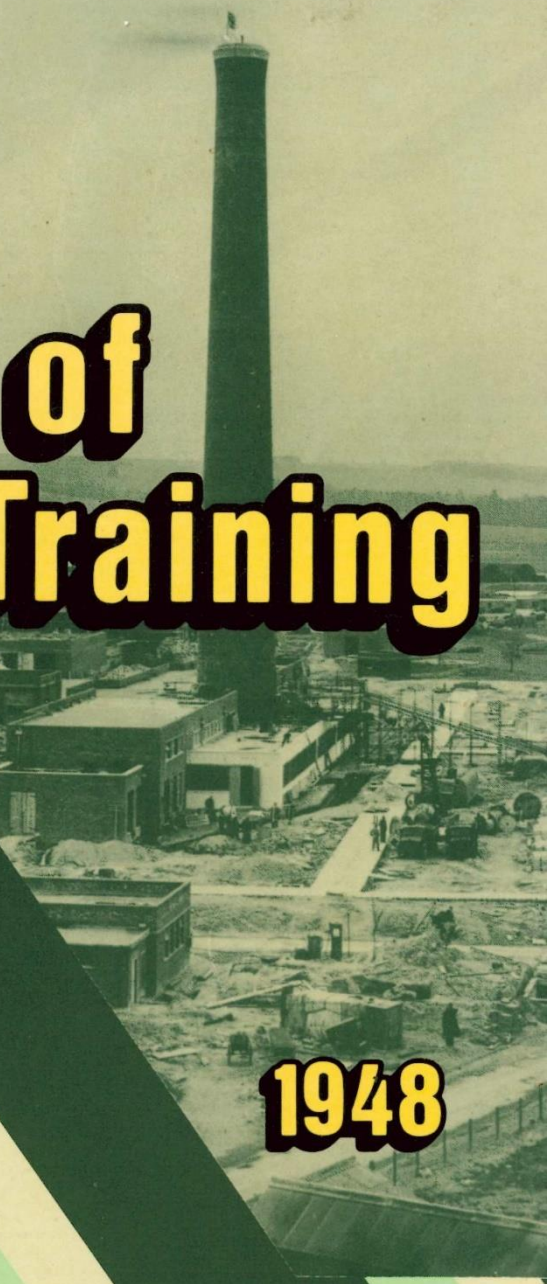
The First Thirty Years of Apprentice Training at Harwell



1948

1978

HARWELL
Education & Training Centre

THE FIRST THIRTY YEARS OF APPRENTICE TRAINING AT HARWELL 1948 - 1978

Compiled from memories of staff involved, Apprentice Board minutes and related papers.

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THE FIRST THIRTY YEARS OF APPRENTICE TRAINING AT AERE HARWELL

CHAPTER 1

IN THE BEGINNING

Harwell has established itself in the general publics view to be the UK centre for nuclear research. Some people would know in detail the various types and areas of research carried out at Harwell, but few would be aware of the Apprentice Training Scheme. Yet since the scheme was started in 1948, about eight hundred young men have been trained in the school to the very highest standards of proficiency.

Assuming that the average earnings of these trained apprentices were no more than the current (1983) rate for a Professional/Technological Officer III then the group as a whole would have earned some £300 million when the last of them retires around the year 2025. Hopefully they will have contributed much more than that to the economic well being of the nation.

The names of many of those young men are now to be found throughout the highest grades in the Atomic Energy Authority and the nuclear industry while others, as lecturers and teachers in universities, schools and colleges, or as training managers in industry, are already beginning to reproduce their kind. Ex-Harwell apprentices can be found wherever advanced scientific or technological research is being carried out, whether in the UK or overseas and in some cases they have set up their own companies to meet demands for some highly specialised product or service, and it is known that at least one is now President of a large American Corporation.

As time advances and those responsible for the introduction and formation of the scheme retire, there is a demand, not least from the apprentices themselves, for the early history, traditions and achievements to be recorded before much of the information is lost forever. It is equally important when recounting the history of the Harwell Apprentice Scheme to look much earlier than 1948 for the special circumstances which brought about the birth of that scheme and others like it at that particular point in our Industrial History.

In the late 1920s and early 1930s British industry was experiencing one of the worst depressions of its history with very high unemployment and many factories completely closed. The result was that few apprentices were being trained and in some instances those who were found that training took second place to quick and cheap production. All too often when their apprenticeship ended so did their employment.

In 1939 and 1940 during the period of 'The Phoney War' when little was happening except at sea, the development or replacement of weapons and equipment was taking place at a leisurely pace. Only when Britain stood alone after the defeat of France, and before the flood of material from America as a result of 'Lend-Lease', did the grave consequences of our shortage of skilled craftsmen really become apparent. The transition thereafter was incredible; conscription of labour was introduced making it unlawful to change jobs without approval. Many skilled men who had been mobilised with the Territorial Army were returned to industry, training centres were established by the Ministry of Labour where crash courses

were given to those with any aptitude to learn the basic engineering skills, and men and women from all walks of life poured into the new or expanding factories and shipyards. To ensure the fullest use of our resources, the Craft Unions agreed to a dilution of labour on condition that all dilutees were registered and would leave the industry after the war. Production committees were set up in every factory to improve efficiency and promises were given that after the war, training for skill would never be so neglected again.

Initially, one of the main problems facing the production committees was the improvement of 'on the job' training for the many thousands of dilutees in industry. As the duration of the war lengthened this was replaced by a growing and urgent need to improve the quality of training being offered to the increasing number of young school leavers who were being recruited as apprentices and who, when the war ended, would be called on to fill the gaps created by the departing dilutees or the losses of skilled men on war service. The Craft Unions were quick to recommend ways in which apprenticeships could be improved and most employers, anticipating a post-war boom in demand for consumer goods, were equally anxious to assure an adequate supply of well-trained craftsmen to meet this demand.

Strangely enough, it was some of the Government establishments who were the slowest in responding to this new requirment, not through indifference but due entirely to the circumstances surrounding their own creation. Many of the large 'shadow' factories of the Ministry of Aircraft Production and many tank, ordnance and filling factories of the War Department had been built virtually overnight and staffed almost entirely with labour conscripted by the Ministry of Labour and National Service. The result was that they had no tradition of apprentice training nor was such a need envisaged when they were commissioned. Indeed, it is said that many of those establishments had no provision for the employment of apprentices so that many young school leavers working there and recognised by the Unions as apprentices were in fact on the pay roll as juvenile labourers.

It was only in the Admirality Dockyards or in establishments like Woolwich Arsenal or the Royal Aircraft Establishment, Farnborough that well-established Apprentice Training Schemes were to be found. Not surprisingly, through the Whitley Committees at many of the establishments, the Government was put under considerable pressure by skilled craftsmen and Unions to introduce Apprentice Schemes which could set the standards for industry as a whole. It was not until 1945 that the Government felt able to set up a Departmental Committee "to consider the schemes of apprenticeship in the Royal Ordnance Factories and to prepare a scheme designed to meet the needs of the future". The report submitted by this committee in the middle of 1946 was accepted, almost in its entirety, and Labour Branch of the Ministry of Supply circulated to all establishments Memo Number L5/1319 which was initially the 'Gospel' for all concerned with apprentice training in Government Establishments.

This document introduced a wide range of quite revolutionary features to apprenticeships including special workshops with specially recruited training staff. There were two grades of apprentice - Craft and Engineering (subsequently renamed Student); up to two days release with pay for technical studies, residential hostels, and many other proposals which would have been considered incapable of fulfilment a few years earlier. The final two paragraphs of Memo

L5/1319 read as follows:-

18. "A Headquarters Apprenticeship Committee has been established as a sub-committee of the Ministry of Supply Joint Industrial Council with the following terms of reference:

> To observe and advise on all matters concerning the recruitment, training, education and vocational guidance with regard to apprentices, to review and advise upon the administration of any Headquarters Apprenticeship Scheme; to take steps as are necessary to secure that apprentices in numbers appropriate to the needs of M.O.S. establishments are trained and employed under an approved apprenticeship scheme, and generally to overlook and ensure the effective and efficient operation of any Headquarters Apprenticeship Scheme.

19. Establishments which at present employ apprentices should take any necessary steps to bring their scheme in line with the recommendations of the Committee as summarised above. Any cases of doubt or difficulty should be referred to the Branch (L5) for the consideration of the Headquarters Apprenticeship Committee. Establishments which do not at present employ apprentices and feel that it is desirable to do so should submit their proposals similarly for the approval of the Committee".

The Memo must have reached Harwell in the late summer of 1946 when a small group of staff were trying to convert a derelict aerodrome into a nuclear research laboratory, and another small team of scientists and engineers were endeavouring to construct Britain's first nuclear reactor, GLEEP. Under these circumstances it is surprising that anyone at Harwell found time to read the L5 Memo from London and even more surprising that anyone took the trouble to act on it. But men like the first Chief Engineer, Harold Tongue and the Senior Administrator, A B Jones were not easily deterred from doing what needed to be done. It was realised that as soon as the initial problems were resolved, Harwell would need and could support an Apprentice Scheme on the lines proposed.

The L5 Memo made provision for each Establishment to set up an Apprenticeship Board of management and employee representatives to be responsible for "the selection, training and vocational guidance of apprentices". On 18th April 1947 a group of staff were invited to consider the feasability of establishing an Apprentice Training Scheme at Harwell. Those present on that occasion were Mr H Tongue, Chief Engineer; Mr J Diamond, Senior Reactor Engineer; Mr K Dickinson, Labour Manager; Mr H Norwood, Workshop Manager, Mr S Price, Assistant Workshop Manager; Mr Canning, Workshop Foreman; Mr T Dyke, Leading Draughstman; Mr F Razzell and Mr J Wallace who were both skilled craftsmen. This committee quickly decided that an apprentice scheme should and could be run, although a start might not be possible until 1948. The Apprenticeship Board was then established as a permanent feature, although the pressure of other commitments brought about a number of changes in membership.

The composition after the first few months ultimately became:-

Mr J Diamond	-	Chairman
Mr G K Dickinson	-	Labour Manager
Mr S Price	-	Asst. Workshop Manager
Mr D Mettrick	-	D.O. Manager (Secretary)
Mr R Jackson	-	Reactor Engineer
Mr F Jeanes	-	Draughtsman
Mr F Razzell	-	Skilled Craftsman
Mr J Wallace	-	Skilled Craftsman

By February 1948 pressures of other work compelled Mr J Diamond to pass the Chairmanship of the Board to Mr M J Marchbanks who was then assisting Mr Tongue. Three months later when Mr J Wallace was appointed Chief Instructor of the Harwell Apprentice Scheme, Mr G Rowlands was appointed as the new skilled craftsman representative to the Board.

During this period a training workshop was established, seven Craft Apprentices were selected by the Harwell Apprenticeship Board and six Engineering Apprentices were appointed by the Civil Service Commissioners to start at Harwell on 7th September 1948. In the course of selecting the equipment for the workshop it had been suggested that as the new entrants would all be school leavers, duckboards should be provided to enable them to be at the right height for benches and vices. When in fact they reported for duty, all but two of them were several inches taller than the Chief Instructor. The special ration of cod liver oil and orange juice to children during the war had obviously paid dividends! Only eight benches were available when the new apprentices reported for duty, so that instead of handling the group as a unified class, the Instructor was faced with the task of concurrently instructing eight apprentices on the bench, two on different lathes, two on different milling machines and one on a shaping machine. By the end of the first week when one lathe was out of commission and one apprentice had gone home, never to return, disaster seemed imminent. However, in a few weeks when the new benches had been delivered the enthusiasm of the boys themselves guaranteed success. The Harwell Apprentice Scheme was now in being: only time would determine its' worth.

CHAPTER 2

THE CRAFT APPRENTICE

Of the two grades of apprentice designated in the original Ministry of Supply scheme, the Craft Apprentice was the one which most quickly came to the notice of the local residents and the schools in the towns and villages around Harwell. An important clause in the Ministry scheme laid down that some 75% of the Craft Apprentices places be reserved for boys from the locality and about 25% be reserved for boys from the region. This meant that Abingdon, Didcot, Wantage and all the immediate villages were considered local, while Oxford, Newbury, Reading and Swindon were considered regional. This was the one degree of preference given to sons of Harwell employees who, at that time, lived mainly in the local area. It also improved the opportunities for many local boys who might never have thought of engineering as a career if AERE had not appeared on their doorstep. It had the effect of making it very competitive for applicants from the region, but of course, openings for apprentices were much more numerous in those towns at that time.

Initially, an apprenticeship in any of the engineering trades lasted five years and ended on the apprentice's twenty-first birthday. In some parts of the country there was considerable reluctance on the part of local trade union officials to allow any reduction in the length of apprenticeship, so it was fairly imperative that recruitment was made as close to the age of sixteen as possible. Any boy recruited over sixteen served less than the desired five years, and as the school leaving age was then fifteen, any boy recruited under sixteen was designated a Pre-apprentice learner until his sixteenth birthday, and in consequence received rather more than five years training. As will be seen later, extensive modifications would eventually be made to many of those conditions, particularly when the school leaving age was raised to sixteen and the duration of apprenticeship reduced to four years.

Within a year or two following the end of the war, day-release to attend technical college was widely accepted for apprentices and many other young trainees, but was almost unheard of for adult employees. In consequence, the lower levels of technical courses were becoming more readily available during the day, but most colleges were trying to satisfy the almost insatiable demand for evening classes from all those who had been denied the opportunity to continue their studies during the war because of National Service, change of employment, extensive overtime etc. At Harwell every weeknight one or two site coaches, filled with young (and not so young) craftsmen, draughtsmen and others, left for Oxford Technical College where seven or eight Ordinary National Certificate courses in Engineering, with three subjects per course, were being run concurrently each week. The introduction of Harwell Craft Apprentices to this pattern of technical education was not achieved without difficulty. Initially Oxford College was used for all technical studies, but after only a few years the problems became almost insurmountable. An annual intake of six or seven boys was insufficient to justify a class for Harwell alone. Quite apart from differing levels of attainment among the recruits, the generosity of the Ministry in granting one and a half days for technical studies (instead of the more common one day) added to the difficulties. The additional subjects made possible in this extra time were not consistently available during the day and in some years had to be taken as an evening class.

The most intransigent problems however were brought about by the wide dispersal of the apprentices' homes. Getting boys to and from Oxford from places like Compton, Challow, Lambourn, Farringdon and Hampstead Norris would tax any transport officer. Also, as the numbers increased the Education Officers from Berkshire and Wiltshire became more reluctant to pay 'out of County Fees' to Oxford for boys on courses which they quite rightly maintained were available at a college in their home county. At a later date, having succumbed to this pressure, the new problems arose associated with choice of subject. For example, in classes where boys were at colleges dominated by the locomotive industry in Swindon, the mass produced motor car in Oxford or the manufacture of biscuit tins and pumps in Reading. It will become apparent later how many of the unique and highly successful features of the current scheme of related technical studies at Harwell result from the gradual solution of those early problems.

In the sphere of practical training, the dominant feature of the Ministry scheme was the provision of a training workshop where for one year the young apprentice could be given practical training in the basic hand and machine skills by an Instructor whose sole duty this was. The surprising feature, when looked at today, is how the whole concept was based mainly on mechanical engineering. Indeed, most engineers would find little of relevance to Harwell among the list of approved trades for which apprentices could then be trained and which were as follows:

Tool and Gauge Maker
Blacksmith, Toolsmith and Hardener
Turner
Miller
Planer, Shaper and Slotter
Fitter
Millwright
Electrician
Sheet Metal Worker
Bricklayer
Carpenter and Joiner
Moulder and Coremaker
Patternmaker
Boilermaker and Plater
Welder

It will become apparent that many changes were made to this list, but nevertheless, some time was to pass before such terms as Instrument Making, Electronics, Instrumentation and Control were in common usage in the scheme, or before special training workshops were set up to cater for some of those skills.

To begin with, the apprentice made his choice of trade on his application form. Although the choice frequently proved inappropriate and based on hearsay, it was somtimes difficult to persuade him that an alternative would be more advantageous. Ultimately, it was recognised that most boys were quite clear as to whether they wished to work in mechanical or electrical engineering, carpentry or one of the building trades. They were asked to make this broad choice initially, and their ultimate specialisation was determined by their subsequent progress. In this way their final choice was based on some knowledge of the work involved and additionally there was the incentive of having to attain the required standard. The choice of trade could also mean the choice of a different college course with the aggravation of a number of the problems referred to earlier. So although the scheme was quickly off the ground much remained to be done as a result of the experience gained during the first year or two.

CHAPTER 3

THE STUDENT APPRENTICE

In the early days of the Scheme some young men were being trained to become Professional Engineers and were known as Engineering Apprentices. Those who undertook two years of industrial training following the award of an Engineering Degree at University were known as Student Apprentices. By early 1954 those titles had been changed to Student Apprentice and Graduate Apprentice respectively in keeping with the nomenclature which was becoming generally accepted throughout industry. The Ministry of Supply Scheme had envisaged that Student Apprentices would be recruited at the age of sixteen to seventeen with a good School Certificate (roughly equivalent to 'O' levels). By two-day release per week during their five years training they could obtain Ordinary and Higher Certificates with suitable endorsement subjects which would qualify them for recognition by one of the Professional Institutions. Provision was made for the award of Scholarships, which would enable outstanding, suitably qualified Student Apprentices to attend University after completing two years of their training and it was also possible for suitably qualified Craft Apprentices to be considered for regrading to Student Apprentices.

It will be apparent that in these early years the distinction between Craft and Student Apprentices was quite small and indeed in many Ministry of Supply Establishments a large number of Craft Apprentices finished up as well, or better qualified than their Student counterparts. Harwell together with Farnborough and Malvern, by attracting the cream of the applicants saw little of this problem however. As candidates were given their choice of Establishment according to their order of merit in the Civil Service Commission Selection, then the glamour of the above establishments proved too strong an attraction compared with the then declining status of the post-war Royal Ordnance Factories. Nevertheless, this apparent good fortune for Harwell brought its own crop of problems. This was a period when there was a growing demand from parents for Higher Education for their children. As many of the newly recruited students at Harwell were already well on the way to satisfying University entrance requirements, it was apparent that for many this would be a more appropriate route to Professional Qualifications than the part-time Higher National Certificate route, previously envisaged. This meant that in their first two years at Harwell, instead of studying for Ordinary National Certificate, this group studied for the Intermediate BSc Examination which together with Higher School Certificate (the forerunner to 'A' levels), was one of the accepted routes to University entrance. An interesting outcome of this decision was that because of the demand from Harwell and Aldermaston for this course for their Student Apprentices together with a number of Assistant Experimental Officers, Newbury College of Further Education became a major examination centre for the Inter BSc examination, second in the country only to Birmingham.

Over the years the Student Apprentice Scheme was to be subject to massive and continuous change and each apparent improvement brought in its wake a new series of problems. Many of these problems were the result of the divided opinion which has always existed among engineers themselves as to whether practical experience or academic attainment should be the major ingredient when determining a man's suitability for professional status. Initially, the M.O.S. scheme placed the emphasis on the former. Hence Student Apprentices had the same hours, conditions and rate of pay for age as the Craft Apprentice.

As mentioned earlier he also followed a part-time course of study to his ultimate qualification, with approval for a full-time degree course being very much the exception. The progressive raising of both age of entry and entry qualifications began to shift the emphasis. This was accelerated by the rapid expansion of the Universities and the creation of new Colleges of Advanced Technology (CATs). The latter had a thin sandwich course consisting of six months in industry alternating with six months at college for a period of four or five years and the final qualification of a Dip Tech which equated with a BSc(Eng) and had similar levels of Honours.

If this new course was used then it meant that the student entered college at the end of one year of training. It was therefore logical to make the same decision for the student with a place at University for a three year full-time degree course thus leaving a post-graduate year for advanced practical experience. Those changes brought increasing pressure for some change of status and in due course the student apprentice was made a staff appointment with salary and conditions more in keeping with Technical, Managerial or Commercial Apprenticeships then being offered quite widely in industry.

An Atomic Energy Authority Student Apprenticeship was highly sought after because not all similar schemes paid the full salary for the duration of the college course in addition to all fees, travelling expenses and cost of text books. So, the selection of the fortunate few from some hundreds of applicants became a major annual exercise. The detailed impact of those developments will be touched on more fully later, but it would seem that as the amount of time spent at Harwell in the early years of his apprenticeship was reduced, the student's sense of attachment also diminished and the scheme came to be looked on more as an alternative source of grant. This in turn gave rise to new problems. At the end of the degree or diploma course more of the outstanding student apprentices could be persuaded by their college tutors to accept a State Scholarship and continue for a Higher Degree, or alternatively were caught in the annual "Recruitment Circus" at University and attracted to a more highly paid post in industry.

Unlike many private companies, Harwell had never insisted on sponsored students continuing in their employment for two years after graduation. It had always recognised that the original staff employed there had all been trained at someone else's expense, so any trainees choosing not to accept posts at Harwell were additions to the national pool and replaced those drawn by Harwell in earlier years. This loss was serious nevertheless and was further aggravated by the fact that a few others failed the course completely while some of the remainder did not graduate with the first or second class honours normally required of applicants for professional appointments in the Authority. Ultimately, when a group of twenty-three student apprentices produced many young professional engineers but only two returned to Harwell, it was decided that it was time to pause and rethink the problem of training in this particular field.

However, the Chilton Rutherford Laboratory of the Science and Engineering Council who had been partners since the early 1960s in the Student Apprenticeship Scheme, were very keen to retain the scheme. This with the certain knowledge that a few years would bring a rising tide of retirements at all levels, with urgent demand for replacements, it remained imperative that the scheme was kept in being and capable of expansion when the need arose.

During this period Mr P Bowles, who had been associated with the Harwell Apprenticeship Scheme in his days as a senior engineer at Harwell, was setting-up the engineering organisation of the NIRNS (which subsequently became Rutherford Appleton Laboratory). He had insisted that NIRNS apprentices should be trained within the Harwell Scheme. This preserved the form of the well established and structured Student Apprenticeship Scheme. In addition it remained possible to recruit engineering graduates direct from university and make use of some of the Apprentice Scheme expertise to provide a balanced programme of post graduate practical training so that replacements could be found more quickly while the original scheme or some suitable alternative was being established.

CHAPTER 4

EARLY PRACTICAL TRAINING

Before even the first apprentice arrived at Harwell, considerable thought was given to equipping the Training Workshop and to devising a programme of work which each boy would follow. Inevitably, the choice of equipment was a compromise between what was desirable and what was available that could be fitted into the limited accommodation which had been allocated for the purpose. Strangely enough the final outcome proved to be very fortuitous and the balance achieved by having four lathes, two milling machines, a shaper, a surface grinder, two drilling machines, a bandsaw and a brazing hearth for a group of twelve or thirteen boys would be repeated equally successfully again and again with subsequent expansions of the scheme.

The choice of programme was made after many lengthy discussions and visits to Woolwich and Farnborough training schools. One view was that a series of test pieces could be designed to incorporate the basic lessons which were to be taught. The opposing view was that each boy should make and ultimately retain a selection of small tools which would embody in their design most of the essential lessons and would enable as many of them as possible to be learned in the course of their manufacture. Today it is even more obvious than it was then that the second alternative was the right choice, because it gave the apprentice an added incentive to do his best. It was not always easy for an instructor to remember that the tap wrench, for example, was an exercise in taper turning. Although its efficiency as a tap wrench would not be affected if the tapers at each end did not quite match, it was certainly an indication of the pupil's lack of understanding of the principles of taper turning, and in fact called for the work to be scrapped and attempted again after further instruction. Similarly many an Instructor who chanced upon a far superior design for a pair of clamps or some other item, was brought up with a jolt when it was pointed out that the suggested design contained none of the lessons which were taught in the making of the existing item.

It was quite remarkable that the first group of apprentices in particular, reached the high standard of practical proficiency they did, because the difficulties they faced in grasping the instruction were as nothing compared to those faced by their instructor in presenting it. Mention was made in the opening chapter of the fact that when the first group of thirteen apprentices started, there were only benches for eight of them, so when instruction was being given to those eight, five other inquisitive inexperienced and unsupervised apprentices were endeavouring to determine the function of each switch and lever on the highly interesting group of machines at the far end of the workshop. When the first eight were able to occupy themselves filing chunks of metal which hopefully would become G-Clamps, a further three were detached to learn some simple turning on the three smaller lathes, but of course the discovery of a broken shear-pin or jammed gear box, resulting from their earlier explorations, would disrupt this bit of careful planning.

With this setback overcome and the last two boys about to start work on the milling machine and the shaper, the outlook seemed hopeful until it became apparent that the first group were now wanting to know what to do next, having miraculously completed two hours work in about ten minutes by assuming that a few abortive rubs with a file had reduced their rough lumps of metal to a degree of accuracy and a standard of finish which would be acceptable to their instructor.

The problems for all during those first few months sowed the seed of future efficiency and all subsequent groups were started as a class on benchwork and picked off in small units for training on machines only when they reached a certain level of proficiency.

Towards the end of that first training year, as selection of the second intake of apprentices was under way, arrangements were also being made for the subsequent training of the first group who would be leaving the training shop at the end of August 1949. At that time most of the manufacturing work at Harwell was carried out in the Main Workshops in Hangar 9 although small support, or laboratory workshops with two or three craftsmen and a few machines were attached to most Divisions on site. Larger workshop units had been created for Site Maintenance and Electrical Maintenance, and subsequently Special Plant Maintenance in Hangar 7. Other workshops dealing with maintenance and experimental and development work were also being created in Pile Engineering Group which would ultimately become Research Reactors Division, so there was ample scope to provide the specialised training and experience which would be a vital part of the Apprenticeship.

After reviewing the needs, and the facilities available, the Apprenticeship Board decided that most Craft Apprentices should spend their second and third years in Hangar 9 where, due to its size and the volume of work passing through, it would be more easy to control the range and degree of difficulty of work issued to apprentices. As Hangar 9 Workshops was sub-divided into Turning, Milling, Fitting, Instrument Making, Toolroom, Sheet Metal and Welding Sections it was relatively simple to develop a sensible programme, and again because of its size apprentices could benefit from the experience of working with the wide range of craftsmen it was possible to place them with.

A similar programme was developed for the Student Apprentices but as some of them could well be going to University at the beginning of their third year, it was much compressed, and in addition, arrangements were made for them to spend a few weeks at a small foundry at Compton to acquire some appreciation of this important engineering process. At this efficient though primitive little foundry the main product appeared to be thousands of frames for theatre and cinema seats and as there was little or no evidence of mechanisation they really learned the process the hard way; the only compensation for the discomforts of this heavy and dirty work was the novel experience for them of travelling to and from Compton each day in a car driven by a uniformed lady driver.

One of the highlights of the Apprentice Training Scheme year is undoubtedly the Annual Prizegiving and early November 1949 saw the first such occasion, but a much more modest event than those which are now the custom. Thirteen apprentices and about the same number from the Apprenticeship Board and Staff assembled in a small conference room in Building 329 to hear the Chief Engineer Mr Harold Tongue give a short address and present the prizes to Craft Apprentices Eric Hailstone and Harry Isaac and Student Apprentices Bob Cope and Dave Elliott. The prizes were paid for from a fund approved by the Ministry which enabled "£1 to be set aside annually for prizes for every four apprentices in the Scheme", so the princely sum of £3.25 was available for the above four prizes. The rigid entertainment regulations of that period were relaxed sufficiently to enable the canteen to provide tea and biscuits for all present. That Prizegiving is also noteworthy because the first Special Award was introduced then and has been awarded continuously ever since.

At that time each apprentice could only retain the tools he had made during his

first year, on payment of 17/6d (87½p) for the material used. Mr George Peck one of the Workshop Representatives on the Apprenticeship Board made it known that members of his union (then the AEU) wished to pay this 17/6d each year for the best Craft Apprentice and this award would be known as 'The Craft Tools Prize'. The nature and value of this award has changed over the years but it still can only be won by an apprentice displaying outstanding craftsmanship. The continued existence of this award serves as a reminder of the part played by the local Craft Unions in establishing at Harwell a scheme with the highest standards, retaining the best features of the traditional relationship between the Master Craftsman and his Apprentice.

During the following year many improvements to the training programme were introduced and consolidated as a result of the lessons learned from the mistakes of the first year. A part-time Assistant Instructor, Bob Wakeley, was appointed to help during the busiest periods in the Training Workshop thus enabling Mr Wallace to liaise more easily with the apprentices who were now in Main Workshops. When the third intake arrived in September 1950 the post was advertised as a full-time Apprentice Instructor and in November Mr Wakeley was appointed.

At this time also Mr Ken Dickinson, the Labour Manager, left Harwell and almost as he departed his successor Mr John Wilcox-Baker arrived and immediately took an intense interest in the Apprentice Scheme. As a relatively new entrant to the Civil Service, John Wilcox-Baker had certainly none of the inhibitions usually attributed to the traditional Civil Servant of that period and indeed he quickly established a reputation as an innovator of unique and even revolutionary ideas. Over the next ten years no section at Harwell felt the impact of this more than the Apprenticeship Scheme, probably because it too was relatively new to the Civil Service with the guide lines just being drawn and little in the way of established custom and practice. Ultimately he and his staff took over the Secretaryship of the Apprenticeship Board from Mr Dennis Mettrick; a logical development at a time when an increasing amount of the work was related to conditions of service, recruitment and ultimate placement at the end of training.

In 1947 when this Board was first established, Dennis Mettrick was appointed Secretary and it was fortunate for the Scheme, that in spite of all his other work in a rapidly expanding Drawing Office, he was able to continue for the next six years when the main problems concerned practical training, workshop equipment and the rapidly changing course of technical studies; all spheres in which his knowledge and experience were to prove invaluable, thus enabling the main framework of training and education to be established before the change was made.

By the end of 1950 it was becoming apparent that an annual intake of six or seven Craft Apprentices was going to fall far short of meeting the needs of the rapidly expanding workshops. It was already recognised that one or two boys would probably qualify for regrading to Student Apprentice while some others would certainly meet the requirements for regrading to Drawing Office Apprentices, with the result that from the first two groups, only about half would be placed in mechanical or electrical workshops. By mid-March 1951 it had been decided to convert another annexe in the North-east corner of Hangar 9 into a second training workshop and it says much for the priority given to the project that by early September it was fully equipped, an additional instructor, Mr Wilf Ceasar, had been appointed and everything was ready to receive the new intake of 15 Craft Apprentices, 6 Student Apprentices and for the first time one Graduate Apprentice.

CHAPTER 5

THE YEARS OF CONSOLIDATION

The five or six years following the opening of the second training workshop were probably the most important in the early history of the Harwell Scheme. At the beginning of this phase AERE was still a Ministry of Supply Establishment and the Apprentice Scheme was one of the youngest; while only a few years later when first the Department of Atomic Energy and then the UKAEA was created, Harwell was not only the oldest in that Department, but had already established a national reputation which brought visitors from near and far to study the training methods.

The first steps along this road were taken in 1952 when a competition was introduced to select the best entry from a first year apprentice at each establishment. The winning competitor was to receive the 'Tom Nevard Memorial Cup' this had been given that year to commemorate the outstanding contribution made by the late Tom Nevard of Labour Branch in establishing the highly successful Apprenticeship Schemes which were by then operating at thirty-one MOS Apprentice Schools and catering for over 500 first year apprentices. The minutes of the Headquarters Apprenticeship Committee for December 8th 1952 record that "the three independent judges spent approximately two days on the judging. In spite of the wide variety of items entered and the extremely high standard of each they agreed independently and unanimously that item 21 should be awarded the cup --------- Only then were they made aware of the identity of the successful apprentice and his establishment, namely M J Newland of AERE Harwell".

So only four years after its inception and much to the surprise of many older establishments, the Harwell scheme gave the first indications that it was going to be something exceptional. At the beginning of Chapter 4 the reasons for basing the practical training on the manufacture of a set of small tools were discussed and in common with most other MOS Establishments Harwell had adopted this policy, indeed, all the drawings had been obtained from other Apprentice Schools. At the start of the 1951-52 year the entire content of the programme of practical training was reviewed to determine its worth, and a number of items were discarded, others redesigned and some entirely new ones introduced. As a result of this review, a number of fundamental rules were evolved which altered the whole approach to practical training because it was recognised that in the past much of the instruction had been along the lines of a hobbies class at junior school where the boy is helped and encouraged to make the best "dust pan" or "screwdriver" that he can. The main points to emerge were that an item should only be included in the programme because of the value of the lessons to be taught in the making of it, and not because of its usefulness as a tool. The lessons should be clearly identified by the Instructor and made known to the Apprentice and to avoid the risk of placing the emphasis on producing a good tool and forgetting the lesson, suitable checks should be introduced to assess his understanding. As a result of this approach the standards of accuracy and finish were raised considerably, and somewhat surprisingly were attained quite readily by most of the apprentices who gradually got round to thinking of each completed job as a test of their understanding of a series of manufacturing processes.

In consequence, the item selected for entry in the Tom Nevard Cup competition was of a very high standard and reflected this different approach to training in true craftsmanship, and it is not without significance that in the report they issued the judges said:-

"------- the Examiners would draw the attention of all concerned to what was felt to be a common error, namely a tendency to spoil entries by leaving small faults which would interfere with the functioning of the apparatus. It might be added that some of the screw threads were major items where points were lost. It was noted that certain items dropped points owing to lack of smoothness in operation and also to errors in overall dimensions".

It will be appreciated that where the lessons are really learned and applied then by definition those errors should be nearly non existent.

At this time the Department Training Office of the MOS had been running a number of training courses at TRE Malvern for Apprentice Instructors, and the custom had been established for a Chief Instructor or Apprentice Supervisor to be invited to give a talk during the last session on the Apprentice Scheme at his Establishment. Following Harwell's success in the Nevard Cup competition, Harwell was invited to give this talk for the next year. The Harwell talk included a section on the selection of items for the training programme and on the basis of the identification and value of the lessons incorporated in their manufacture, but took the logical step of pointing out that the end product of a training scheme should not only be a set of tools, but an 'Acceptable Employee'. This term was defined as applied to apprentices, and outlined the part all Instructors could play in producing them.

A hand-out which accompanied this talk defined the three main facets of the 'Acceptable Employee' as follows:-

Practical Ability

The ability to perform an allotted task:-

To an acceptable standard

In a reasonable time

With the minimum of supervision

Technical Ability

Reaching the highest standard he is capable of achieving

Citizenship

Honesty
Pride of Workmanship
Co-operation
Respect for Authority
Self Reliance
Community Spirit

Although the audience had been spending a week learning how to improve their practical instruction, they readily accepted that the personal qualities of an individual probably had the most influence on his success or failure and the best craftsman in the country would have little value if he could not be relied upon or, if his personality aroused friction and dislike among all his workmates. It was emphasised that during the transition period from schoolboy to adult craftsman the Apprentice Instructor would see more of the apprentice than his parents would and in consequence their example and influence would play a large part in determining the type of citizen he became in addition to his ability as a craftsman.

Little of this was new and to a large extent reflected the attitudes of the Harwell Apprenticeship Board and Management, but at a time when there was a tremendous upsurge in training, with many complete newcomers in the field it all helped to promote the enthusiastic discussion which enabled the Harwell scheme and others like it to flourish as they did. Mr D N Lawton the Department Training Officer and Mr Whitby the Industrial Education Officers were both at the training course at Malvern and felt that this talk seemed so appropriate for the course that they asked Mr Wallace who gave the talk to return on some future courses and indeed at a later date recommended Harwell's knowledge to ICI when they subsequently ran similar courses for their Apprentice Training Staff.

During this time too, as each new Atomic Energy Establishment introduced its own Apprentice Scheme, the newly appointed training staff frequently spent some time at Harwell to glean as much information as possible, just as Harwell had done with Woolwich, Farnborough and Malvern in their early days. This not only put Harwell in the position of trend setter but ensured that the training staff there kept abreast of all the latest developments in their anxiety not to be outdone by any of the newcomers.

As the total number of apprentices at Harwell grew, and the older ones began to display more maturity, increasing opportunities arose for them to organise some of their own sports and social functions and the logical outcome of this was the birth of the Apprentice Association in 1952 just about a year before the first group completed their apprenticeship. More will be written of the Association's activities later but at this stage it is probably sufficient to say that over this period they did much to give the Harwell Apprenticeship Scheme a tradition and status which it has retained since. One of the highlights was the very first "End-of-Time" Dinner which was one of the outstanding functions of the Harwell year and gave the completion of their apprenticeship some of the dignity of a Graduation or a Passing out Parade. During this period too apprentices made their presence felt in other ways. A Scout troop and Cub pack had been set up at Harwell for the children of employees and as this was in the days before Senior or Venture Scouts, many of the Student Apprentices and Scientific Assistants resident in the hostel formed a Rover Scout Crew which, for some time, was one of the largest and most active in Berkshire.

Most of the Craft Apprentices lived at home but the majority of the Student Apprentices were housed in a hostel which had once been a NCO's mess, and during those initial years their numbers were growing annually. Conditions were fairly spartan in this post-war period of continued rationing and shortages and unlike the residents in other hostels, the apprentices and SA's had little spare cash to contribute to the type of amenities fund which in the other hostels provided newspapers, magazines, radio-gramophones (the forerunner of hi-fi) and ultimately television sets. Even the bedroom furnishings were very much war-time utility standard issue, and when the boys' pleas for some improvement apparently produced little response, it gave birth to one of the more unique protests of that period. Portway House, the Apprentice Hostel, was quite close to, and visible from Sir John Cockcroft's house in South Drive, and when he looked out one morning to find the word "CLINK" facing him, painted in white letters about five feet high on the roof of the hostel, he was, to say the least, perturbed. Within minutes, in his quiet, meticulous way he was seeking the true reasons behind this tricky midnight mountaineering escapade. Sir John had always insisted that as Harwell was transformed from a war-time aerodrome it should finish up looking like a Research Institute and not like a factory; comparison with almost any other Authority Establishment makes the fruits of this policy quite apparent.

Fortunately for the apprentices his attitude to the well-being of staff was equally enlightened and when he was faced with the "hawks" who wanted the heads of the young hooligans who had no respect for property, and the "doves" who maintained that given an attractive place to live in they would respect it, he chose the latter course and approved an extensive programme of improvements to the furnishings and amenities of the hostel.

As the first groups of apprentices completed their training, it became increasingly obvious that their numbers were falling woefully short of the needs of the establishment and in most cases their services were lost for a further period while they completed compulsory National Service, a requirement which was to continue until 1960. The merits of conscription continue to be argued today but in the long run few of the apprentices affected really resented it, for in addition to the way it developed confidence and self-reliance, most Harwell ex-apprentices passed the initial trade test at a very high standard and were posted to technical units where they added something to the skills they had acquired at Harwell.

CHAPTER 6

UNDER NEW MANAGEMENT

During the first five year cycle in apprentice training, the composition of the Harwell Apprenticeship Board had remained remarkably stable when one considers the vast expansion which was taking place at Harwell and the resultant changes which were being made to the normal duties and responsibilities of many of the members. This stability encouraged long term planning and together with the widely varied backgrounds of the Board members was undoubtedly a major factor in the moulding of one of the outstanding training schemes of that period. One change however must be remarked on, as mentioned in 4.2 was the replacement of Mr Ken Dickinson by Mr John Wilcox-Baker as Labour Manager towards the end of 1950. This introduced an ebullient character whose unconventional and imaginative approach was to have a marked influence on Apprentice Training in the Authority as a whole, but most particularly at Harwell where he started, and ultimately at Risley to which he transferred in 1959. As his Industrial Relations Section grew in size and the numbers of staff increased, Mr Wilcox-Baker played a growing part in the formulation of training policy, particularly in the areas of recruitment and selection, technical studies, liberal studies, and extramural activities.

At the end of 1953 when the pressure of his own duties compelled Mr Mettrick to relinquish the post of Secretary to the Board, Harwell, in common with other establishments, made this one of the functions of Industrial Relations Branch. Mr Mettrick continued as a most valuable member of the committee for a further three years at which point he felt that as his duties had now diverged so widely, he should relinquish his place in favour of someone more directly involved in the training and employment of Drawing Office Apprentices, although he retained a very close interest in the scheme until his retirement. When John Wilcox-Baker assumed the Secretaryship, the opportunity was also taken to appoint one of his Labour Officers to the Board with responsibility for the functions of recruitment, extramural activities etc., mentioned earlier. From then until 1960 this was to introduce a series of widely differing personalities, Eric Symonds, Margaret Evans, 'Toby' Dawson, Len Walker and Elliot Cave, who were to leave their imprint on the scheme to a far greater degree than might have been expected in the relatively short period each of them served, although the reasons for this were partly due to the way in which they helped the Scheme adjust to other major changes which were taking place during this period.

When this chapter opened, Harwell was starting to sever the links with the Ministry of Supply and begin a brief period as part of the Department of Atomic Energy, which in turn became the United Kingdom Atomic Energy Authority in August 1954. The MoS Apprenticeship Scheme had served the Atomic Energy Establishments well, but inevitably some of the central organisation which had been used in the past would no longer be available and in consequence new procedures would be needed to deal with such matters as Student Apprentice selection, University Scholarships or inter-establishment competitions. It was only natural that, with the UKAEA assuming responsibility for those and other facets of training policy, the opportunity should also be taken at this time to examine the scheme and ensure that it was in fact meeting the needs of the Authority establishments. One of the first steps was to set up an advisory committee under the chairmanship of Mr John Lloyd, OBE, Chief Labour Officer for the UKAEA. The Research Group, Weapons Group and Industrial Group which were then the three divisions of the newly formed Authority, each nominated some three or four members, usually including the Chairman of each local Apprenticeship Board, the Group Labour Manager and the Apprentice Supervisor.

Initially this committee did much useful work, but gradually its influence declined as each Group was given greater autonomy in the fields of recruitment, selection, sponsorship etc. While it lasted, central selection of Student Apprentices was always a source of friction between the Groups, because Research Group was most often the first choice of the top applicants in the annual entry competition as even in those far off days, Industrial Group and more particularly Weapons Group had a less attractive public image.

About this time Harwell made a significant contribution to this review of the Apprentice Scheme when Mrs 'Toby' Dawson and John Wallace under the editorship of John Wilcox-Baker submitted a report entitled "An Investigation into Apprenticeship Schemes, in Six Major Concerns, with some Recommendations after Comparison with the Authority's Scheme". The six major concerns were, Rolls Royce Ltd., British Thomson Houston Ltd., Metropolitan Vickers Ltd., Napiers Ltd., ICI Ltd., and The General Electric Co. Ltd. The companies were selected because all had engineering staff requirements very similar to those of the Authority and during this period all six were recognised as front runners in the field of industrial training. The report was not an unqualified success, as London Office Central Management were not prepared to implement any of the recommendations without further investigations, and seemed inclined to the view that submission of the report implied some criticism of their handling of the development of the scheme following its transfer from MoS. They were moved however to appoint a very senior committee "to examine the present Industrial Apprentice Scheme" and this committee re-examined much of the ground covered in the Harwell report and indeed revisited two of the above firms, but in addition also visited British Rail at Crewe and English Electric at Stafford. In their report published about a year later they did in fact endorse many of the Harwell report recommendations, particularly those seeking higher entry qualifications for Student Apprentices with a view to ensuring that most should attain professional qualifications by the end of their apprenticeship.

Strangely enough both reports made recommendations which never were implemented when they each proposed an additional stream with separate entry for Drawing Office and Technician Apprentices. With hindsight most of those involved would be glad this was not done, for experience has shown the value of leaving the door open for trainees to go as far as they can, rather than labelling them too soon and missing some from the lower streams with the ambition and drive to rise higher, or on the other hand facing the problem of what to do with a trainee from a higher stream who fails to reach the required standard and yet would have a massive chip on his shoulder if he were demoted.

Although it was recognised that professional qualifications should be the objective for the Student Apprentice, it took some years to reach the position where all selected candidates were guaranteed sponsorship on a course leading to this. Initially all UKAEA grants were discretionary but it soon became apparent that, if an applicant was already qualified for a place on a degree or diploma course, neither he nor his parents would be satisfied with a vague promise of consideration, when in fact they could have an immediate guarantee of financial support either from another firm or by virtue of a county award. For the Authority to compete with other organisations seeking the most promising applicants, it became necessary to confine selection to candidates already satisfying University entrance requirements. This meant there was no longer a place for the young man who previously had completed those requirements during the first year of his apprenticeship. When it came, this big step was welcomed by all but until then each change in the Student Apprentice Scheme had brought its own crop of new

problems and as will be seen in due course, this apparently enlightened decision was to prove no exception.

This period of transition to and growth as an independent authority brought in its train extensive changes in organisation and staff at Harwell which in turn introduced new faces and influences to the Apprentice Scheme. The retirement of Harold Tongue as Chief Engineer enabled Harwell to pay tribute to him by presenting a cup in his name to be competed for annually by UKAEA apprentices on similar lines to the Tom Nevard Cup competitions for which they had been eligible while part of the MoS. Over this period too, the deputy Chief Engineer, Mr Percy Bowles took a very close interest in the scheme with the result that in March 1957 the Apprentices and their work were featured as one of the important facets of Engineering Division during the visit to Harwell of Her Majesty The Queen and The Duke of Edinburgh. At a later date on taking up the appointment of Chief Engineer at NIRNS (later the Rutherford Appleton Laboratory of SERC), Mr Bowles was to play a large part in getting agreement for the training of their apprentices to be carried out under the auspices of the Harwell Scheme.

On the debit side, one of the founder members of the Board, Mr R F Jackson, felt compelled to relinquish his membership but he kept closely in touch with developments through Mr Sam Waldron whom he nominated to succeed him and a few years later when Bob Jackson himself became Chief Engineer at Harwell, it was quickly apparent that he was still a well-informed and staunch supporter of the scheme. Even the immediate training staff did not avoid change at this time for in the space of a few years both of the early instructors had gone. Wilf Caesar went on promotion to Aldermaston, outside of the training field, but as will be seen, returned at a later date to his first love as an Advanced Training Instructor. Bob Wakeley accepted an appointment as an Apprentice Supervisor in outside industry and some time later was an active regional officer in the British Institute of Training Officers, a rapidly expanding organisation during this period of the training boom. This was the first indication that Harwell's contribution to training would include the development of experienced staff as well as apprentices.

The replacement instructors were both destined for important roles in the scheme and eventually their names would be known to hundreds of ex-apprentices throughout the world. George Wood was ultimately to become Apprentice Manager of one of the largest and best equipped Apprentice Schools in the country at AEE Winfrith and Harry Wells was to continue at Harwell and during the training explosion of the next few years as Apprentice Supervisor, was to help develop one of the most complex and efficient Advanced Training Schemes, help commission a vast new Apprentice School and eventually take over as Apprentice Training Manager from John Wallace on his retirement, but much of that was then some way in the future. The most immediate problem facing Harwell at that time was some vague and indeterminite thing known as "The Bulge".

CHAPTER 7

THE 'BULGE' AND ITS IMPACT

At the end of the war in 1945 and for several years thereafter the birth rate in this country increased very rapidly with the result that a similarly increasing demand for school places and school teachers could be forecast; first for primary schools around 1950 and gradually working through to Secondary Schools and Grammar Schools in the late fifties and early sixties. This "Bulge" as it came to be known would obviously begin feeding into the labour market by those final dates and many reports were written and many discussions held on how to cope with this massive influx of young people to industry and commerce.

To the Apprenticeship Board at Harwell this was not a new problem but rather an extension of a problem with which they had been wrestling almost since the inception of the scheme. The rapid expansion of Harwell had created a demand for skilled craftsmen which the output from the local scheme could not fill and the promotion of many of the best of the existing craftsmen to supervisory grades in the new or expanding workshops had accentuated the problem. The intake of Craft Apprentices had been trebled to eighteen in 1951 but this had only scratched the surface of the problem and the Apprenticeship Board, aware of Government exhortations to provide additional training places to cope with "The Bulge", intensified their attempts at getting approval for a further expansion of the scheme. By this time accommodation at Harwell was at a premium. All existing ex-RAF buildings were already in use or in the process of being modified, and many new buildings were under construction or being designed. With three or four reactors at various stages of design, construction or commissioning; a cyclotron being built and a whole range of supporting services and research teams being assembled to cope with all this miraculous plant, it will be readily recognised that plans to increase the number of apprentices could hardly be expected to head the list of priority projects at Harwell under the circumstances.

It is a remarkable tribute to the quiet tenacity of Mr Marchbanks and the Apprenticeship Board members under his chairmanship that by early 1956 architectural sketches had been submitted, for a £48,000 building, outline approval had been obtained, discussions on a suitable location were under way and estimates for some of the machine tools were being obtained. It was all the more disappointing for them when they were suddenly informed that the scheme could not go ahead for that year and indeed plans for an expansion of the scheme at Harwell were being shelved for the time being. It was little consolation that this restriction on expansion was directed at Harwell as a whole and not just at the Apprentice Scheme. At a meeting of the Apprenticeship Board in March 1956 it was explained that the UKAEA Executive had decided that a restriction must be placed on the rate of expansion and ultimate number of employees at Harwell because of the pressure which was suddenly being imposed on the services and amenities of the surrounding towns and villages due to the influx of Harwell employees and their families. It would become Authority policy to create new centres away from Harwell to cater for the expansion of selected projects and at a subsequent meeting of Group Secretaries, confirmed the decision to halt the immediate expansion of the Apprentice Scheme at Harwell but suggested that it may be possible to increase the number of Craft Apprentices in the future, either at Harwell or elsewhere, when re-organisation had taken place.

This then was the situation through 1956 to 1957 and in January of that year when John Wilcox-Baker, 'Toby' Dawson and John Wallace published their paper, with the

recommendations already referred to, it seemed unlikely that any of them would be applied in a big way at Harwell. Indeed, when the one hundredth meeting of the Apprenticeship Board was held in February 1957 the occasion was marked by the Chairman reporting that he had received a letter from Dr Schonland stating that he very much regretted that it would not be possible to approve any increase in the number of apprentices to be recruited in 1957.

A further item in the minutes recorded that Manufacturing Group of Engineering Division were anxious to reclaim the accommodation in Building 9 at present being used for Apprentice Training, so the Board were urgently seeking some 4,000 sq ft of workspace in Building 354 just to keep the scheme going although there was some doubt abouts its availability.

Nevertheless, in spite of those gloomy tidings there was always an underlying confidence that with skilled craftsmen in such demand and with a growing army of school leavers seeking training, the Apprentice Scheme was too important for its future to be placed at risk. Certainly none of this despondency was apparent in either the enthusiasm or achievements of the existing apprentices so it seemed almost more than coincidence that the excellent little exhibition they put on for the Royal visit in March should mark the turning point in the fortunes of the Scheme.

Many signs of the re-organisation forecast by Sir Donald Perrott were already apparent; RCC Amersham was developing steadily; the Engineering and Electronics Unit at Bracknell was well established; discussions were in hand to determine the location of the new site which would untimately be AEE Winfrith, and the publicity surrounding the "ZETA" experiments had made some form of 'fusion reactor' an apparently imminent source of unlimited power, but more realistically had just opened up a vast research programme which would ultimately need to be housed in a place on its own. But the one feature of the re-organisation which was to have the greatest impact on the Apprentice Scheme was the arrival from AWRE Aldermaston of John Dolphin to become Engineer-in-Chief of the rapidly expanding Research Group at Harwell. He was certainly a colourful and dynamic personality and was surrounded by legends of his inventiveness during the war, all of which helped to establish him as an object of hero worship among the apprentices. He had been renowned for the interest he took in Apprentice Training at Aldermaston and the move to Harwell did nothing to lessen this, indeed in view of the range of his responsibilities, it was amazing how much of his time he found able to devote to the organisation of the scheme even to the extent of being conversant with the progress of almost every apprentice.

Within weeks of his arrival he had made himself familiar with the scheme at Harwell and was already looking for ways of expanding it. By October 1957 he had decided to take over Chairmanship of the Apprenticeship Board himself and when he attended his first meeting that month he was in a position to place before the Board members a scheme to set up a new Apprentice School at Winfrith with a proposed intake of 60 boys a year. By moving all first year training to Winfrith and taking account of the fact that most Student Apprentices spent at least three years at College or University, it would make it possible to increase the number of Craft Apprentices for Harwell without any actual increase in the numbers to be counted against the Harwell complement.

Because of such problems as recruitment, school leaving dates, and enrolment to Technical College courses it is imperative that a new scheme starts in the September of any year, but when the Board discussed those proposals, Mr Dolphin

must have been the only member who saw even the faintest hope of them being realised in September 1958, only eleven months hence. Be that as it may the hostel, "Egdon Hall" was opened by the Mayor of Weymouth on the morning of 25th September 1958 and when the Apprentice School was opened by John Dolphin himself on the afternoon of that day it was the first operational workshop to be commissioned at Winfrith. Some work still remained to be done, particularly in the lecture hall and gymnasium which formed part of the training school complex, but the training staff had all been appointed so apart from a few hiccoughs, the full training programme was quickly underway.

Meanwhile, at Harwell other developments were afoot as schemes were considered to resolve some of the problems which had been arising as a result of the increasing number of apprentices being placed in site workshops for training and experience during the final four years of their apprenticeship. The problem was twofold; as the numbers involved grew to about eighty it was proving increasingly difficult to find sufficient spare machines, working space or even skilled tutors in many of the workshops which were available for training. Secondly the very wide range of work being carried out in many of the workshops was not always as advantageous as one might expect because it was impossible to predict that an apprentice would in fact be given experience in certain specialised skills in his trade merely by attaching him to the workshop where this work was occasionally done. The solution to both problems was obviously to set up an Advanced Training Workshop where third or fourth year apprentices could spend about six months on carefully selected projects for the establishment under ideal training conditions. During the summer of 1958 this workshop was established with Wilf Caesar returning as Instructor and was an immediate success, with him soon being offered so many valuable projects that he could afford to be quite selective, and fortunately management always upheld his right to turn down any projects not having suitable training content thus ensuring that the workshop was not used as a source of cheap, unskilled, repetitive work.

The changes in the structure of the scheme brought about some changes in the composition of the Apprenticeship Board also. The involvement of Winfrith made it necessary to include some members from management there, so to retain a balanced board without it becoming unwieldy, some reductions and changes in the Harwell representation proved necessary. Mr Marchbanks continued on the Board for some months after Mr Dolphin became Chairman but in the next major reshuffle he stood down in favour of Mr Jim Southern who had joined Harwell from British Rail some time earlier to be responsible for the manufacturing side of Engineering Division and had become increasingly associated with a number of Authority committees on the selection and training of young professional engineers and Student Apprentices. Although not appreciated then, the introduction of Jim Southern to the Board was to begin a long association with the scheme which would ultimately see him as Chairman of the Board until his retirement, spanning many of the most successful years and revolutionary developments in its history.

It was always with a sense of loss that the Board saw some of its old and valued members replaced by new faces but it was remarkable how well many of those ex-members continued to serve the scheme long after their departure. Many who took over new departments used this opportunity to provide new training outlets for apprentices, while others who rose to the highest levels of the UKAEA executive made sure that the best interests of the Apprentice Schemes were never overlooked. This was equally true of the workshop and trades union representatives on the Board, many of whom were themselves outstanding craftsmen who could offer much in the development of the training programme and it was no mere accident that at least three of them eventually joined the training staff at Harwell and Winfrith.

CHAPTER 8

WINFRITH

With the opening of the Apprentice School at Winfrith, training in the Research Group entered a completely new phase and as one of the largest and newest apprentice schools in the country, it was certainly a centre of interest and practically an essential visit for any firm contemplating the introduction of a similar scheme, so it is probably worth looking at some of the features which made it unique.

The entire project cost about £250,000 then and this was divided fairly equally, i.e. about £80,000 each between a) the fully-equipped hostel at Weymouth for about 50-60 boys with a self-contained warden's flat, b) the school building comprising workshop plus assembly room/lecture theatre together with a purpose built gymnasium, and c) the machine tools and all the equipment for the workshop. After experiencing the difficulties of running a small apprentice hostel at Harwell it was decided to appoint the YMCA to manage the Winfrith hostel, particularly as most of the residents would only be sixteen or seventeen years old, and for most it would be their first time working and living away from home. The prestigious and popular choice for first warden of the hostel was the one time captain of Arsenal and England football teams, Eddie Hapgood, who with his wife tried to ensure, with a fair degree of success, that this group of virile young men worked, studied and behaved themselves while living in a town which for most of the year was a popular South Coast holiday resort.

The staffing arrangements at the Winfrith training school were the subject of much discussion and heart-searching but the chosen structure, which originated accidentally at Harwell is fairly unique and is almost certainly one of the main reasons for the intense loyalty to be found among ex-apprentices and explains their anxiety to retain their links and display their pride in being Harwell trained.

In most apprentice schools of comparable size, separate sections are established for turning, milling, fitting etc., each under a specialist instructor, so that during the course of their training, apprentices spend some weeks or months in each discipline, moving from section to section and instructor to instructor. When the Harwell scheme was started, initially for twelve boys, it was a self-contained unit, housed in a small workshop in Building 9 with one instructor responsible for all tuition on hand and machine tools throughout the first year. When the intake was doubled, no suitably sized workshop was available, so a second self-contained and virtually identical workshop was established under a second instructor at the other end of Building 9. It was not immediately recognised that in this situation the instructors were going to exert tremendous influence on the development of the young new entrants to industry who were struggling to make the transition from schoolboy to adult employee. In most cases the instructor would spend more time with the apprentice than the boy's parents would during that first year at work, so it is not surprising that to many of his trainees the instructor would become guide, mentor and father confessor, a relationship that often continued long after the boy had left his immediate jurisdiction and which was to play a big part in establishing Harwell's reputation for turning out responsible citizens as well as competent craftsmen.

When the Winfrith school was being planned, a strong case was made initially in favour of the system of specialist instructors, as this would give more efficient machine usage and would require less space, fewer machines and in theory should

result in better instruction. The priorities of the Apprentice Board members however are apparent in their decision to adopt the system which had evolved at Harwell, in preference to the one which on paper would have been more advantageous in terms of efficiency and costs, and the achievements of ex-apprentices over the years is a convincing endorsement of their choice. The outcome was that the Winfrith first year training school was designed round five Instructors each with twelve apprentices, all of whom remained with their Instructor for the whole of their first year. Effectively there were five separate self-contained units with each Instructor taking his own group of apprentices through from elementary bench work to turning, milling, grinding, fitting and assembling. This meant that each apprentice followed the same ideal sequence of instruction and soon acquired the pride and loyalty of belonging to an elite class under a particular Instructor and almost certainly was quite confident that his group and his Instructor were undoubtedly the best in the school. It may not have been the most cost effective system of training but it went a long way towards producing craftsmen who were prepared to give of their best whether supervised or not, and who recognised the importance of fitting in with others as a member of a team.

At Harwell the success of the Mechanical Advanced Training Workshop paved the way for the addition of an Electrical Advanced Training Workshop which had proved necessary as a result of the growth of electronics, instrumentation and control engineering and it was not long before two similar workshops were established at AEE Winfrith to provide advanced training for their locally recruited apprentices who of course continued their training at Winfrith after the other first year boys returned to their parent establishments.

Not content with the problems of commissioning a new school, John Dolphin agreed at this time to accept the transfer of a number of apprentices who had become redundant at the Portland Dockyard. This move enabled a number of senior apprentices to be recruited with the result that a small number of additional craftsmen became available at an earlier date. A similar exercise was carried out a year or two later with redundant apprentices from Handley Page Aircraft in Reading.

Shortly after the Winfrith school opened, John Dolphin had occasion to visit the firm of Societe Genevoise in Geneva and was so impressed by their apprentice scheme that it was arranged for Jim Southern and John Wallace to make a visit there. This firm were manufacturers of outstanding high precision machine tools and the remarkable feature of their scheme was that three years and two months of the four year apprenticeship was spent in the Apprentice School and few, if any, of their apprentices failed at their first attempt to pass the obligatory Government trade test. The reasons given for this apparently costly system of training were that their objective was to ensure that each generation of craftsmen they produced was better than the previous one and this could only be achieved by highly organised training which did not rely too heavily on the hit or miss system of the boy being placed alongside older craftsmen. The lessons learned here helped to speed the introduction of Advanced Training Workshops but many of them were not fully applied at Harwell until the apprenticeship in Britain was reduced from five to four years some time later.

It would seem that the vast improvements and additions to the Research Group scheme which had taken place over this period would have produced an ideal set up which

could then remain unchanged for years, but this was certainly not the case, as the Student Apprentice Scheme in particular began to throw up new problems. Each establishment had been given greater autonomy in the selection and training of Students in 1959; entrance standards had been raised and virtually every student could gain sponsorship on a full time Engineering Degree or Sandwich Diploma course at University or College. The outcome of this was the Students for Harwell departed for college very shortly after completing their first year training at Winfrith with no knowledge of the Harwell establishment and a far from intimate relationship with the staff there who would be planning their training and to whom they were expected to turn if in difficulty. It was ironic that the very features which had been considered so important when planning the Winfrith scheme had been overlooked to such an extent that it now seemed impossible that the Students would develop any loyalty or sense of belonging to Harwell unless some rapid changes were made. The immediate first aid treatment was to bring this group back to Harwell for a month or so before they went to college and put them through an intensive induction course which would help them to find their way about Harwell and get to know the training staff.

John Wallace had visited Winfrith regularly, especially to see the Students, but this produced a different relationship, and it was gradually becoming clearer that the First Year Instructor was a most important cog in the wheels, and frequently the first sign of a problem was when a boy sought out his original Instructor and had a word with him. For all apprentices going through the Winfrith Apprentice School this avenue was almost closed to them when they returned to their parent establishment, but at least the Craft Apprentices could establish a somewhat similar relationship with their Advanced Training Instructor at Harwell, but for the Students going off to college there was no such alternative.

By 1961 it was finally decided that the sensible decision would be to return first year student training to Harwell, so preparations began to establish a first year training workshop for some eighteen apprentices and eventually two instructors were recruited to bring the new workshop into operation for the intake of Student Apprentices in September 1962. One of the new instructors, Bob Foyle, was mechanical and had been doing similar work at Capenhurst, the other Gordon Wall was electro-mechanical and had been employed in the Special Plant Section in Building 7 at Harwell. Some modifications in the first year programme were made for the students, all of them doing a common basic programme for six months then doing a further six months on electrical or mechanical work, depending on their discipline. The two new instructors worked closely with the two existing Advanced Training Instructors and did some joint projects with them and they covered each other for leave or sickness. Although the intention was to recruit eighteen students each year, there was nearly always a short fall in this number due to some applicants changing their mind or failing to obtain the requisite 'A' levels; when this happened the numbers were made up by retaining some Craft Apprentices at Harwell who would otherwise have gone to Winfrith.

Just when the first doubts about Student training at Winfrith were being expressed the scheme had to face up to yet more changes in personnel. After a whirlwind period of just over two years at Harwell, John Dolphin left for a post in private industry but kept in touch with the scheme and attended a number of reunions during the rest of his life. At almost the same time John Wilcox-Baker took up an appointment at the still rapidly expanding Reactor Group at Risley and during the following few years was involved in setting up the Apprenticeship Scheme there. It was not long before their first year apprentices were also being trained at Winfrith so the ripples in the pond first created by Harwell were spreading wider and wider.

The loss of two such personalities meant, of course, that two new characters would be introduced and although both were vastly different from their predecessors, they proved to be staunch friends of the scheme and each left it richer through his efforts. Mr R F Jackson took over from John Dolphin as Head of Engineering at Harwell, and of course could pick up the threads immediately and as he had a special interest in higher technical education and was a member of the Southern Region Advisory Council, was in a position to be of tremendous help during a period when rapid and drastic changes were occurring in this field. The new Group Labour Manager, George Malyon, who replaced John Wilcox-Baker came from a similar post at the ROF Establishment at Radway Green and as a complete newcomer to Harwell he must have found the atmosphere of a research establishment quite different from the more formal structure of the ROF's. In particular, to take over as Secretary of an Apprenticeship Board whose members had a particularly close camaraderie through most of them having been at Harwell since its inception, could not have been easy, but in a very short time he too was making his own special contribution to the development of the Harwell scheme.

CHAPTER 9

THE TRAINING BOARDS AND OTHER DEVELOPMENTS

By the early nineteen sixties apprentices were being trained by the Research Group for Harwell, Culham, RCC Amersham, the engineering unit at Bracknell, NIRNS (now the Rutherford Appleton Laboratory) at Chilton, and, of course, AEE Winfrith. Most apprentices attended the Technical College most readily accessible from their homes and with the large catchment area this meant that at one period Research Group apprentices could be found on day-release courses at some twelve or thirteen colleges in the south of England including Bournemouth, Poole and Weymouth on the south coast and almost every college between Swindon and Slough and Aylesbury and Newbury. Inevitably the number of students at most colleges was quite small and with only the odd student in a class, Harwell could do little to influence the content or structure of the course.

This problem became very obvious after the move of first year training to Winfrith where all apprentices living in the hostel attended Weymouth Technical College during their year away from home, but most of the Winfrith based apprentices were recruited from the larger centres of population in Poole and Bournemouth and of course attended colleges in those areas. At Harwell, prior to the move it had proved possible to run a combined course at some of our local colleges, which enabled an apprentice to be entered for both a City and Guilds Intermediate examination and a second year National Certificate course examination after two years of study. His results in those examinations determined his future course of study and in the event of him proving unsuitable for a National Certificate course, he could continue with the C&G course without loss of time and could still obtain an excellent qualification within his apprenticeship. When Weymouth Technical College was invited to run such a course for Harwell apprentices they quite understandably declined, pointing out that they had no requests for such a course locally; it would have no continuity as Harwell apprentices left after one year, and they would not even receive any credit for any examination successes resulting from it.

This proved to be quite a blow, because the Harwell scheme was particularly anxious to prove that a well co-ordinated course of study would result in a much improved examination success rate, in the same way as it had already proved that a well-planned course of practical training enabled apprentices to attain a totally unexpected degree of skill after only two or three years. This was at a period when radical changes in Industrial Training and Technical Education were foreshadowed and it was recognised that with the emphasis which the UKAEA placed on both adult and juvenile training and technical education, they should be in a position to influence those changes and certainly with something like eight hundred apprentices under training should be able to demonstrate the success of the programme which had been developed throughout the various establishments. Of all the colleges being used at this time Newbury was one which was rapidly expanding on the engineering side and because of its location also had the highest number of Authority apprentices on courses, because there was a big overlap here in the Harwell and Aldermaston catchment areas.

As the needs of both establishments were similar it was proving possible for a number of classes to be run almost entirely for their apprentices, so it was natural to seek advice from this college on how best to resolve the problems which had arisen at Weymouth, particularly as many of the apprentices affected would become Newbury students on their return to Harwell. It became apparent that the

only way to reach the desired academic standard by the end of the second year would be by increasing college time during that year by an unacceptable amount. It was finally decided to bring the apprentices back to Newbury college for a series of short blocks during the first year thus giving them a continuous course of study. The concept of block-release was relatively new for Harwell apprentices so it was decided to run it on a trial basis for one year, and initially only for electrical apprentices. It was not realised then that this decision was in fact the birth of a scheme of integrated training and education which would place Harwell and Newbury College at the very forefront of developments in that field.

The Student Apprentice Scheme continued to be the subject of change during this period also, when the decision was made that they should become non-industrial grades. The career outlets for them, following their training were all in the staff field and it certainly seemed logical that appropriate Appointments Board which would be responsible for placing them should also have a hand in their initial selection. It was anticipated that the change to staff pay and conditions would make the scheme more attractive to 'A' level candidates and subsequently the additional entry date of January, as well as September, was introduced to make possible the selection of candidates who had remained at school until then to compete for Oxford or Cambridge scholarships. The concept was sound and indeed many of the successful applicants were of a very high standard, but a combination of factors brought about its downfall.

The very attractiveness of the conditions meant that it came to be looked on as one of the most desirable grants for anyone seeking an engineering degree at University, rather than the first step to a highly rewarding career in Atomic Energy. When the first of this new breed were graduating from University it coincided with a freeze on recruitment to the professional grades, with the result that most vacancies were for highly specialised senior grades, few arising in the basic grades and a first or upper second honours was certainly essential to compete successfully for any of those latter posts. The last straw came when from an intake of twenty-three Students only two got posts at Harwell. A few had failed examinations at various stages and were therefore dropped from the scheme, others with very good degrees applied for and were awarded Post Graduate Scholarships, while the remainder with varying levels of qualification were caught in the annual trawl of universities by industry at that time and accepted posts which were more lucrative than Harwell could have offered and in a number of cases achieved this before even completing their full period of training at Harwell.

It is not surprising that when analysing those results it was decided that this was an excessively expensive way of training young professional engineers for Harwell and recruitment to the grade was suspended in September 1966. A few more were recruited in 1967 and for a few further years before being discontinued by Harwell, then only the Rutherford Laboratory continued to recruit two or three each year with a fair degree of success and so kept the grade alive within the Research Group Scheme, but it was to be some years before a much modified and highly selective alternative scheme was re-introduced for Harwell itself.

Nationally also, sweeping changes were taking place in both training and technical education. The White Paper on Industrial Training of 1962 had been followed by the Industrial Training Act of 1964 which set up more than twenty Industrial Training Boards having the power to impose levies on all firms within their scope and award grants which varied according to the amount and cost of any approved training which the firms carried out. This 'stick and carrot' approach gave all forms of training a tremendous impetus and vast armies of training officers at all levels were

being recruited by firms anxious to cut their levy to a minimum and raise their grant to the maximum.

Although the training of Authority apprentices had been of a very high standard, a number of changes were brought about because of the standards imposed by the Training Board to which Harwell was answerable. The main problems were in administration and organisation rather than the development of new techniques, because the Board had identified a number of modules of skill for each craft and those had to be taught, tested and certified for each apprentice so that on completion of his apprenticeship he would have a nationally accepted certificate designating the skills at which he was deemed to be proficient. At Harwell there was no difficulty in reaching the standards, the main problem was that of identifying and recording each completed phase of training, and this was where the Advanced Training Workshops began to pay dividends as the nature and sequence of work could be varied to suit the apprentice and the module he was working on, with the result that most apprentices had completed the bulk of their syllabus before being attached to a major workshop on site.

The changes were not confined to practical training however, because new diagnostic courses had already been introduced to help determine the most appropriate course for each apprentice to follow and already plans were envisaged to alter the whole structure of National Certificate courses and revise the examination system and ultimately replace it by some system of frequent tests and continuous assessment. The more immediate problem however was the decision to reduce the length of apprenticeship from five years to four for those starting in September 1966. This meant that two groups of apprentices would finish concurrently in 1970 and would need to be placed and thereafter if the numbers recruited remained the same, the total complement of apprentices would be reduced by a fifth. Strangely enough it was during this period that a peculiar anomaly became apparent in the field of Technical Education which gave rise to considerable heartsearching. Apprentices cannot always be persuaded to recognise the value of qualifications and it is often years later when they are married with responsibilities that they appreciate how their promotion prospects could be improved by additional certificates.

This situation is certainly not new but for many years it could easily be remedied provided the individual had the will to take a course of evening classes and just keep at it. The position now is vastly different, however, because there are few colleges outside major cities where technical courses are available in the evening, so unless the young craftsman works for an enlightened employer who is prepared to grant him day-release, the qualifications gained by the end of his apprenticeship will remain his qualifications for life. The reduction in the length of apprenticeship further worsened this situation because in many cases it meant an additional year being knocked off the apprentices technical studies.

On reviewing this situation a paper was submitted in July 1966 to R F Jackson and other members of Management with "Proposals for Integrated Practical Training and Technical Education of Apprentices". The aim was to attain the best qualification possible after four years and the only way to achieve this was to make better use of the time, by avoiding duplication of practical work or laboratory work at college and in the training school, and by ensuring that such work done in the training school would be written up to the standard required by the course syllabus, and time spent on such work would count as college time. In collaboration with Mr Pocock of Newbury College such a course was prepared for Electrical and Mechanical apprentices based on a block release course with one week in three spent at college with intermediate visits to the training school by

college lecturers. The only way to ensure that all apprentices could benefit equally was to transport them all from Harwell to the college in the morning and return them to Harwell in time for the departing coaches in the evening. To make sure that sufficient students would be available to make the course viable, Aldermaston were invited to participate and because of their location this presented no difficulties. After being granted conditional approval by Harwell Management, the scheme was subsequently accepted by the City and Guilds of London Institute and finally by the Southern Regional Council for Further Education. This last was the most difficult hurdle because many local colleges were reluctant to lose students from their area, while others were quite emphatic that they could run the same course for Harwell equally well, and while this was almost certainly the case, no other college was in the same geographic location to Aldermaston and Harwell, and any sub-division of the course would have destroyed its viability.

Most apprentices taking part finished with the qualifications in four years which had taken their predecessors five years and no college could have worked harder for the success of the course than Mr Pocock and his staff, with the late Mr Fred Veness deserving a very special mention. The experiment probably deserved more publicity than it was given at the time but the major revision of technical courses overtook events and brought about many changes which altered a number of features of the course. Nevertheless, many of the outstanding advantages are incorporated in the courses which have now replaced it so that even today apprentices are continuing to reap the benefits of this unique experiment in collaboration between work and college.

CHAPTER 10

THE WHEEL TURNS FULL CIRCLE

About the time when first year Student Training was returned to Harwell further changes were taking place in the Authority as a whole, and one of the results was the transfer of AEE Winfrith from the Research Group to the Reactor Group with headquarters at Risley. This had been preceded by the replacement of the Joint Apprenticeship Board by two separate boards, but with each establishment being represented on the other, so the immediate results of the change were quite limited although Harwell was in the position of a customer using the Apprentice School at Winfrith which was now controlled and managed by Reactor Group. The most immediate result was a steady increase in the numbers of Risley apprentices attached to the school for first year training under similar conditions to the Harwell Craft Apprentices, but variations in conditions and the application of travelling concessions etc produced some friction between the groups and added to the probability of first year training ultimately being returned to Harwell.

When the Apprentice School was opened at Winfrith it was considered that this year away from home could replace some of the best features of National Service, which of course ended in 1960, but experience showed that where parents would readily accept the gradual change from schoolboy to adult while he was living at home during his first year in employment, they often expressed criticism of the hostel and training school supervision when they saw those self-same changes at infrequent intervals of a month or so during that year. It was felt by many that this period away from home was coming at the wrong end of the apprenticeship so it became one more factor influencing the decision to return first year training to Harwell. Yet another factor to minimise the beneficial effects of the year away from home was the growing emphasis being placed on the formal teaching of liberal studies and character development by the Training Boards and Technical colleges. Harwell responded to this by developing a number of short and long courses in collaboration with the Department of Extra Mural Studies at Oxford University and the Youth in Industry branch of the YMCA. Senior Apprentices went on tours of Industry organised for Harwell by the Industrial Society and they also attended annual conferences run by them for Young People in Industry. Most of those activities were organised jointly by the Industrial Relations Department and the Apprentice School.

When George Malyon had taken over from John Wilcox-Baker he had continued work in this field and as the emphasis on it grew, the Labour Managers of his staff who were successively attached to Apprentice Training became increasingly involved in this work. Elliott Cave was a major influence in this field and was followed by first Ken Lovatt then Joan Hubbard, then for a lengthy period Peter Grimes who gave it a lot of effort until he left for private industry and was succeeded by Albert Lombard who eventually took over from George Malyon on his retirement. From the Apprentice Training staff, Harry Wells was the one most concerned with the organisation of the courses, conferences and tours which formed part of the establishments involvement in liberal studies and character development. He was totally dedicated to training and the activities of the Apprentice Association and guided it through some of its more difficult phases. Almost always found alongside Harry Wells on those occasions was Fred Veness of Newbury College who, with less obligation but similar generosity, gave tremendous support to the Harwell boys' activities.

This emphasis on the development of the personal qualities of the apprentice had been a feature of the Harwell scheme since its inception and undoubtedly had a bearing on the high quality of the apprentices completing their training. In the Autumn of 1966 when the Workshop Manager, Mr S Price, one of the founder members of the Apprenticeship Board retired, the scheme lost one of the strongest supporters of this feature of training. Some years earlier he had instituted an award to the most deserving third year apprentice for "Application, Good Timekeeping and Personal Tidiness" and it is good to see that the tradition of this prize has been continued ever since. At the end of that year Bob Jackson left Harwell to take up a senior appointment at Risley and though this brought about some reorganisation of the Engineering Division, Jim Southern remained as Chairman of the Board, so continuity of planning was maintained during this period when the impact of the Training Boards was really starting to be felt.

Over the next three years the experiments with block release and the integrated course in collaboration with Newbury College were all beginning to bear fruit and lending weight to the arguments in favour of returning first year training to Harwell, so that the practical work of that year could be better planned as part of the composite course and so help to offset the disadvantages of the shorter apprenticeship which was now in being. The growth of the new Development Workshop in Building 501 made some space available in Building 9 and this together with the reduction in Student Apprentice training made it possible to establish First Year Advanced Electrical and Mechanical Workshops there. So in September 1970 the wheel had turned full circle and all Harwell Apprentices and Training staff were once again all housed together under one roof at Harwell, but as in the past it was not to retain that form for long.

For some time the Education and Training Branch at Harwell had been growing in stature and reputation since the early days of an Isotope School and Reactor School and now with the growing emphasis on training, it was responsible for the short and long term training of most staff at Harwell in addition to running courses for external students. The Apprentice School had been making use of some of the short courses provided by Education and Training Branch and in return had been able to assist that department in the running of some short specialist courses for other employees. This then was the position when a decision was made to introduce incentive bonus schemes to workshops in the UKAEA and so at Harwell a new Management Services Division was set up under Mr Southern with that as one of their main tasks. Engineering work at Harwell was by then under three main headings; Engineering Services, Reactor Engineering and Special Plant Maintenance, so with the departure of Mr Southern to MSD, Apprentice Training was transferred initially to that division also but it was apparent in due course that this was not really the most logical choice. The Training Board required annual returns on all training being carried out at Harwell so it made sense that Apprentice Training should become a section of Education and Training Branch thus grouping all the major training sections together with a central records and office organisation.

This move was looked on with some doubts by a number of the engineering staff who felt that some of the traditional links between apprentices and engineers were being eroded but Jimmy Hill, who was then Manager of Education and Training Branch, did much to allay their fears and over the next few years carried out a programme of modernization which brought the equipment of the lecture rooms and workshops of the Training School up to the highest possible standard. Additionally, Jim Southern retained Chairmanship of the Board on which all the 'customers' of the scheme were well represented, so reasonable continuity was maintained but there was always enough new blood to ensure that there would be no stagnation either.

With the return of first year training from Winfrith, the full value of the integrated courses at Newbury College was becoming more apparent and progressively as the new Technician Education Council (TEC) courses were introduced, it was found that the system was ideal for them also. The TEC courses were designed to replace the C&G Technician Courses and the long-established ONC and HNC courses and comprised a fairly wide group of subjects or topics from which various combinations could be selected, ideally suited to the requirements of a particular firm or branch of the industry. The system of terminal examinations was largely replaced by a programme of continuous assessment and phase testing. The increased emphasis on practical work or laboratory work brought the links between college and training school even more closely together and the prior existence of the integrated course made it relatively simple for Newbury College to introduce a course with the ideal combination of units to meet the requirements of Harwell and Aldermaston apprentices.

This period too saw further changes in the training staff because the rapid growth of training in industry created promotion outlets for some of the well-qualified Harwell Instructors, and of course the return of first year training created vacancies for additional first year instructors. This increase in both staff and apprentices at Harwell more than offset any reduction in work brought about by the closure of the Bracknell unit and the severing of the links with Winfrith and the merger with Education and Training Branch brought additional experience in running some short courses for some supervisors and other employees.

The next changes to occur were major ones in the Apprentice Board, first the retirement of George Malyon, Group Labour Manager followed in 1973 by the retirement of Jim Southern. As Secretary and Chairman respectively they had steered the scheme through a most eventful decade and left it in a very healthy condition. Jim Southern was succeeded as Chairman by Bill Wood, Division Head of Research Reactors Division and as an ex-Dockyard Apprentice himself, most anxious to maintain the highest standard of training possible. One of the main objectives at this time was to find a building for the Apprentice School where they could be self-contained without sharing facilities with other employees and where, in consequence, rules and conditions could be established in the best interest of their training. A number of buildings at Harwell were becoming vacant as a result of some earlier projects being transferred elsewhere or discontinued. A considerable floor area was required for the number of apprentices in training, particularly with the growing emphasis on Advanced Training and the desire to include such amenities as a lecture room, tea room etc. The sub-committee which was set up to perform this miracle looked at various buildings and drew up a number of abortive plans until it proved possible to take over the development workshop in Building 501 which was being dispersed for various reasons. There were some drawbacks to this building, particularly the shortage of rooms suitable for lecture rooms and the unique feature of it having three back doors and no attractive front door for visitors, but it was a vast improvement on any accommodation the school had previously occupied at Harwell so the modifications were carried out and the school finally transferred there in September 1975. John Wallace had been housed in the Education and Training Centre for some time now and when 501 was opened Harry Wells moved to an office there with responsibility for the new workshops and staff.

Just over a year later in December 1976 having seen the new school set up and running smoothly, Bill Wood retired and was replaced as Chairman of the Board by Ken Henry who had succeeded him as Division Head of RRD.

Those early years in 501 were a period of intense activity in the development of new first year and second year programmes of practical training for both mechanical and electrical apprentices. It proved possible to introduce new large scale and long term projects which had been impossible before and much of the practical work had been developed in collaboration with Newbury College staff to supplement the work on the new courses which were by now settling down to their final form.

As the thirtieth year of the Scheme's history was nearing completion in June 1978 John Wallace retired, and this meant the departure of the last founder member still serving on the Apprenticeship Board so one of the last links with 1948 was severed. As will be seen from this brief history of those thirty years it was now vastly different from the scheme in 1948 but most important of all it had given birth to a tradition which made all ex-apprentices proud to have belonged to it and a look at the achievements of those eight hundred young men must certainly make all who had some part in it, proud to have trained them.

CHAPTER 11

THE APPRENTICE ASSOCIATION

From the earliest days of the scheme, the need to establish a tradition was recognised by all concerned with the scheme and as the total number of apprentices grew year by year every encouragement was given to them to participate in various activities as a group, representing the Harwell Apprentices. This was never easy however because only the students and a few craft apprentices lived on the site, more than half the total number were scattered over the countryside between Harwell and Swindon, Oxford or Reading. With transport almost non-existent outside of working hours, opportunities to get together were strictly limited but the group of boys in the hostel provided a nucleus round which something could be developed and although this group included a number of AEOs and SAs, it was really here that the Apprentice Association was born.

As the first group approached the end of their apprenticeship and also became more mature they also became increasingly determined to celebrate the end of those five years of toil in the most auspicious way they could. The result was that in September 1953 they organised one of the most imposing (and expensive) dinners seen at Harwell up to that time which ended with a group of determined if somewhat nervous young men proposing or replying to a series of toasts in the presence of the Chief Engineer and most members of the Apprenticeship Board. From this grew the custom of each apprentice having a tankard at the end of his time inscribed with his name, the title "Harwell Apprentice" and the dates of him starting and finishing.

Within the next two years the Association had really got off the ground, had organised subscriptions and done a bit of fund raising. With a lot of help and encouragement from Bob Wakeley who had by then joined John Wallace as an Instructor, the scheme made a historic decision which was really the foundation stone of all the traditions related to the Apprentice Association at Harwell. They used most of their limited funds to have a specially designed book made for them in Oxford. It was leather bound in the blue, silver and black colours of their Association and the frontispiece was the final verse of Rudyard Kipling's "If" while the foreword on the next page was as follows:-

FOREWORD

> The Apprentice scheme at AERE Harwell is now firmly established, and already apprentices trained here are applying their skill at home and abroad. A high standard has been set and attained, therefore the Apprentice association is confident that not only will apprentices always remain proud to be known as Harwell trained but also, the establishment will take pride in having trained them.
>
> So that a permanent record may be kept of those who successfully complete their apprenticeship at Harwell, the Association has provided this book.
>
> It is, of course realised that the success of Apprentice Training at Harwell will always be founded on the interest, enthusiasm, and above all, the example of certain persons who will from time to time guide and influence the development of the scheme. It is felt that a record of appreciation should be maintained, and for this reason pages have been set aside so that their names may be entered, on the recommendation of the committee then in office. The names of distinguished guests and speakers attending any apprentice function will also be recorded in this book.

It is hoped that all future apprentices will be given the opportunity of examining this book regularly, that from its pages they will draw incentive to continue the tradition of achievement which has been fostered, and that when their names are entered, they too can be described as **Harwell trained Craftsmen of Character**.

AERE Apprentice Association

July 1955.

The presentation of the book into the safe keeping of the Establishment was made at the End of Time Dinner in 1955 and it was accepted by Mr Percy Bowles who was then Acting Chief Engineer.

The presentation was made on behalf of the Association by Dr Robert Cope who had been one of the first intake of apprentices at Harwell in 1948 and who, now in 1955, had become the first Atomic Energy apprentice to be awarded a PhD. The boys had carefully staged the event to ensure it made a profound impression on all present but particularly on their guest speaker John Dolphin, Chief Engineer at Aldermaston with whose apprentices they had considerable rivalry. Impressed he certainly was, and little did they know how this incident would enhance the support they would receive from him a few years later when he joined Harwell. He was an enthusiastic supporter of his own apprentices but he was the first to recognise that the Harwell scheme displayed a cameraderie and spirit which he envied, but which must come from the apprentices themselves and could not be imposed from outside. Thereafter, the Association went from strength to strength and as long as there was a strong contingent of active apprentices in the hostel who could form the core of an imaginative committee this state of affairs continued.

By September 1956 with a lot of help from 'Toby' Dawson of Industrial Relations the Association produced the first Apprentice Newsletter and since then issues of widely varying quality have continued to appear at erratic intervals. One excellent series included reports by apprentices on interviews they had carried out with a number of senior engineers at Harwell while in another series they endeavoured to find out and report on the fate of all past apprentices. This literary talent was further developed in the mid 1960s when the Association published a magazine for a series of Rag Weeks which they held in Abingdon.

On returning from an outing somewhere in the Midlands the apprentices brought back a stuffed Polar Bear which they purchased to become their mascot. Christened 'Murk' this bear has had an even more distinguished career than many of the apprentices themselves. He has been kidnapped and ransomed and was for long much sought after by apprentices from Malvern, Farnborough and Aldermaston. He is undoubtedly the only bear to have been taught to jump by parachute by the "Paras" at RAF Abingdon; a feat for which he was awarded his wings, which were unfortunately lost or stolen from his furry chest in one of his later escapades. On yet another occasion when a group of Russian visitors were on their way to the restaurant at Harwell they were more than a little surprised when a motor cycle drove slowly past them with a polar bear on the pillion eyeing them suspiciously. 'Murk' also gave his name to the Rag magazine mentioned earlier and of course took part in some of the activities and major events run by the Association including the Twenty-first Birthday of the Scheme, held in the Randolph Hotel in Oxford. Although he disappeared for a time after that event he was ultimately returned to the safety of his cage in the apprentice store and although pronounced fit at his last medical he was beginning to show both his age and the scars of his exploits. (Alas 'Murk' is no more - his stuffing fell out and he expired. He was dispatched for cremation circa 1981).

The Rag Weeks already mentioned were quite an event in Abingdon for a few years in the mid-sixties with all the essential ingredients, Beauty Queens, Pram Races, Piano Smashing, Tug-of-War over the river and culminating of course in a Carnival Parade and Rag Ball. Most events ran quite smoothly and successfully, but as more apprentices and students from local firms and colleges began to participate and endeavoured to outdo one another, a few stunts did backfire and as Harwell were the organisers Mr Le Cren had the job of pouring oil on troubled waters. In spite of this however some thousands of pounds were raised over those years and handed to Mayors of Abingdon for local charities.

The end of this intensely active period can probably be attributed to two main factors, the growing number of students on full-time courses and eventually the reduction in the student apprentice recruitment. Both of those factors drastically reduced the number of hostel residents of the type most likely to organise such events, and again, the boys living at home were too widely dispersed to be able to come together outside of working hours to provide the co-ordinated organisation which was needed.

Nevertheless, the Assocation remained active in other directions. They ran a number of reunions and functions similar to the Twenty-first Birthday at the Randolph which has already been mentioned and from 1966 became increasingly involved in the design, building and racing of pedal cars, particularly in the twenty-four hour race at Bristol which is looked on as the Grand Prix of pedal car racing as it attracts entrants from some of the most famous Apprentice Schools in the country. They were never disgraced and in a number of years they put up highly creditable performances but unfortunately it was not until just after the period covered by this thirty year history that they attained the crowning glory of a first place.

A very select group of senior staff have had the unique honour of being invited to become President of the Association and another choice band have been awarded the distinction of Honorary Membership, but an even more highly honoured group have had the distinction of having their names entered in the Apprentices 'Blue Book' by the apprentices themselves in recognition of the work they have done for the scheme at Harwell.

As time passes, more and more ex-apprentices are to be found among the training staff at Harwell and as long as this situation continues the best traditions of the Apprentice Association will be fostered and perpetuated, and Harwell and industry will recognise how well time and money was spent in producing those hundreds of "Harwell trained Craftsmen of Character".

Acknowledgements

Thanks are due to the many colleagues and staff at Harwell for the considerable help in writing this History. Especial thanks should be acknowledged to John Wallace and Harry Wells to whom the major burden fell in searching the files and memories of staff involved.

CHAIRMEN OF THE HARWELL APPRENTICESHIP BOARD

1947 - 1978

Jack Diamond C.B.E.	1947 - 1948
Maurice J Marchbanks	1948 - 1957
John R V Dolphin C.B.E.	1957 - 1959
James Southern	1959 - 1973
William F Wood O.B.E., J.P.	1973 - 1976
Kenneth J Henry O.B.E.	1976 - 1985

HARWELL APPRENTICESHIP BOARD SECRETARIES

Dennis Mettrick	1947 - 1953
John R Wilcox-Baker	1953 - 1959
George Malyon	1959 - 1972
Albert Lombard	1972 - to present

THE HARWELL (RESEARCH GROUP) APPRENTICE TRAINING STAFF 1948 - 1978

John Wallace M.B.E.	Chief Instructor	1948 - 1955
	Apprentice Supervisor	1955 - 1958
	Apprentice Training Manager	1958 - 1978
Kenneth R Wakeley	Apprentice Instructor (Mechanical)	1949 - 1956
Wilfred G Caesar	Apprentice Instructor (Mechanical)	1951 - 1954
	Apprentice Instructor (Mechanical)	1958 - 1970
*George S Wood	Apprentice Instructor (Mechanical)	1954 - 1958
	Apprentice Supervisor (Winfrith)	1958 - 1961
Harry E Wells	Apprentice Instructor (Mechanical)	1956 - 1964
	Apprentice Supervisor	1964 - 1978
	Apprentice Training Manager	1978 - to present
*Norman Harding	Apprentice Instructor (Mechanical)	1958 - 1961
*Albert A Jennings	Apprentice Instructor (Mechanical)	1959 - 1961
*Arthur P Lynch	Apprentice Instructor (Mechanical)	1958 - 1961
*Victor McCarthy	Apprentice Instructor (Mechanical)	1958 - 1961
*Richard Scorey	Apprentice Instructor (Mechanical)	1958 - 1961
*G Frederick J Seddon	Apprentice Instructor (Mechanical)	1958 - 1961
*Clifford J Summers	Apprentice Instructor (Electrical)	1959 - 1961
Ronald Turner	Apprentice Instructor (Electrical)	1960 - 1966
Gordon F K Wall	Apprentice Instructor (Electrical)	1962 - 1969
Robert Foyle	Apprentice Instructor (Mechanical)	1962 - 1975
Frederick F Stroud	Apprentice Instructor (Mechanical)	1965 - 1978
John M Hughes	Apprentice Instructor (Electronics)	1966 - 1975
Trevor Meadley	Apprentice Instructor (Electronics)	1968 - to present
Malcolm E McIntyre	Apprentice Instructor (Instruments)	1970 - 1973

* Staff employed at AEE Winfrith transferred to Reactor Group 1961.

Derek Southern	Apprentice Instructor (Electronics)	1970 - 1978
Stephen P Murphy	Apprentice Instructor (Mechanical) Apprentice Supervisor	1970 - 1978 1978 - 1983
Michael Burnham	Apprentice Instructor (Mechanical)	1970 - 1975
Raymond L Elks	Apprentice Instructor (Mechanical)	1975 - to present
Frank T Wren	Apprentice Instructor (Electrical)	1975 - to present
Roland S Wise	Apprentice Instructor (Mechanical)	1975 - to present
Rodney R Rose	Apprentice Instructor (Mechanical)	1975 - 1981
Anthony R Dyer	Apprentice Instructor (Mechnical)	1978 - to present

Appendix III

Important Events

1947 - 1978

April 1947	A group of Harwell staff gathered to consider the feasibility of establishing an Apprenticeship Scheme. This meeting was the formation of the Apprenticeship Board.
September 1948	First Intake of 13 Harwell apprentices.
September 1951	Intake increased to 21. Second Training Workshop opened in Hangar 9.
1952	The first Harwell apprentice (M.J. Newland) to win the M.O.S. Tom Nevard Memorial Cup.
1952	The formation of the Harwell Apprentice Association.
1955	Apprentice Association Book to the establishment for safekeeping.
1957	Visit by Her Majesty the Queen and His Royal Highness Prince Phillip.
1957	The first Harwell apprentice (J.E. Jessup) to win the Harold Tongue Cup.
1958	First year training moved to A.E.E. Winfrith.
1958	Advanced mechanical training workshop opened in Hangar 9.
1960	Deferment and National Service ends.
1960	Advanced electrical training workshop opened in Hangar 9.
1961	AEE Winfrith transferred from Research Group to Reactor Group
1962	First Rutherford Appleton Laboratory (N.I.R.N.S.) apprentices recruited.
1962	First year Student Apprentice training returned to Harwell (Hangar 9) from A.E.E. Winfrith.
1962/1963	Apprentice Rag week in Abingdon in aid of local charities.
1966	The apprenticeship reduced to four years.
1966	One week in three block release courses commenced at South Berkshire College of Further Education for all Craft apprentices at Harwell.
1969	The last Harwell Student Apprentice recruited (C.I. Walker)

/1969

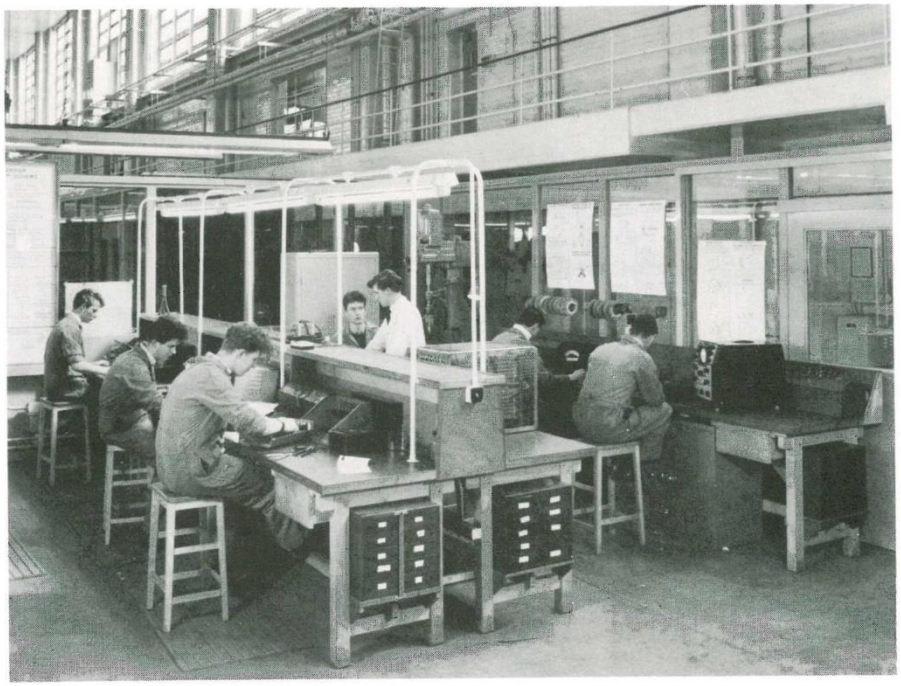
1969	21st Anniversary - Ex-apprentice reunion at Randolph Hotel, Oxford.
1970	All first year training returned to Harwell (Hangar 9) from A.E.E. Winfrith.
1975	Apprentice Training transferred from Hangar 9 to Building 501.
1978	John Wallace retired, Harry Wells became the Apprentice Training Manager.

The first intake September 1948

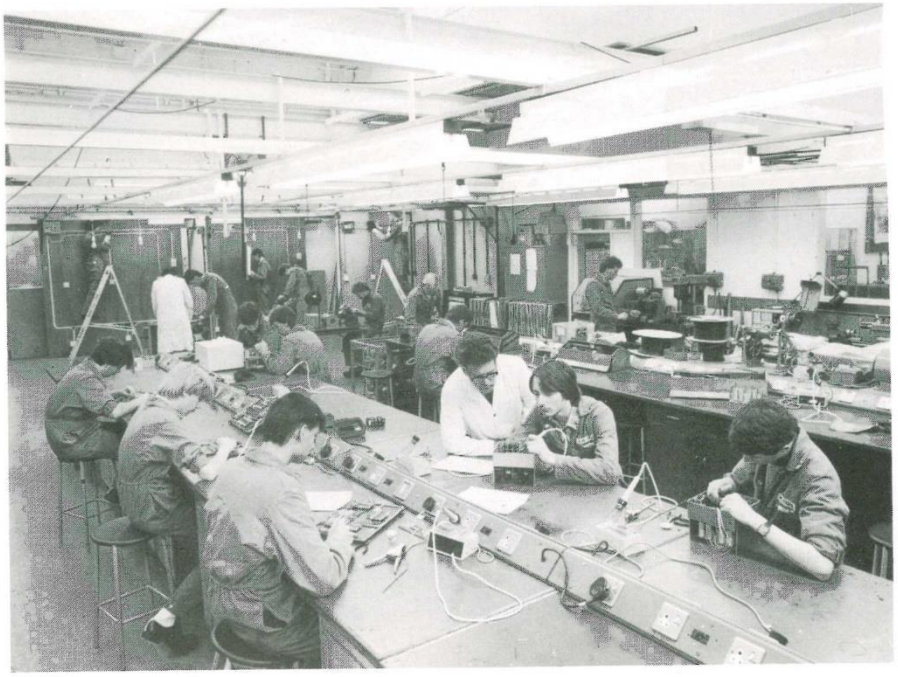
30 years on, End of Time 1978

The first year training shop in Hangar 9 1948

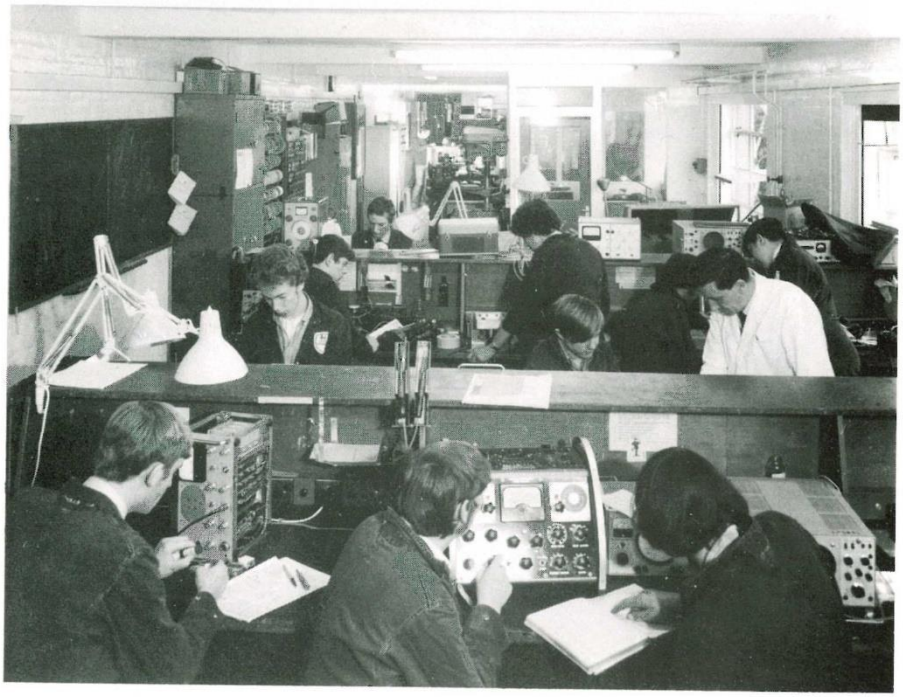
Mechanical Training Workshops.
Building 501 1978



The first Electrical training workshop.
Hangar 9 1960



Electrical Training Workshop.
Building 501 1978



The first Electronic training workshop.
Hangar 9 1969

Electronic Training Workshop.
Building 501 1978

Sir John Cockcroft
presenting a certificate of apprenticeship
to Sydney Burnett at the 1955 end of time dinner.

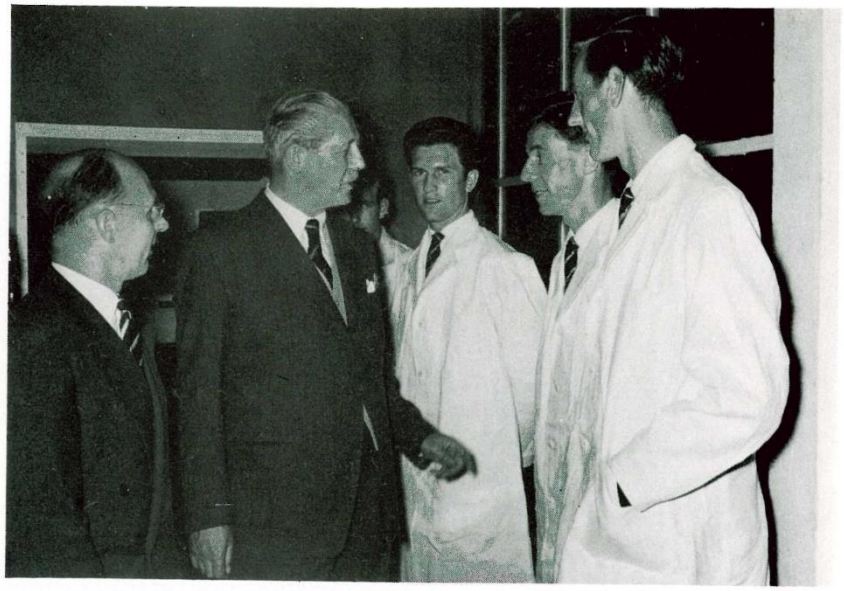
The Chief Engineer Harold Tongue
presenting the Harold Tongue Cup
to James Jessup at the 1957 Prize Giving ceremony.

Royal visit March 1957

Dr.J.V.Dunworth, H.M. the QUEEN, K.J.Henry, J.R.V.Moore, H.R..H.Prince Philip, Sir John Cockcroft, R.F.Jackson.

Royal visit March 1957

H.M.the Queen standing with Mr.P.Bowles, talks to John Woodgate (2nd. year apprentice)



August 1957
Right Honourable Harold Macmillan, Prime Minister
visits the Apprenticeship Scheme.
Left to Right. G.S.Wood, Prime Minister, J.R.Rackstraw, B.F.Spindler,
R.O.Pelham, B.G.Dean.

April 1958
Field Marshall Montgomery of Alamein
signs the Apprentice Association book in the presence of
Roger Pelham, James Southern and John Wallace.