion plants.

Electronic Instrumentation

A small number of physicists are engaged in electronic work. The development of analogue methods of solving reactor problems is receiving increasing attention, as well as improved methods for the detection and precise measurement of radioactivity, and other physical factors.

Physicists undertaking work in one of the above fields may be employed in the Operations, Research and Development or Technical Policy Branches either at Risley Headquarters or in the works and laboratories: they should find congenial work in any of the branches. The opportunities of promotion for physicists are excellent.

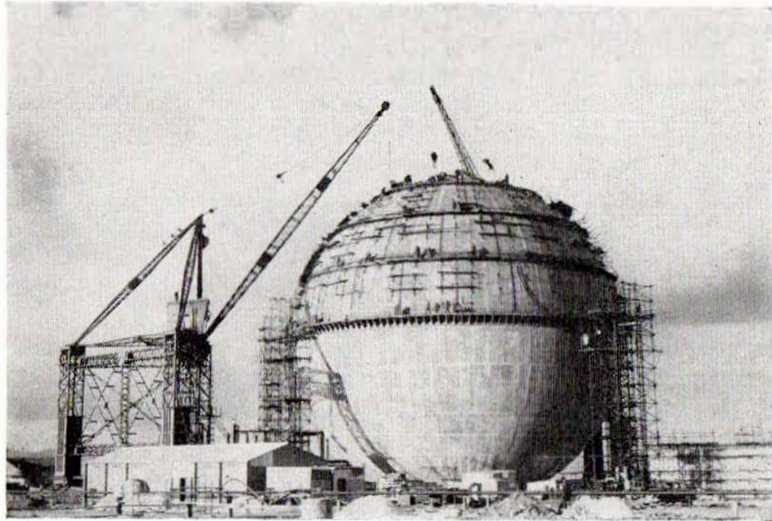
Careers for Engineers

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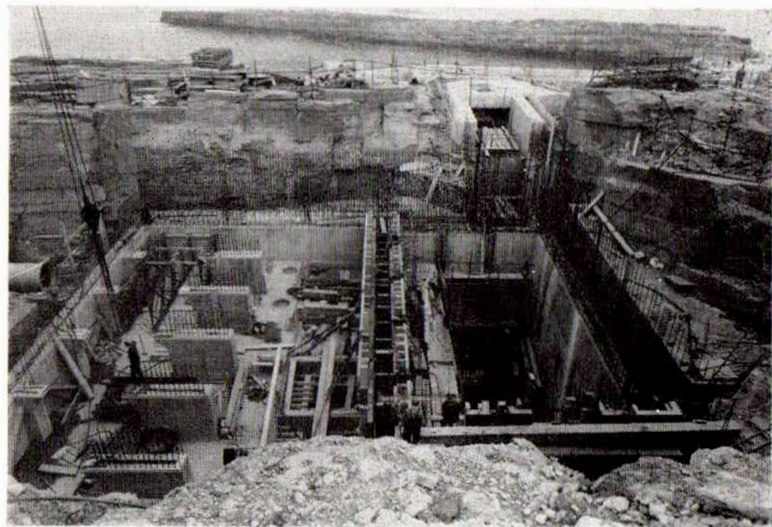
In general, graduate engineers are required to have served an apprenticeship or show that they have practical experience approximately equivalent to that of an apprenticeship. However, there are vacancies each year for Graduate Apprenticeship, particularly for training for design work. See p.28.

Design Engineers

The design engineer occupies a key position during the design and construction of any reactor or chemical plant. He is responsible for detailed plant design, and for maintaining overall control of his part of a job right through to completion. It is work that is, as a consequence, extremely interesting and a satisfying career for junior as well as senior members of the staff.



The Fast Reactor at Dounreay



Sea-water pump house at Dounreay

It should not be difficult to appreciate the achievements of design engineers in the work of the Atomic Energy Authority. Starting with B.E.P.O., the experimental pile at Harwell, the Risley design engineers have designed and followed through to completion four factories ; two others are under construction. Each of these provided entirely new problems. The design engineer must be capable of conceiving new ideas and welding together unorthodox and orthodox engineering concepts and practice.

The Risley engineers were responsible for the design of the plutonium producing reactors at Windscale, the power reactors at Calder and Chapelcross, and the fast reactor at Dounreay. Design studies are proceeding on new reactors for civil use ; these reactors, when the ideas come to fruition, will be built by the Authority.

The essential personal qualities of a design engineer in the Authority are imagination, initiative and ability to lead a team. He must be capable of assessing the significance of the large number of factors affecting the choice of design, siting, construction and operation of new plants, and of arriving at an optimum solution ; he is required to discuss with scientists the technical problems arising at each stage. Honours graduates in engineering, who have had practical experience at least equivalent to an apprenticeship, will find in design work the utmost satisfaction in seeing their ideas eventually take shape.

To those graduates who have not served an apprenticeship, the Industrial Group offers training as Graduate Apprentices.

Research and Development Engineers

In the Research and Development laboratories, engineers are called upon to design, erect, and operate experimental rigs for testing special equipment and assessing unusual conditions to assist design engineers in solving new problems. Experimental engineering is conducted mainly at Capenhurst, Windscale and Dounreay.

Works Engineers

Each of the works employs a large number of engineers specialising mainly in mechanical, electrical or instrument engineering. The work they are called upon to do falls into two classes : (1) management of production plants — reactors, diffusion plants or power production ; (2) management of sections concerned with the maintenance of all equipment in a factory. In the first case a formal apprenticeship may often be unnecessary though still an advantage ; in the second case an apprenticeship is essential.

The engineering equipment which has to be operated or maintained is largely conventional but includes many novel items designed specially for atomic energy plants; in particular the operation of plants handling highly radioactive materials calls for thousands of instruments, many of entirely new concept and design.

Maintenance engineers are frequently called upon to undertake the smaller construction tasks where considerable modifications to an existing plant are required.

Engineers may be appointed to the works either as Technical Assistants (if experience is limited) or as Engineers III. Prospects of promotion are good for those showing the considerable initiative and adaptability required for the work.

Construction Engineers

The Construction Branch of the Authority is responsible for carrying out all new construction work of the Industrial Group, comprising large-scale civil, mechanical and electrical engineering projects, on several large sites in various parts of the country. This work is very interesting, often unique in the engineering field, and the most up-to-date methods are employed.

Graduates who have served an apprenticeship in engineering are offered a rewarding career and will enter on a professional engineering grade of at least Engineer III level. The experience then given is carefully planned to enable them to carry out work of increasing responsibility and thus facilitate their promotion, on merit, to more senior grades.

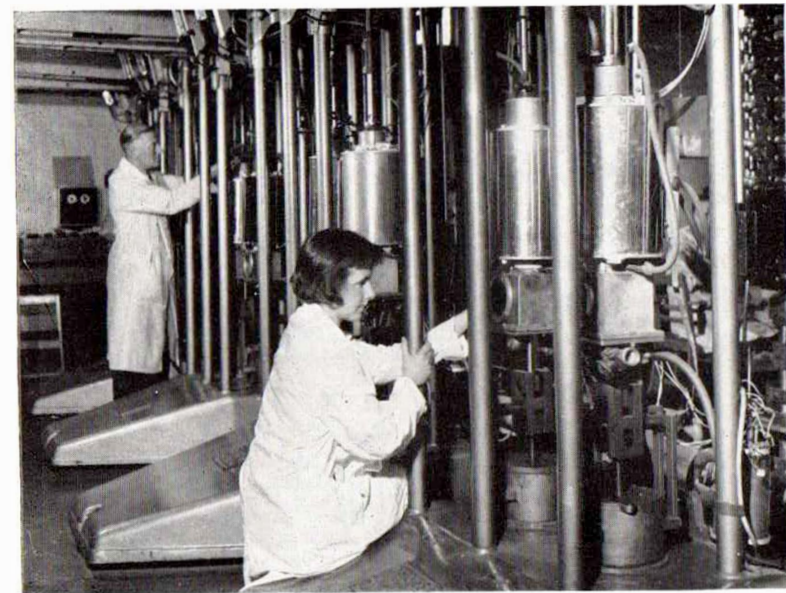
The work gives the necessary experience to enable graduates to become Corporate Members of one or more of the leading professional bodies, e.g. the Institutions of Civil, Mechanical or Electrical Engineers.

Chemical Engineers

Chemical engineers find their most satisfying work in chemical plant design and in pilot-plant development work. They may be employed in particular work not directly connected with chemical plant where their specialised knowledge is of value. Fuel element design and heat transfer work are examples. Some of the advanced types of reactor now under consideration, in which the fuel is in the form of a solution or slurry, will require considerable chemical engineering knowledge in their design. Thus chemical engineers may be posted either to the Engineering Branch or to the Research and Development Branch, and, exceptionally, to the Operations Branch.



A Springfields laboratory assistant polishing specimens of can materials for microscopic examination



Determining the creep strengths of fuel materials at Culcheth

Graduate Apprenticeship

Graduate Apprenticeship is open to graduates who have taken an honours degree in engineering. Training is normally for two years. The first year is spent in a large industrial firm, the second year is spent in the establishments of the Industrial Group. The range of training is wide and includes work on the shop floor, in design offices and attached to construction groups. In the later stages of training, apprentices are given supervisory responsibilities for sections of work under the direction of senior engineers. The practical training is recognised as meeting the requirements of the Professional Engineering Institutions.

On completion of training, graduate apprentices are available for appointment as Assistant Design Engineers or Technical Assistants, with excellent prospects of promotion. Details of salary, leave etc. are given in the Appendix.

Careers for Metallurgists

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Metallurgists are mainly employed in the Research and Development laboratories at Culcheth, Springfields, Dounreay and Windscale. There are only a few posts for metallurgists in the Operations Branch where they would be engaged on metallurgical production processes for fuel elements.

The investigation of metallurgical problems of the Industrial Group covers an extremely wide field — from ferrous to non-ferrous materials including the refractory metals vanadium, titanium, zirconium, niobium, tantalum, molybdenum and tungsten. The Culcheth laboratories, in particular, are equipped with all the tools required for modern metallurgical research. The main responsibility of Culcheth is the selection of reactor materials: this includes work on the extraction of materials where they may not be commercially available, the compatibility of materials with fuel cans and coolants and the physical and mechanical properties of selected materials.

The materials testing reactor at Dounreay may be regarded as a metallurgical tool and metallurgists, together with physicists and chemists, will be concerned with an assessment of the effect of high neutron irradiation on materials proposed for reactors.

Graduates are eligible for appointment either as Scientific Officers, Assistant Experimental Officers, or Professional Metallurgists.

Grades, Salary Scales and Career Prospects

SCIENTIFIC OFFICER CLASS

Qualifications

The minimum qualification is a second class honours degree in an appropriate subject. In certain circumstances, however, an alternative professional qualification (e.g. Associate of the Royal Institute of Chemistry) may be accepted.

Candidates without previous research experience, or with limited experience, are appointed to the grade of Scientific Officer. Suitable candidates, normally over twenty-six years of age, who have had at least three years post-graduate research experience may be appointed to the grade of Senior Scientific Officer. Appointment to the grade of Principal Scientific Officer is dependent upon further research experience.

Candidates who are in the process of obtaining a suitable qualification may be considered, and, if successful, any offer of appointment made by the Authority will be conditional on obtaining that qualification.

Prospects of Promotion

Promotion from the basic grade of Scientific Officer to Senior Scientific Officer and thence to Principal Scientific Officer depends on the merit and ability of the officer appointed. There are also prospects for advancement beyond the Principal Scientific Officer Grade for those with outstanding ability.

Salary

The starting salary as a Scientific Officer depends upon age and research experience, and consideration is also given to approved periods of National Service. The salary ranges are :—

Scientific Officer :	£615 rising by annual increments of approximately £30 to £1.065 per annum.
Senior Scientific Officer :	£1.155 rising by annual increments of approximately £40 to £1.355 per annum.
Principal Scientific Officer :	£1.390 rising by annual increments of approximately £60 to £1.980 per annum.

PROFESSIONAL ENGINEERS, CHEMISTS, CHEMICAL ENGINEERS, PHYSICISTS AND METALLURGISTS

Qualifications

ENGINEERS : A recognised engineering apprenticeship and corporate membership of a senior engineering institution, e.g. Associate Member of the Institution of Civil Engineers, Associate Member of the Institution of Mechanical Engineers, Associate Member of the Institution of Electrical Engineers, is essential, but candidates for the basic grade may be considered if they have exemption from Sections A and B, provided they undertake to obtain exemption from Section C.

CHEMISTS,
METALLURGISTS
AND PHYSICISTS : (a) An honours degree in Chemistry, Metallurgy, Physics, Chemical Engineering, or Engineering.

or

(b) Associate of the Royal Institute of Chemistry, Associate of the Institution of Metallurgists, Associate of the Institute of Physics, or Associate Member of the Institution of Chemical Engineers, is essential.

Candidates who are in the process of obtaining a suitable qualification may be considered, and any offer of appointment made by the Authority will be conditional on obtaining that qualification.

Prospects of Promotion

In an expanding organisation vacancies occur frequently and there are good prospects of promotion from the basic grade to the senior grades.

Salary

Graduates may be appointed initially as Technical Assistants or in the basic grade (Grade III) according to experience.

The starting salary in the Technical Assistant and basic grade (Grade III) is assessed according to age up to the age of thirty-four : from that point it progresses by annual increments to the maximum of the scale. At age twenty-one it is £565, at twenty-five £775, at thirty £920 and at thirty-four £1,060. The annual salary ranges for the three grades are :—

Technical Assistant	£565 to £920 per annum.
Grade III	£565 rising by annual increments of approximately £35 to £1,210 per annum.
Grade II	£1,235 rising by annual increments of approximately £50 to £1,655 per annum.
Grade I	£1,705 rising by annual increments of approximately £80 to £1,980 per annum.

The Technical Assistant grade is an introductory grade for those who have limited industrial experience. Technical Assistants normally move into the basic grade within approximately two years.

EXPERIMENTAL OFFICER CLASS

This class does theoretical and practical work requiring the application of established scientific principles. It provides assistance on scientific research, design and development work and assists in any investigations, particularly in the detail of their execution, under the general guidance and direction of the Scientific Officer Class. A few officers in this class are employed as Technical Librarians and on technical information duties, and also in the Technical Administration and Planning Section.

Qualifications

The minimum qualification is a Higher School Certificate with Mathematics or a Science subject as principal subject, or a General Certificate of Education in five subjects at the levels shown ; (a) English Language (Ordinary) ; (b) two Mathematical or Scientific subjects (Advanced) ; (c) Mathematics (Ordinary) if no mathematical subject is offered at (b) ; (d) a Scientific subject (Ordinary) if no Scientific subject is offered at (b) ; (e) balance of one or two subjects (Ordinary) at candidate's choice.

A University pass degree in science, mathematics, or branch of engineering, or membership of one of the professional institutions (e.g. Associate of the Royal Institute of Chemistry, Associate of the Institution of Metallurgists, Associate Member of the Institution of Mechanical Engineers), or a Higher National Certificate, etc. is an advantage.

In exceptional cases specialist practical experience in a particular field may be accepted in lieu of academic qualifications.

First appointment is made in the grade of Assistant Experimental Officer. The minimum age for the grade of Experimental Officer is normally twenty-six years, whilst for Senior Experimental Officer it is normally thirty-five years.

Candidates who are in the process of obtaining a suitable qualification may be considered and any offer of appointment made by the Authority will be conditional on obtaining that qualification.

Prospects of Promotion

Promotion from the basic grade of Assistant Experimental Officer to Experimental Officer and thence to Senior Experimental Officer depends on the merits and ability of the officer appointed. In addition, for those acquiring suitable qualifications, there are prospects of promotion to the Scientific Officer Class.

Salary

The starting salary for Assistant Experimental Officers is linked to age eighteen and is assessed on an age scale up to twenty-six years, from that point it progresses by annual increments to the maximum of the scale. At age eighteen the salary is £375, at twenty-one £495, at twenty-six £665. The annual salary ranges for the three grades of the Experimental Officer Class are :—

Assistant	£375 rising by annual increments of
Experimental Officer :	approximately £40 to £815 per annum.
Experimental Officer :	£940 rising by annual increments of
	approximately £40 to £1,155 per annum.
Senior	£1,295 rising by annual increments of
Experimental Officer :	approximately £50 to £1,550 per annum.

ASSISTANT DESIGN ENGINEERS

Qualifications

Applicants must have served a recognised engineering apprenticeship, hold at least the Higher National Certificate in Mechanical or Electrical Engineering and have had good Drawing Office and Industrial experience in the duties involved.

Candidates who have a recognised engineering Honours Degree and an aptitude for design and work in a drawing office are not required to have completed an apprenticeship, but applicants should have approximately two years' practical experience and be under twenty-six years of age.

Salary

£795 at age twenty-five rising by annual increments of approximately £30 to £940 per annum, then, subject to proficiency, by further annual increments of approximately £40 to the maximum of £1,210.

Entrants under the age of twenty-five will enter at a lower salary than £795.

Prospects

Opportunities for promotion to Design Engineer II grade are good. The salary range for this grade is £1,235 rising by annual increments of approximately £50 to £1,655 per annum.

GRADUATE APPRENTICES

Qualifications

First or second class honours degree in Engineering or Chemical Engineering.

Salary

Assessed in the range £525 to £640 per annum.

Prospects

On completion of apprenticeship, graduates are eligible for posts as Assistant Design Engineers and Technical Assistants.

GENERAL CONDITIONS OF SERVICE

Accommodation Single accommodation is available at staff clubs at most Establishments. There are Housing Schemes at all Establishments. Houses and flats are let to married officers who live beyond daily travelling distance, according to availability and need.

New entrants who qualify to be housed by the Authority, but decide to buy houses of their own choice within daily travelling distance of their work, may be reimbursed 85% of the legal expenses incurred in such purchase up to a limit of £125.

Removal Expenses

A new entrant to the Authority's service, if married, may be granted, irrespective of location, an advance of up to £100 to meet removal expenses. The advance will be recovered, over a period not exceeding twelve months, by deductions from salary. Additional assistance can be given in respect of removals to Dounreay.

Superannuation

The Authority has a very attractive Contributory Superannuation Scheme for which the employees' contribution is 6% of salary. The normal retiring age is sixty-five.

Leave and Sick Pay

The annual leave allowances are generous, falling between three and six weeks per year according to grade and length of service. Public holidays are granted in addition. Staff are normally paid for absences due to certified periods of sickness.

Training

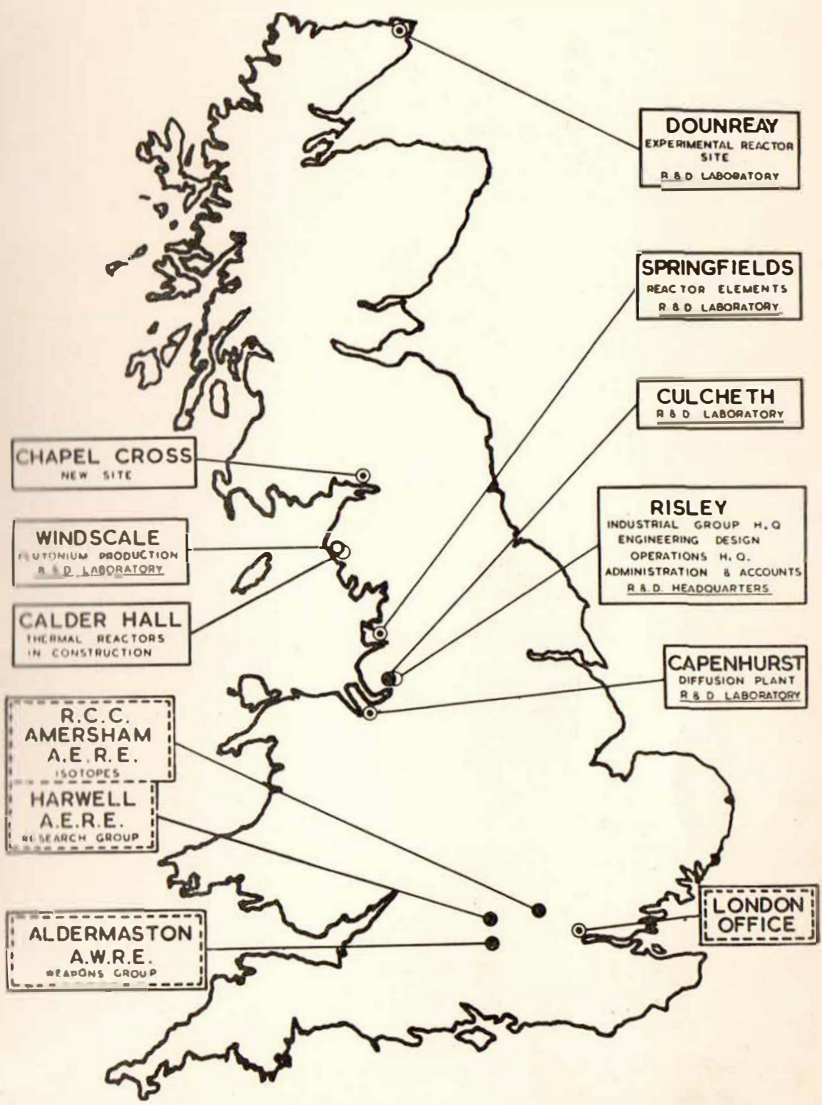
Generous training facilities, both external and internal, are available to most grades. Attendance at appropriate courses and conferences is encouraged.

Medical Service

At all Works there is a comprehensive medical service, including consultation and treatment, staffed by full time medical, nursing and ancillary staff.

Salaries for Women

All salary figures quoted are for men, those for women being generally somewhat lower. However, Equal Pay for Women is being introduced by seven equal annual instalments and will be fully operative by January 1961.



The location of the Establishments

McCORQUODALE
NEWTON-LE-WILLOWS
LANCASHIRE
