Marconi Training

APPRENTICESHIP OPPORTUNITIES
WITH THE FIRST WIRELESS MANUFACTURERS
IN THE WORLD

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ALLIED COMPANIES

The English Electric Company Limited
Marconi Instruments Limited
D. Napier & Son Limited

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED
Education Department
Marconi College, Arbour Lane, Chelmsford, England
Telephone: Chelmsford 4401

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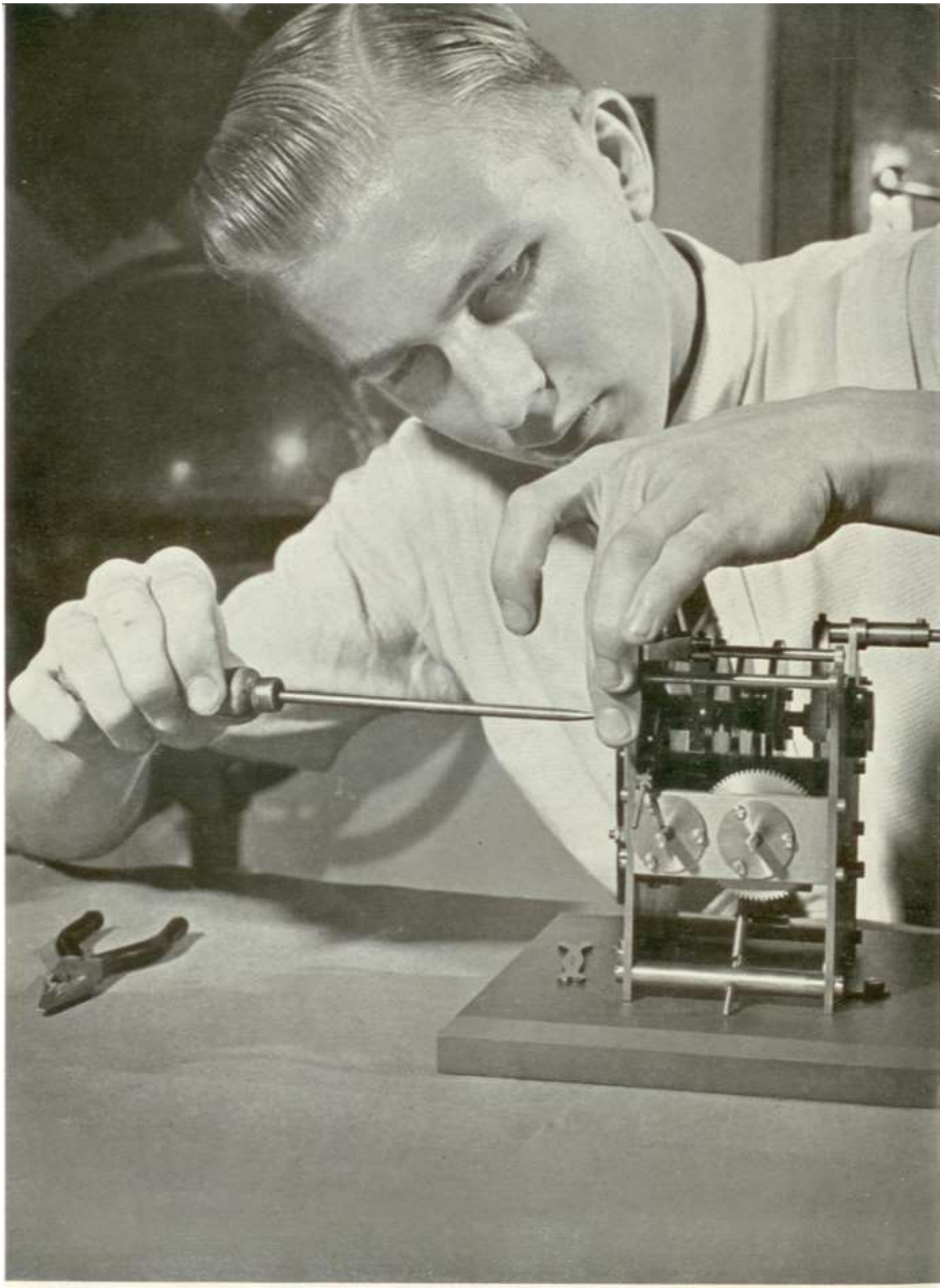


Co-ordination of mind and hand: a MARCONI *apprentice working on his exhibit for the Physical Society's Craftmanship Competition.*

I. INTRODUCTION

The title of this book is purposely simple—"MARCONI TRAINING." The reason is not far to seek. MARCONI training is the oldest established in the wireless industry. The Company was the world pioneer of the new science of communication by electro-magnetic waves.

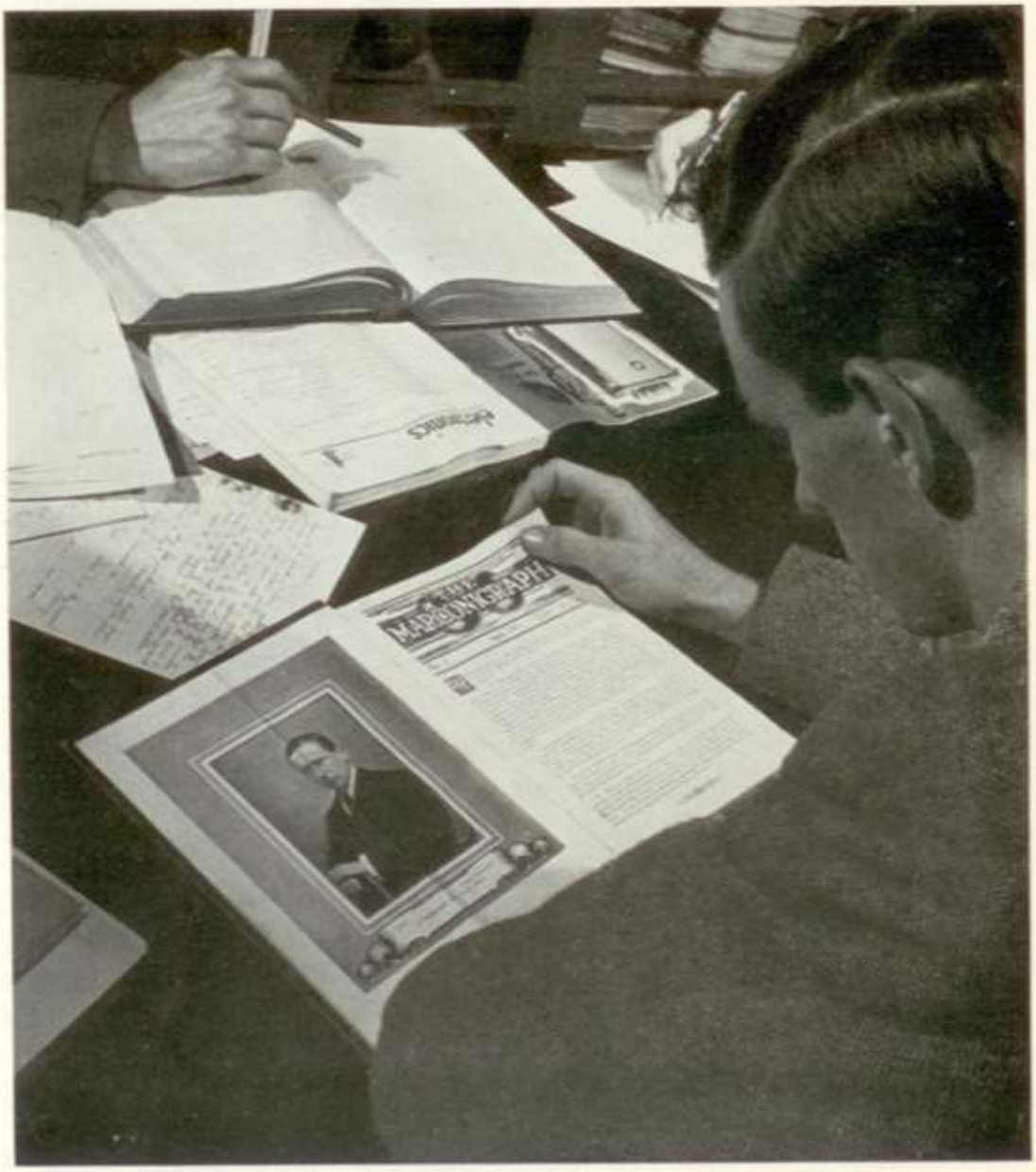
It would be hard to imagine a more telling recommendation for anyone thinking of joining a firm than the fact that its name is a household word throughout the inhabited world. This is true of the name MARCONI. It has come to mean in people's minds all that is most modern in wireless and communications—in fact the words MARCONI and wireless have become almost interchangeable everywhere that English is spoken. The Company would not be the extremely human organization it is, if it were not proud of this fact.

It is one thing to found and establish such a reputation and another to maintain it. MARCONI'S have always taken special care in the selection and training of its apprentices. A name which is a household word will not long remain one, if its possessor does not recognize that its future depends on the quality and technical skill of its employees of all grades.

In 1951 the Company celebrates the first fifty years of the operation of its training schemes. The whole period of the history of radio communications is not much longer. This shows how very early in its career the Company realized the importance of people being brought up to MARCONI techniques and MARCONI standards of excellence and inventiveness. Consequently it organized a training system which has become famous, and to-day attracts students from all over the world.

This booklet is intended, like those which have gone before it, to present to young men, who have the range of talents and the kind of mind for which the Company is looking, the facts about MARCONI Apprenticeship Schemes, and to suggest the advantages of serving their apprenticeship with MARCONI'S.

It is hoped also that much of what is written here will be of interest to parents and teachers, during many of whose lifetimes wireless communication first became news, and who will remember in their childhood, its early thrills, which were identified with one name—MARCONI.



Reading in the Marconi College library—the paper is copy No. 1 of the "Marconigraph," first radio paper in the world.

At Writtle, on the site of the first broadcasting station in Great Britain, the latest type of aircraft transmitter is now being developed.

Dexterity and delicacy of touch demonstrated by the hands of a MARCONI *instrument maker.*

II. HISTORY AND ACTIVITIES

The history of Marconi's Wireless Telegraph Company is the manufacturing history of an invention which changed the manner of thinking of the whole world. To-day, when the voice of a statesman in the United States is heard by listeners in this country we no longer think it remarkable. The idea which produced this great change in people's minds was Guglielmo Marconi's. The organization which first made the world-wide application of it possible by reducing it to a manufacturing process was Marconi's Wireless Telegraph Company.

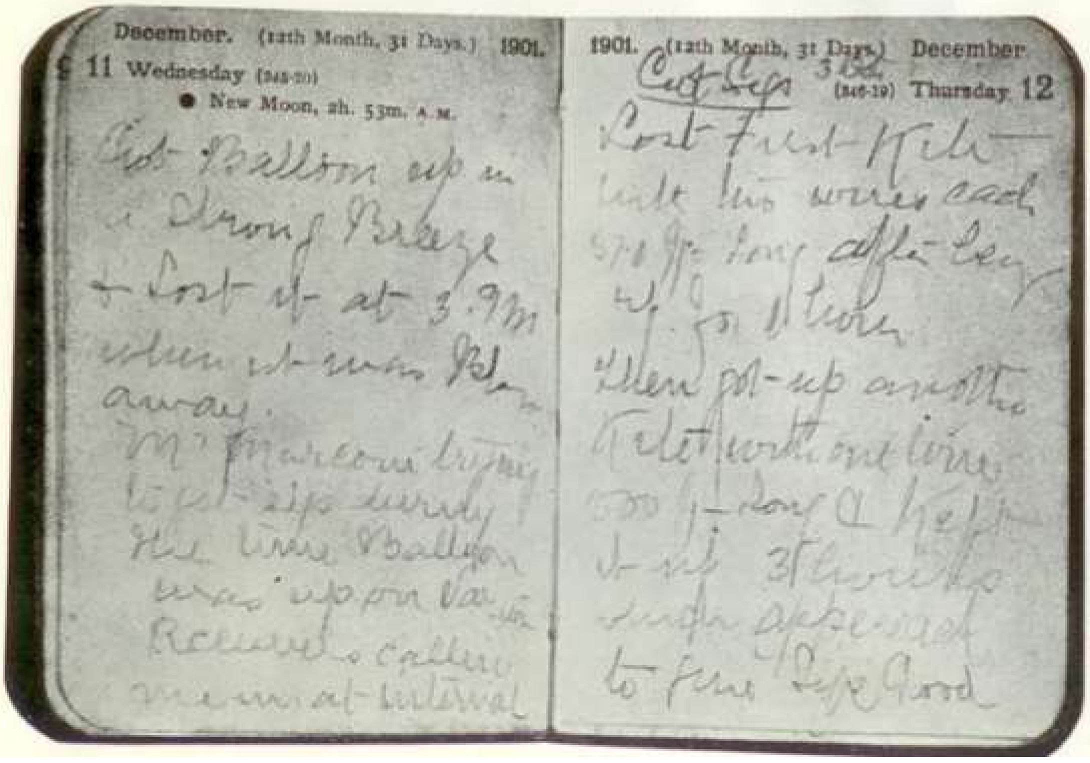
It was MARCONI'S which opened the first radio factory in the world at Chelmsford in January, 1899. From the beginning the Company developed its own wireless apparatus bringing it to the commercial stage by the efforts of its own research and design staff. These principles are still followed to-day. The first factory started production less than four years after the lodging of the original British patent for wireless telegraphy by the 22-year-old MARCONI.

Many of the earliest applications of wireless telegraphy were to ships at sea, and April, 1900, saw the formation of the Marconi International Marine Communication Co. Ltd. Nearly two years later, on December 12th and 13th, 1901, the Atlantic was spanned for the first time by wireless. The now famous "S" signal was transmitted from Poldhu in Cornwall on equipment made at the Chelmsford factory, and heard 1,800 miles away in St. Johns, Newfoundland.

By December, 1902, the first complete messages were being transmitted across the Atlantic. In July, 1903, the MARCONI system was adopted for general use in the Royal Navy. In January, 1905, wireless messages for ships at sea were accepted for the first time at Post Offices in Great Britain, and in 1907 a public transmission service was inaugurated. These were early historic milestones.

By 1906 the world-wide demand for MARCONI apparatus had so increased that a larger and more modern factory was opened at Dalston, but in 1908 a return was made to Chelmsford where the

MARCONI *with two of his collaborators, Messrs. Paget and Kemp, at Glace Bay, Newfoundland, at the time of the first transatlantic wireless transmissions. Below, two pages from Kemp's diary for December* 11*th and* 12*th*, 1901, *noting the reception of the first transatlantic wireless signals.*



original works were enlarged to handle the growing volume of business. By 1911 this site had finally become too small, and the New Street factory was opened in 1912. It is this factory which has remained the parent works of the Group. Marconi House was built in Chelmsford in 1938 as the Company's head office, for the management and administrative staff. Marconi's Wireless Telegraph Company joined the ENGLISH ELECTRIC Group of Companies in 1946.

The MARCONI factory at Chelmsford is one of the historic buildings of the world in the story of wireless. It is associated with the earliest British experiments in broadcasting.

The first regular broadcasts in this country were carried out by the MARCONI Company from Chelmsford. Two 450-feet tubular steel masts, which were erected in the work's grounds, served as landmarks for miles around, until they were dismantled in 1935. These aerials were used during the first world war by the Admiralty to communicate with the Grand Fleet, and later on to transmit programmes from the high-power experimental broadcasting station 5XX which was housed in the works and operated by the MARCONI Company for the B.B.C. in the days when the majority of radio listeners were still hearing their

A modern radio room on board ship shows vividly the compact elegance of MARCONI *marine equipment.*

An apprentice at work on an airfield control radar prototype at the Marconi Research Laboratories at Great Baddow

programmes on crystal sets. Later still, experimental broadcasts to the Empire on short waves were operated from the works for the B.B.C. under the station call-sign 5SW. It was from a specially constructed studio in the Test Department at Chelmsford in a building now known as Mobile Test that Dame Nellie Melba, the great Australian singer, made a historic broadcast on June 15th, 1920, which the *Wireless World* described in these words:

"*Not so very long ago speech by wireless was a thing which men were striving after in the laboratory. Now we have a famous prima donna singing into the microphone—not into the receiver, as a contemporary put it—of a high-power wireless telephone installation by means of which her voice is flung on the ether to hundreds of listeners scattered over Europe and the seas.*"

Marconi's Wireless Telegraph Company provides a unique field for research workers. In the early days, research work was divided between a number of units operating at convenient centres in England and abroad, but in 1939 these centres were combined in the MARCONI Research Laboratories at Great Baddow, three miles from Chelmsford. They are among the most up-to-date in the world, and cover an area of 46 acres, including laboratories, offices and experimental

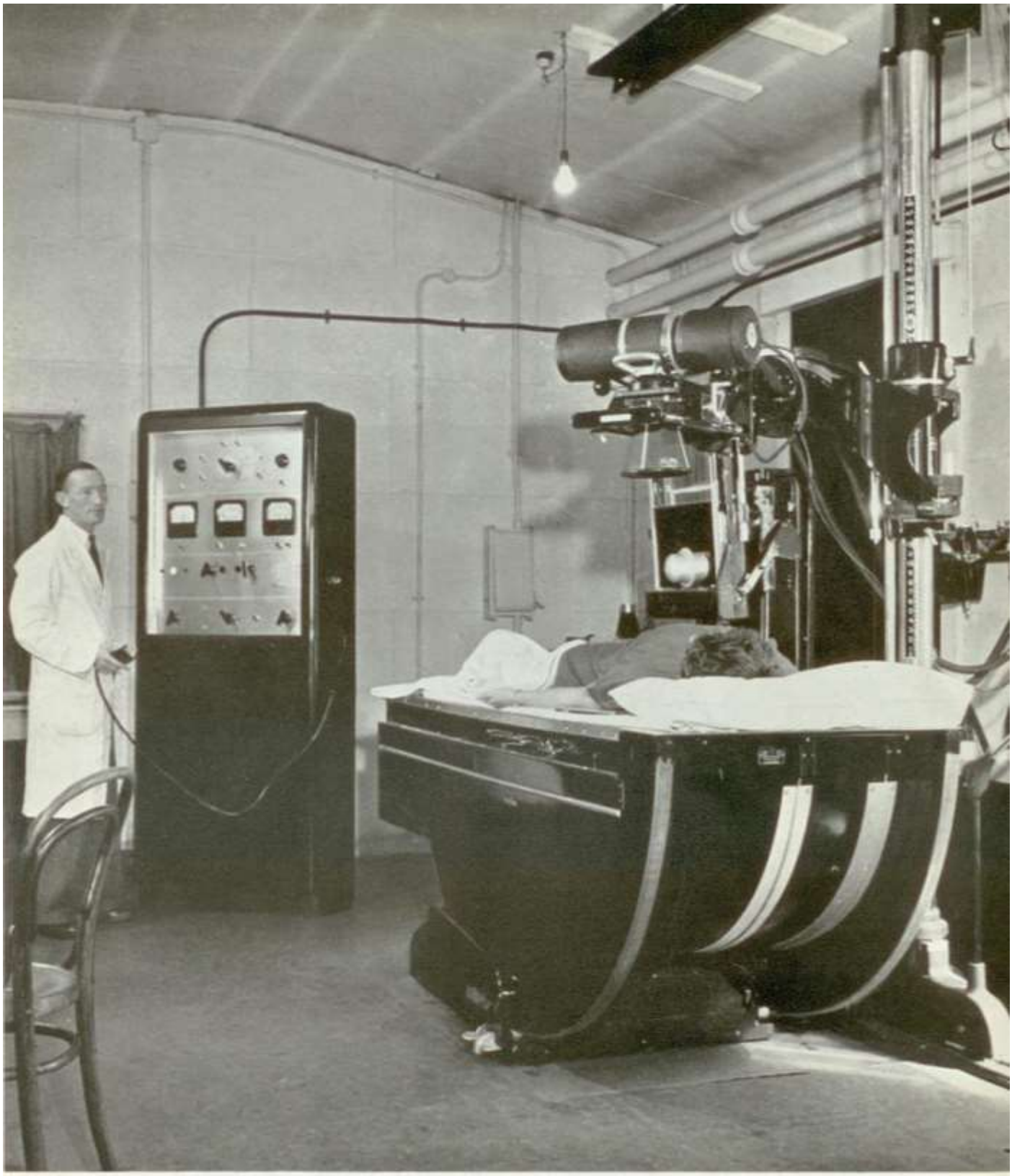
The precision frequency laboratory at Great Baddow, which has among its equipment an instrument capable of checking astronomic time measurements.

The first boat race to be televised from start to finish reached you thanks to MARCONI *television cameras and equipment.*

workshops where new ideas in radio are produced. There are also satellite field stations in and around Chelmsford where specialized investigations of various kinds are carried out.

Much of the laboratories' work is of the Applied Research type and is concerned with the techniques of, for example, aerials, V.H.F. and microwave receivers, special V.H.F. links employing both frequency modulation and amplitude modulation and radio navigational aids of all types. The department is also engaged in fundamental research including propagation studies, investigation of frequency standards, precision high frequency measurement, and the physics of materials of importance in telecommunication, for example semi-conductors, synthetic piezo-electric crystals and ceramics.

Television and radar engage a large portion of the Research Division's effort and the modern field of microwave investigations receives special attention in both its radar and communication applications.



The latest X-Ray equipment made by Marconi Instruments Limited in action at a famous London hospital.

Side by side with Marconi's manufacturing and research organizations grew up the MARCONI training system. Four years after the formation of the Company, in 1901, the first residential training school for wireless engineers was started at Frinton in Essex. This small school was the forerunner of what was to become the world-

famous Marconi College, and was established for the training of young engineers joining the MARCONI Company.

There was at that time no course of instruction in the Universities or technical colleges in the science of wireless communication, and Marconi College courses could only be given by engineers who had learned by practical experience and could pass on their knowledge to the younger generation. Though this is still the basis of MARCONI training to-day, much of the work is now part of the normal courses at many educational institutions. For example, the modern MARCONI apprentice is able to use the first-rate facilities of the Mid-Essex Technical College at Chelmsford.

Three years after the opening of the Frinton school, the centre of instruction was moved to the Company's small Chelmsford works, to provide a closer contact between training and manufacture. In 1911 a training school was set up at Broomfield, which is now the site of the apprentice training centre, and in 1920 the Company bought the Chelmsford College in Springfield where engineering training has continued until the present day.

The year 1936 saw the building of the new laboratories, offices, workshops and lecture hall at Chelmsford College, which was later renamed Marconi College, and became the centre of the company's Education Department.

The educational and training facilities of the Company continue to expand and now include apprenticeship and training at Marconi College and at the works, of students from associated companies, and of clients. There are also arrangements for junior technical, commercial and clerical staff to attend part-time courses at the Mid-Essex Technical College. All these activities are now viewed as part of a single educational programme.

This short account of the development of MARCONI training is given to show young men that the Company has always been moving in the same direction—namely, towards more and more comprehensive apprenticeship and educational facilities, in which training can be directed not only to giving a high standard to all, but also, as far as possible, to keeping an eye on, or providing for, individual talents and special capacities.

It might seem almost unnecessary to given an account of the products of the MARCONI Company, but in fact it is a good thing because, though most people in a general sense, associate the name

MARCONI with wireless telegraphy and communications, far fewer are aware of the extent and variety of the Company's products. The field is very wide.

In broadcasting and television transmission equipment it has been, from the beginning, a world pioneer, and is to-day in the forefront in these fields. The British Broadcasting Corporation is an important customer of the Company's and a great deal of what you hear and see "over the air" comes to you either wholly or in part because of MARCONI'S. For example, the first successful televising of the Oxford and Cambridge boat-race from start to finish in 1949 was made possible largely by MARCONI television cameras and transmission equipment.

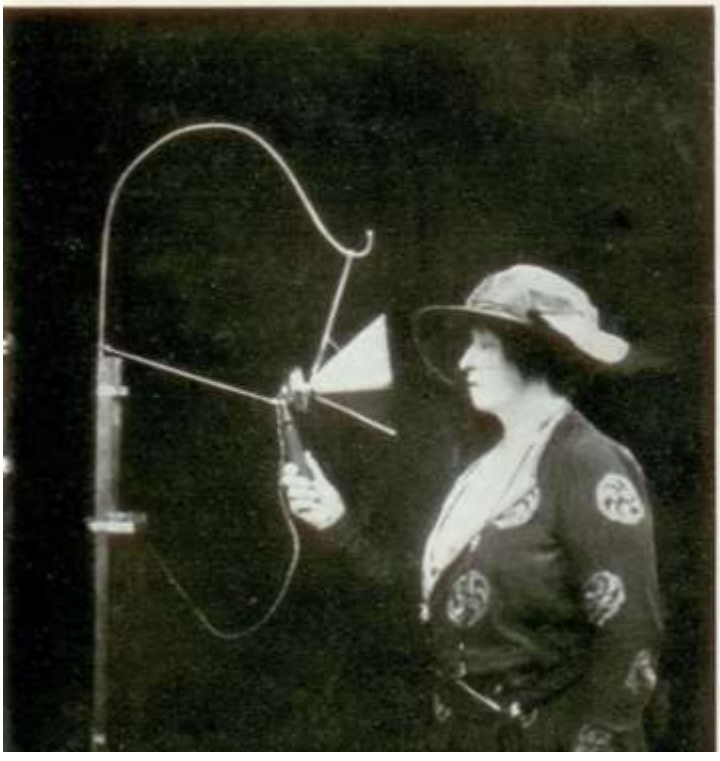
In communications, its world leadership also applies. The G.P.O. and Cable and Wireless have a long and fruitful association with MARCONI'S, as customers, which continues to-day. Marine and aeronautical apparatus manufactured by the Company includes radar, direction-finding and navigational equipment.

The Company also makes a range of very high frequency mobile equipment—including the well-known "Walkie-Talkie"—for use by the police, on airfield vehicles, by the Press, by fire services and on public transport vehicles, to quote only a few of its applications.

The Marconi Instrument Company at St. Albans produces a variety of delicate laboratory equipment for scientific and industrial measurements, precision industrial instruments and electro-medical apparatus including magnificent X-ray equipment for hospitals.

The Marconi Marine Company carries the name MARCONI to all parts of the world by means of its radio officers and equipment on board ship and at ports.

These few sentences tell you something of what the Company makes and the nature of the influence which its products exercise over people everywhere. Good communications are a powerful force for the promotion of human understanding. This fact cannot be neglected when a person considers what work he is going to do in his life.



ABOVE *In the same building as that in which Dame Nellie Melba, the famous singer, first broadcast in* 1920, *modern aircraft transmitters are now under test.*

LEFT *Dame Nellie Melba singing at* MARCONI'S.

III. APPRENTICESHIP IN *Marconi's*

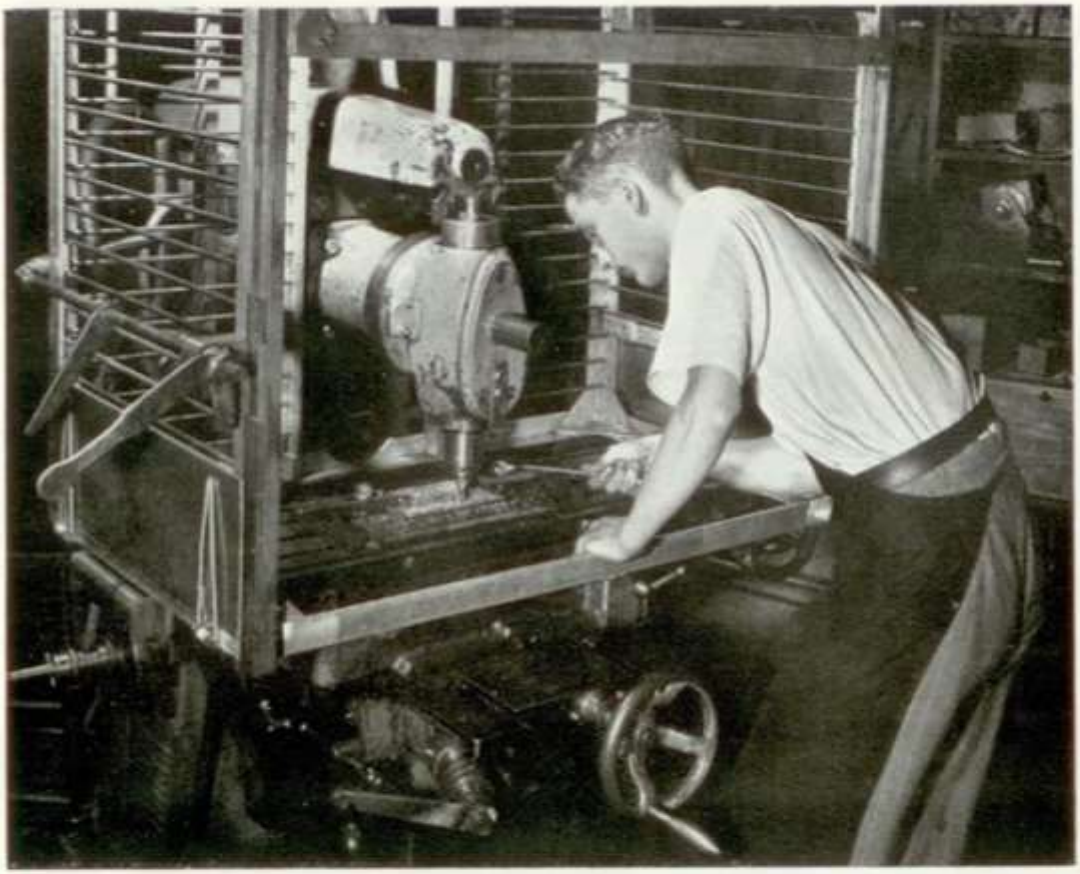
The MARCONI Company is always in need of a large number of engineers, technicians, draughtsmen and skilled craftsmen, and the apprenticeship programmes are designed to ensure that a steady flow of young men is available to fill these vacancies.

A good general education is necessary, but personality and character are of equal importance. These qualities are particularly sought in applicants for apprenticeship, since in later life many key positions in the Company will be filled from among them.

The duration of apprenticeship varies with the educational standard at entry. There are three grades of apprenticeship which will be dealt with separately in this booklet. Entrants are called:

1. CRAFT APPRENTICES
2. STUDENT APPRENTICES
3. GRADUATE APPRENTICES

Apprentices under training in sheet metal work, particularly important in radio manufacture.



Strong emphasis is laid on safety in all MARCONI *instruction.*

1. CRAFT APPRENTICES

Craft apprenticeship is offered to a young man who feels attracted to the wireless industry and wishes to become a skilled craftsman in one of the many trades open to him in the industry.

Applications for apprenticeship are considered from boys and young men who have attended a secondary, modern or junior technical school until the normal leaving age. Selection is made after an interview, on the basis of personal qualities as well as academic attainments. Applicants must also reach a certain standard of physical fitness.

After a probationary period of not less than three months, during which both the Company and the young man himself are able to form some opinion as to the career for which he is suited, apprentices are finally selected, provided they have made progress during their probation.

An Indian graduate apprentice at work with sine bar and slip gauges in the Apprentices Training Centre.

The Company gives facilities for part-time attendance at day classes in a school or technical college during the probationary period in order to enable a young man to continue his education and prepare to take full advantage of the type of apprenticeship training for which he is found to be most suited. All apprentices must attend approved courses of technical instructions at the Mid-Essex Technical College until they reach the age of 18. Those who show ability are encouraged to continue their studies.

It is recognized, particularly in the early stages, that the capacity and promise of an apprentice are not entirely dependent on his early education. The progress of each apprentice is closely watched by the Apprentice Master, both in his work at the factory and at the Technical College, so that changes in his programme may be made according to how his personality develops. In MARCONI'S, the importance of the individual is always recognized.

So as to arrange a suitable course of training according to their proposed trade on completion of their apprenticeship, apprentices are grouped as follows:

1. *Craftsmen*
   Instrument makers, tool makers, sheet metal workers, fitters, turners, maintenance fitters, carpenters and joiners, electricians.

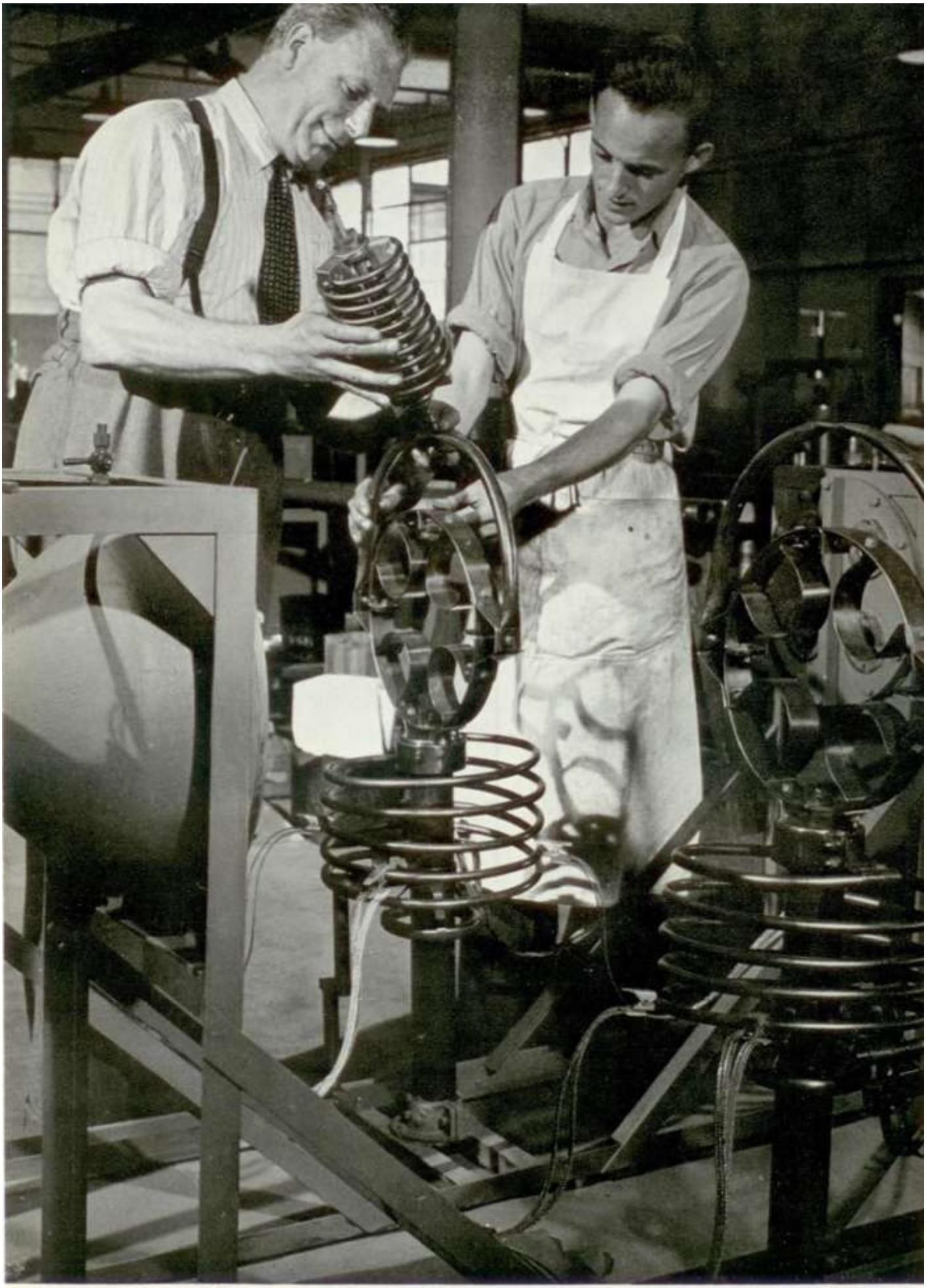
2. *Technicians*
   (*a*) Works technical and supervisory staff, in Methods, Planning, Ratefixing, Stock Control, Purchasing and Plant Maintenance sections.
   (*b*) Engineering and commercial technicians in the Research Development and Production Departments, and the various Products Divisions.
   (*c*) Draughtsmen in the Company's production, development and research drawing offices.

Transfer to Technician Group

Candidates for group 2 will normally be apprenticed as craftsmen at first and transferred to this group, if their progress in the Apprentice Training Centre and at the Technical College warrants it. Selection for transfer will usually be made between the end of the first and the end of the third year of apprenticeship, generally the latter, and is the reward for particular capacity, initiative and qualities of leadership.

Details of Training

The normal period of training for craft apprentices is five years and varies in detail according to the proposed trade of the apprentice. The basic training for many branches of engineering craftsmanship is the same, and for this reason the programme laid down for this group is described as general training. Under this heading a period of two years is devoted to functional training, a term covering the particular



An old hand directs the assembly of a test load for a high power short-wave broadcasting transmitter.

craft or function in which the apprentice will eventually be employed. This period is in addition to any time which may already have been spent on similar work.

Young men who from the beginning of their apprenticeship wish to become electricians, joiners or carpenters will not go to the Apprentice Training Centre, but will spend the whole of their five years working with the electricians, joiners and carpenters respectively.

The table below shows the division of time in months, for the various groups of apprentices during their training. It does not necessarily show the order which will be followed or the particular shop or department in which training will be given. Nor is this training programme rigid; it is modified to suit individual cases.

TYPE OF WORK (MONTHS)	*General*	*Draughtsmen*	*Tool Designers*	*Works Supervisory Staff*
Apprentice Training Centre	12	12	12	12
Sheet-metal work and welding	6	6	6	6
Instrument assembly	6	6	—	6
Heavy assembly	6	6	—	6
Instrument making	6	12	—	6
Tool making	—	—	30	6
Tool Drawing Office	—	—	6	6
Drawing Office School	—	6	6	—
Functional training	24	12	—	12
Total	60	60	60	60

Part-Time Day Courses

Craftsmen are encouraged to continue their general education during their apprenticeship and to take the appropriate vocational courses, leading to the Certificates of the City and Guilds of London Institute.

When an apprentice hopes to transfer to group 2 and has the necessary educational background, he is advised to take a course leading to the Ordinary National Certificate in Electrical or Mechanical Engineering, or other approved course, on the recommendation of the Apprentice Master. Apprentices who are transferred to group 2 may also be advised to try for the Higher National Certificate, if their progress is thought to justify the further part-time day release.

Transfer to Student Apprenticeship

Apprentices who are following technician training and have passed the Ordinary National Certificate in Electrical Engineering by the end of their third year may be transferred to Student Apprenticeship, and have the remainder of their training modified accordingly.

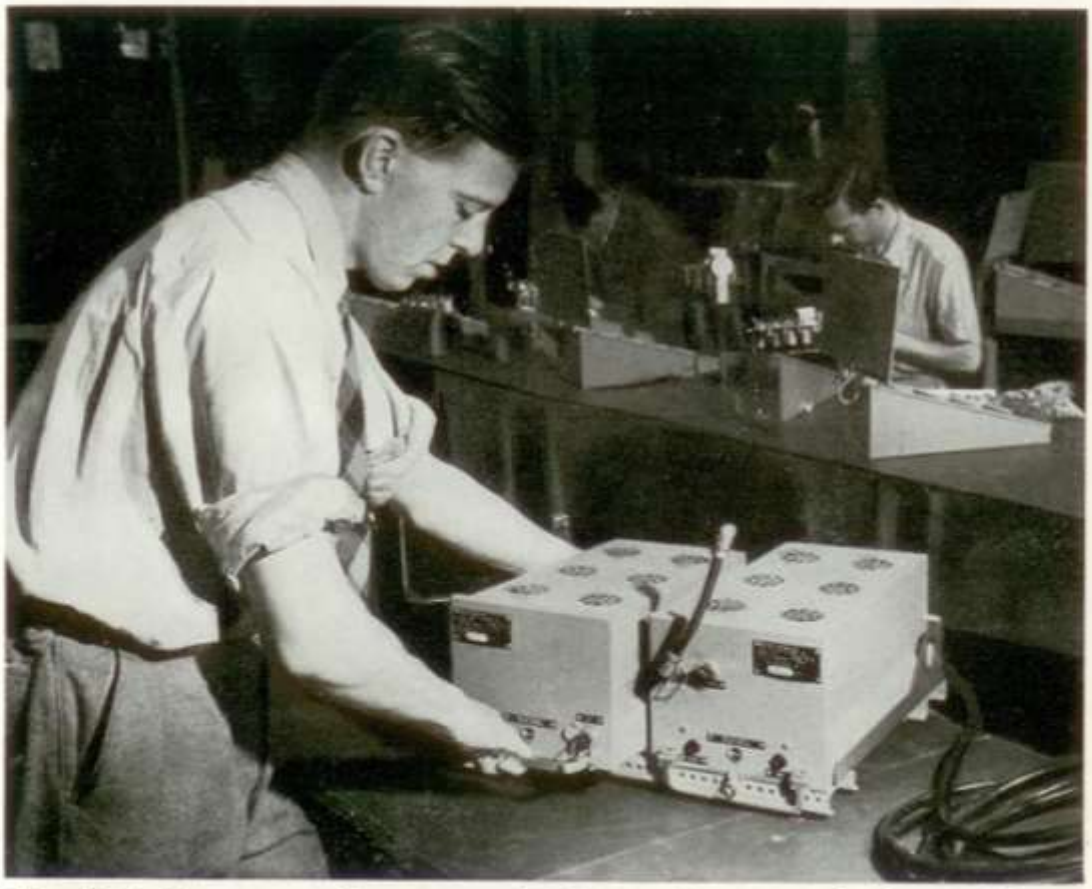
Rates of Pay

The rates of pay for craft apprentices have been agreed on a national basis, and prospective apprentices will have these explained to them when they make their application.

Application for Admission

Application for admission as an apprentice is made in the first place to the Manager of Education Department, Marconi College, Chelmsford.

Applicants attend the works for an interview with the Apprentice Master before being accepted on probation. Travelling expenses are refunded at an interview arranged by the Company.



Very high frequency police communications equipment at final assembly.

2. STUDENT APPRENTICES

This type of apprenticeship is intended for boys who aim at becoming professional engineers—that is, corporate members of one of the chartered engineering institutions namely the Institutions of Civil, Electrical or Mechanical Engineers—and wish to obtain their technical education by part-time study during their apprenticeship. It is an alternative to full-time technical education at a University or technical college, followed by graduate apprenticeship.

The normal age of entry for student apprenticeship is seventeen years for boys who have gained a school certificate, and have taken part of the course for the higher school certificate.

Under the new examination regulations which will come into effect in 1951 the standard required in the general certificate of education will be a credit in mathematics, physics and English and one year of the work in these subjects for the advanced standard.

Applications should be accompanied by a recommendation from the boy's headmaster as to character and personal qualities.

When their training is complete apprentices will normally be transferred to the technical staff of the Company, provided that their work has been satisfactory.

Training Programme

The following table shows the division in months, of time in a student apprentice's programme:

Apprentice Training Centre	6
Sheet-metal and welding	4
Instrument assembly	4
Heavy assembly	4
Instrument making	4
Drawing office	4
Marconi College	6
Test and preliminary functional or special product training	16
Total	48

Part-Time Day Courses

Student apprentices normally follow a course leading to the Ordinary and Higher National Certificates in Electrical Engineering (Radio Communication) at the Mid-Essex Technical College. The standard of education required for entry into this class of apprenticeship will

generally permit direct entry to the second year of the Ordinary National Certificate course, except that Engineering drawing may be required as an extra subject for one year. This means that an apprentice who passes each year of the course may obtain both certificates during the four years of his apprenticeship.

Qualification for Professional Engineer Status

In order to qualify in due course for corporate membership of the Institution of Electrical Engineers, apprentices who are taking the Ordinary National Certificate and the Higher National Certificate in Electrical Engineering should take any additional subjects needed to obtain exemption from the Associate Membership examination.

Apprentices following the courses for the same certificates in Mechanical Engineering should take the extra subjects required by the Institution of Mechanical Engineers.

The reason for advising this course, leading to the status of "professional engineer," rather than a degree course, is that it involves a number of distinct stages, each with its own recognized examination standard. A candidate for the external degree of B.Sc. (Eng.) of the University of London will, if he achieves success, attain a higher technical qualification, but if he fails to reach this higher level, he will have no qualification whatever and no exemption from the corporate membership examinations of the professional institutions.

For this reason, apprentices will only be encouraged to take the course for a London University external degree in exceptional circumstances.

Rates of Pay

The rates of pay for student apprentices have been agreed on a national basis, and prospective apprentices will have these explained to them when they make their application.

Application for Admission

Application for admission as an apprentice is made to the Manager of Education Department, Marconi College, Chelmsford.

Applicants attend the works for an interview before being accepted on probation. Travelling expenses are refunded at an interview arranged by the Company.

A study in concentration: at the Drawing Office School where apprentices learn the Company's drawing office system as well as the art of draughtsmanship

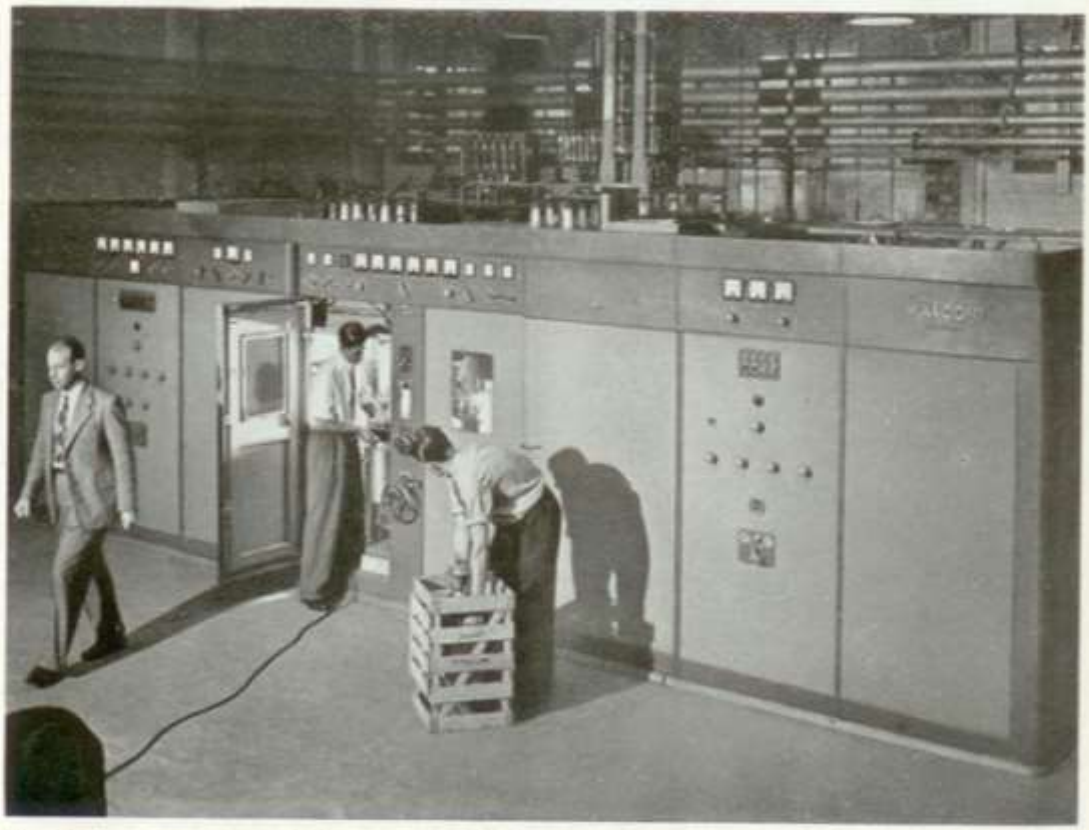
3. GRADUATE APPRENTICES

Graduate apprenticeship provides practical training for University graduates who wish to enter the electrical engineering industry on the light-current side. The apprenticeship covers a period of two years and includes basic mechanical training, basic electrical training and experience in the Drawing Office and Test. A period is also spent at the Marconi College, where theoretical and experimental instruction is given to supplement the work which has already been done at the University. A short period of preliminary functional training may also be included during the last months of apprenticeship.

Details of Training

Alternative programmes are provided for graduates, according to their education and experience at entry, and the function within the Company's organization for which they are being trained.

A. Normal course for graduates in engineering including telecommunications.



Final tests on one of the newest high power transmitters being manufactured for Cable and Wireless Ltd.

B. Course for graduates in engineering or physics, who have done little or no work in telecommunications.

C. Course for graduates in engineering or physics, including telecommunications, who have had some workshop experience.

D. Course for graduates in engineering or physics, intended for employment in research work.

Preliminary functional training will vary with the function to be performed by the apprentice at the completion of his training. This may include experience in research and development laboratories, design offices, or in the offices of one of the Products Divisions of the Company.

When it is known that an apprentice will join one of these particular branches, his training may be biased in this direction during the final period of preliminary functional training.

TYPE OF WORK (MONTHS)	COURSE A	COURSE B	COURSE C	COURSE D
Apprentice Training Centre	24	24	—	—
Sheet-metal and welding	4	4	—	—
Instrument shop	2	2	—	—
Instrument assembly	4	4	4	—
Transmitter assembly	4	4	4	—
Final process	1	1	1	—
Works orders and production planning	4	4	4	—
Drawing offices	8	8	8	—
Marconi College	13	22	13	—
Test, installation or preliminary functional training	36	27	16	26
Holidays	4	4	2	—
Total	104	104	52	26

Part-Time Classes

Since the standard of entry demanded is a degree in engineering or physics and this academic standard is supplemented by a course at Marconi College, it will not normally be necessary for graduate apprentices to attend a course at one of the technical colleges, except when a candidate reveals a special weakness or when additional subjects are necessary in order to perform a particular job.

Vacation Training

Arrangements are made during the university long vacation for students to obtain practical experience in the Company's workshops and laboratories. Selection for this work is made from applicants nominated by university professors and other college authorities.

Students who come into the factory for their first long vacation are normally employed in mechanical engineering workshops. Those who have already done such work the previous year will be employed in Test, provided that their technical background is adequate for the work.

The normal period for vacation training is six to eight weeks, during which time students will, if possible, work in two different workshops or sections of Test.

A maintenance allowance is paid to vacation students during their period of training.

Application for Admission

Our representatives visit the Universities and technical colleges in the spring of each year for the purpose of interviewing candidates for graduate and vacation apprenticeship. The dates and times of these visits are notified either to the secretaries of the appointments boards or to the heads of departments, who make arrangements for candidates to be seen.

If a candidate is unable to be present at one of these University or college interviews, he can apply direct to the Principal, Marconi College, Arbour Lane, Chelmsford. Travelling expenses incurred by a candidate when he attends for an interview at our request will be refunded to him.

Rates of Pay

Details of rates of pay and conditions of employment will be given to applicants at their interview.

Marconi Instruments Ltd.

Apprenticeship facilities are available with Marconi Instruments Ltd., on similar lines to those already described.

Graduate apprenticeship is served partly at Chelmsford where, before entering the workshops and laboratories at St. Albans, the apprentices receive the benefits of a course at the Marconi Apprentice Training Centre and Marconi College.

An apprentice assembling large condenser vanes for a transmitter.

EDUCATIONAL AND TRAINING FACILITIES

Marconi College

The centre of engineering training is at Marconi College, where courses are held for young engineers joining the Company from the Universities, and for selected nominees of associated companies and clients. Instruction is mainly experimental and tutorial, since by this means it is possible to give largely individual attention to students. This method is also of advantage to overseas students of varying fluency in the English language and with differing technical background.

The main buildings are the College itself and the Residence, where accommodation is provided for 15 students. The former has three laboratories, lecture hall, workshops, and tea-room on the ground floor, while on the first floor are the common-room, library and administrative offices of the Education Department of the Company, as well as the offices of the instructional staff. In the grounds there are huts containing one long-wave and three short-wave transmitters for experimental purposes and micro-wave and pulse equipment for experimental work in the radar course.

Training at Marconi College is part of the programme of the Company's student and graduate apprentices. The world-wide reputation of the College gives this part of the course considerable prestige with apprentices on account of the College's place in the history of wireless communications. Full details of the College's wider courses are given in a separate booklet.

Apprentice Training Centre

Before passing into the production workshops, the apprentice goes to the Training Centre where he is given a thorough grounding in workshop practice. The principle followed in the Apprentice Training Centre is to place apprentices under a man who is not only skilled in his trade but also a good instructor. The accommodation at the Centre allows 60 apprentices to be trained at once, and the programme is regulated so as to keep and even flow passing through the shops. From 6 to 12 months are spent there according to the type or apprenticeship. Division of time in weeks is according to the table on the following page.

SECTION	CRAFT APPRENTICES	STUDENT APPRENTICES	GRADUATE APPRENTICES
Drilling machines	4	2	2
Milling machines	4	2	2
Capstan lathes	4	2	2
Centre lathes	8	4	4
Instrument making (*i*)	8	8	8
Sheet-metal work and welding	8	4	4
Assembly and wiring	4	2	2
Instrument making (*ii*)*	8	—	—
Total	48	24	24

**Instrument making is divided into two periods, the first in which instruction is given in setting out work and the use of hand tools, and the second period to provide practice in precision fitting and instrument work.*

In addition to the practical work which is done in the Centre, lectures are given to the apprentices on a wide variety of subjects, by the staff of the Education Department and by other members of the Company's staff. Methods of instruction include the use of sound film, filmstrip and epidiascope.

One important feature of work at the Centre is the concentration on safety. It is a part of the system to aim at producing careful as well as competent workers, and with this end in view, special safety training has been organized, including the making up of safety guards and other safety precautions.

Drawing Office School

When an apprentice has been selected for training as a draughtsman, his apprenticeship will include a period in the Drawing Office School.

This school is equipped with the latest drawing office equipment and arranged in such a way that training may be given both in draughtsmanship and in the Company's drawing office system. Thus the apprentice is able to absorb much of the routine which is followed in the Company's drawing offices during his period of training.

The work includes examples of most types of drawing used in the Company, as well as instructional exercises and when the trainee has reached a sufficiently high standard of efficiency he is employed on production work which is allocated to the school by the Supervisor of Drawing Offices.

In addition to the apprentices, who take a six months' course, there are a number of junior draughtsmen who go to the school for a shorter period of instruction in the Company's system.

Part-Time Day Release

As part of the Company's policy to provide educational facilities for its younger employees, arrangements have been made for their release on one day a week to enable them to attend part-time classes at the

An instrument maker at work on clocks for high precision frequency measuring equipment.

Mid-Essex Technical College in Chelmsford, or in certain cases, at one of the London Polytechnics. Applications are made on special forms. After approval by the Manager or Chief of Division concerned, they are submitted to the Education Department. Applications are dealt with in different ways according to the age of the applicant.

Under 18 *years of age.*

Permission will be granted for release to attend part-time classes on one day a week, provided an approved course is selected and satisfactory progress is made.

18-21 *years of age.*

Permission may be granted for release to attend part-time classes on one day a week, for promising students to continue training.

Over 21 *years of age.*

In special circumstances permission may be granted for release to attend part-time classes on one day a week to complete an advanced course: e.g., degree or Higher National Certificate, for a period not exceeding 3 years.

For employees whose work requires commercial qualifications there are courses leading to the National Certificate in Commerce and also enabling them to prepare for professional examinations in secretarial work, accountancy and industrial administration. Junior clerical workers who have not been trained for other work may obtain permission to attend classes in shorthand, typewriting and English on two half-days per week.

Any changes in the conditions for part-time day release are announced each year in the month preceding the period of enrolment.

Evening Classes

In some cases employees who are not eligible for part-time day release wish to attend evening classes in a subject which will be of advantage to them in their normal employment. The Company will refund the amount of the course and examination fees, if approval is obtained before enrolment, and subject to satisfactory progress being made during the year. Application for approval of a course and claims for repayment, supported by evidence of satisfactory progress are sent to the Education Department, Marconi College.

Service with something more than a smile at the canteen where 2,500 meals are served every day.

The MARCONI *staff pensions scheme—one of the oldest in the country—is greatly appreciated by those who benefit by it.*

A patient receiving diathermy treatment in the modern medical section at MARCONI'S *Chelmsford factory.*

IV. THE CORPORATE LIFE IN *Marconi's*

The reputation of the name MARCONI means more than fame in the world of wireless. When an apprentice joins the Company he finds that he is introduced not only into a great modern industrial organization, but also into a world in which human values and individuality count, and in which the well-being of people is important. Parents and guardians have as much interest in this fact as the young men themselves.

The Company has a vital corporate life which stimulates the whole MARCONI family and makes it a happy one. Here are some of the things which Marconi's Wireless Telegraph Company does for its workpeople.

The Company's pensions scheme for its staff is one of the oldest in the country. There is a benevolent fund for the relief of distress.

First-class medical facilities are provided for cases of accident and sickness, in charge of skilled nurses and doctors. Sunray and remedial treatment of various kinds are available when required.

There are modern canteens at the main works, New Street, Chelmsford, and at the Research Laboratories, Great Baddow. At the main works 600 principal meals and 1,500 to 2,000 subsidiary meals are served a day.

The Marconi Athletic and Social Club has over 1,000 members and includes a dozen different sporting and social sections, from football to amateur dramatics. There is a club-room at the works with three full-size billiards tables. The sports ground at Waterhouse Lane has an area of about 21 acres, with hard and grass tennis courts and a bowling green as well as grounds for the other popular games and sports.

Inside the MARCONI organization people find that there is something for everyone in its social and corporate life. The "sense of belonging" is very strong, and it is this which creates loyalty.

Marconi Apprentice Association

There is a very active Apprentice Association, membership of which is open to all past and present apprentices employed by the Company. The activities of the Association include sporting and social events which are organized by the Committee of the Association. In this connection the office-holders and other apprentices obtain much valuable experience.

Living Conditions

The Company, with its long experience of this very personal housing problem, does its best to help apprentices to find lodging at a price which they can afford, and its interest in their living conditions is a permanent one throughout their apprenticeship.

Works Rules

An apprentice is bound to abide by the ordinary rules of the department in which he is working, but these are nothing more than the normal discipline of a corporate life of any kind.

Supervision

Apprentices are responsible to heads of the departments in which they are working and to the Education Department which has the general supervision of their training and welfare. The Apprentice Master, too, takes a personal interest in every apprentice's career, and is always there to help and encourage when this is needed.

Reports and Progress

At suitable intervals reports on each apprentice are sent to the Education Department by foremen and departmental heads. Reports are also received from the Technical College.

The Principal of Marconi College or the Apprentice Master is always pleased to discuss personally their son's progress with parents.

Exchange of Visits

It is a principle of the Company that apprentices shall be given as broad a view of the engineering and other industries as possible. Hence the exchange of visits between works in the ENGLISH ELECTRIC group is encouraged, also between a wide variety of works in the London and Home counties region. The visits within the group are particularly valuable since they emphasize the resources of the group to apprentices even though the apprentice schemes throughout the group are not fully interchangeable.

The Marconi Tradition

This is something of the human background in which the apprentice at Marconi's works. It is as important as the tradition of skill and inventiveness which the name MARCONI has come to mean in the world of radio communications. During his training the apprentice will learn in his corporate life in the Company many things about the organization of human affairs, apart from his work. This is always the wish of the MARCONI Company whose daily task it is to further understanding between people by providing them with the means of closer communication with one another.

The first man to speak across the Atlantic by wireless—Mr. W. T. Ditcham, looks back at a statue of the genius who made wireless possible GUGLIELMO

THIS INSCRIPTION APPEARS ON THE MONUMENT WHICH MARKS THE SITE OF THE MARCONI WIRELESS STATION AT POLDHU

The Poldhu Wireless Station was used by The Marconi Company for the first trans-oceanic service of wireless telegraphy which was opened with a second Marconi Station at Glace Bay in Canada in 1902. *When the Poldhu Station was erected in* 1900, *wireless was in its infancy, when it was demolished in* 1933, *wireless was established for communication on land, at sea, and in the air for direction finding, broadcasting and television.*

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The Marconi Sounding Device Company, Limited, Marconi Offices, Electra House, London, W.C.2.
Radio Communication Company, Limited, Marconi Offices, Electra House, London, W.C.2.
Marconi Instruments, Limited, St. Albans, Hertfordshire.
Marconi International Code Company, Limited, Marconi Offices, Electra House, London, W.C.2.

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Austria
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Belgium and Belgian Colonies
Société Belge Radio-Electrique S.A., 66 Chausée de Ruisbroek, Forest-Bruxelles.

Bolivia
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Chile
Gibbs & Cia., Casilla 67-D, Santiago.

China
Marconi (China) Ltd., Queens Building, Chater Road, Hong Kong.

Denmark
Sophus Berendsen Ltd., Post Box 372, Copenhagen V.d.

Ecuador
Compania Pan Americana de Comercio S.A., Pichincha 111-113, Cuayaquil.

Egypt
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Finland
de Jersey & Co. (Finland) Ltd., Mikonkatu 9, Helsinki.

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Nyasaland
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