ERRATUM:

For NORTH IRELAND read
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THESIS

INTRODUCTION

A. General historical background
B. Physical Education in Northern Ireland

(1) History
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PHYSICAL EDUCATION TEACHERS' TRAINING CENTRE FOR GIRLS

JORDANSTOWN

NORTHERN IRELAND
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INTRODUCTION

The contemporary approach to Physical Education must, of necessity, influence the conception of the Architectural forms involved in a Physical Education Training Centre. Although it is not intended to commence with a detailed history of the development of Physical Education it is felt nevertheless that an outline of that development will assist in the appreciation of the more recent trends in this field of Education.

The basis of the present day thought on the subject may be said to go back to the 19th century in this country. During that time two distinct traditions of Physical Education emerged. Although each had originated before 1800, neither had reached a developed stage by that time. One approach to Physical Education had its beginning in the Public Schools of England. In these institutions games appeared early in the century mainly as a result
of the spontaneous activities of the boys. These at first met with the disapproval of those in authority, but as the century wore on organised games became recognised by the authorities. The 'organised game' became a feature of all Public Schools and was regarded as a potential force in the education of the sons of the middle and upper classes.

Outside the sphere of the Public Schools a different type of Physical Education developed. It had as its foundations military drill, callisthenics and gymnastics. At the end of the century these had produced a system of Physical Training which was being adopted in almost all Public Elementary Schools.

In Public Schools the games which came to form the major part of Physical Education were the team games of football, cricket and rowing, all of which were extremely indigenous sports. On the other hand, gymnastics were mainly of foreign origin, although they were not unknown in this country in earlier centuries. The systems of gymnastics which found root here in the 19th century were derived for the most part from Germany and Sweden. Those systems which were based on the German approach to gymnastics made use of ropes, poles and horizontal and
parallel bars. Other systems were influenced by the work of P.H. Ling in Sweden which tended to emphasise free standing exercises without the use of apparatus. It was the latter, so called Swedish system which found most favour at the end of the 19th century, and which formed the basis of the system later to be adopted and sponsored by the medical department of the Board of Education.

There were, therefore, two types of Physical Education at the beginning of the present century, that in use in the Public Schools which concentrated mainly on character training and the system used in the elementary schools which concerned itself particularly with discipline and the physiological effects of systematised exercises. Since each had evolved as the result of social as well as physical needs it would have been extremely difficult for any exchange of ideas on Physical Education to have taken place. Furthermore, the two types of schools provided for the needs of children of entirely different age groups. The games played by the boys in the Public Schools were entirely suited to their adult physique. Considerable modification would have had to be made before they would have been
suitable for the children in the elementary schools. In addition the elementary schools suffered from crowding and lack of space, a feature virtually unknown in the Public Schools.

Perhaps the most serious obstacle was however the distinction which developed between so called 'training' and 'recreation'. It was first made by the Board of Education in 1910, and persisted until 1937 as the 'Physical Training and Recreation Act' of that year testifies. At that time, Physical Training was held to have a peculiar educational significance and moral value which its supporters denied to games. Games were considered to be recreative, pleasurable and of less educational value. It was also mistakenly assumed that physical training could be made enjoyable only by the most competent and enthusiastic instructors. This distinction between 'training' and 'recreation' was very pronounced at the beginning of the century, but fortunately it has tended to dissolve with the years almost in parallel with the social distinctions in Education.

Perhaps the most significant contribution to the blending of the two traditions has been made by secondary grammar schools, and to an almost equal extent by Girls'
High Schools and Public Schools. The Balfour Act of 1902 heralded the incorporation of grammar schools in a comprehensive system of secondary education. The Secondary Grammar Schools derived their Physical Education from both Public Schools and Elementary Schools, and at long last common ground was provided on which the two traditions could merge. The Girls' High Schools, many of which were founded in the late 19th century included Physical Education in their curricula at an early stage in their career. Their approach was partly inspired by the current practices in boys' Public Schools, but their concern for social accomplishment and health led to the introduction of dancing, callisthenics and, later, Swedish drill into their classes.

During the 19th and 20th centuries various institutions and organisations outside the school system also exerted their influence upon the development of Physical Education. Such organisations as the Gymnastic Association and the Boy Scout movement have contributed towards the development, and have certainly affected both theory and practice in Physical Education.
Undoubtedly, the most significant period in the advance of Physical Education has been the war years and the post war period. The last war, like the Boer War and the Great War, was accompanied by fresh educational legislation. In Section 53 of the Education Act of August, 1944, a specific duty was placed on all Local Education Authorities to provide adequate facilities for recreation and physical training. The Act also transferred to the newly formed Ministry of Education the function of the National Fitness Council and Grants Committee, which had been set up under the Physical Training and Recreation Act, 1937, to deal with Physical Education. In addition to the new legislation, there was some rethinking of fundamental principles. Experiments were carried out with new activities and new apparatus. Secondary Schools, being considered too far advanced for
experiment with techniques, were not used, but Primary Schools in different parts of the country tried out new forms of apparatus. In Essex, the traditional Swedish apparatus was modified and adapted for children of junior school age, but in Bristol the new apparatus was more revolutionary. Scrambling nets, poles, ropes and other apparatus which had been originally devised for military purposes were set up in school playgrounds. These seemed, at last, to satisfy children's natural desire to climb and hang as well as to jump and play on the ground. By 1947, some eight Local Education Authorities had devised special forms of apparatus to satisfy the same basic need for free and individual practice of the climbing, heaving and balancing skills.

Formal Gymnastics were themselves re-examined. Tables of exercises were compiled with the emphasis not merely on the basis of exercising each and every part of the body, but upon the effect that the exercises would have upon those parts. The new tables were divided basically into a mobilising section, a strengthening section and a skill learning section. The latter section included not only the normal vaulting and agility skills but many more drawn from games and sports.
The trend outside the schools for older girls and women to take up modern dancing generally led to the replacement of free standing exercises by 'Movement Training' in many schools. Formal instruction and rigid formations were abandoned to allow for more freedom, self-discovery and self-expression in movement. Open air activities, such as walking, cycling, camping and also activities like rock climbing, sailing and skiing, which had previously been exclusive to the middle and upper classes, were more and more indulged in by boys and girls. In the schools, after the war, games and sports began steadily to displace gymnastics from its prominent position in Physical Education, with the result that there has been an ever increasing demand for instructors and coaches.

The approach to the training of specialist teachers was also reconsidered during the war years. The Physical Training and Recreation Act of 1937 had suggested the establishment of a National College of Physical Training. The Mac Nair Committee on the Training of Teachers and Youth Leaders, in its report published in 1944, however, recommended that colleges for the training of Physical Education Specialists should be set up in each training
area, and should be associated with other institutions. This resulted in many cases after the war of a clear association of the women's specialist colleges with the new University institutions of education. Many Universities, themselves, became concerned with the training of teachers of Physical Education. Several offered courses in the teaching of one or more Physical Activities, and these were taken as optional parts of courses for post-graduate diplomas or certificates of education. In 1946, Birmingham University included Physical Education among subjects which might be offered for the degree of B.A. At last Physical Education had won recognition as a subject which was not only appropriate for study within a university, but was also capable of sustaining a course leading to the award of a degree.
PHYSICAL EDUCATION IN NORTH IRELAND

Although specialist Physical Education Training Colleges had been established in England and Scotland as early as 1900, no facilities existed in North Ireland until as recently as 1953. Teachers qualifying in Physical Education or specialising in the subject had either to receive their training in centres outside North Ireland, or be content with the limited facilities provided at either of the two teachers' training colleges in Belfast. The latter only provided qualifications which would now be acceptable in primary school education.

These arrangements barely satisfied the educational demand in North Ireland prior to 1947, but the expansion of the educational programme initiated by the Education Act (N.I.) in that year gravely altered the position.
The Act reorganised the statutory system of Public Education into the three progressive stages of primary, secondary and further education. Secondary education was further divided into three forms; students would thus attend either a Secondary Intermediate School, a Technical Intermediate School or a Grammar School.

Perhaps the most significant feature of the Act was the provision of compulsory secondary education for all children up to the statutory school leaving age of 15 years. However, the lack of sufficient accommodation and teachers resulted in leaving age being temporarily reduced by Regulation to 14 years. The Ministry, nevertheless, hope to introduce the statutory leaving age during 1957, although they realise it will lead to temporary hardship and difficulties.

Hand in hand with the new school programme, the Ministry of Education turned its attention to the problem of teacher training. The Stranmillis Teachers' Training College, Belfast, which was directly under its control was enlarged. The demand for specialist Physical Education teachers under the new education programme was realised and steps taken to provide facilities. The size of North Ireland, with a population of about 1½ million,
did not merit the planning of Training Colleges in each Local Authority's area, and it was decided to provide one central college for the whole of North Ireland. The difficulties involved in planning a joint college for men and women were realised, the approach to the training of each sex having little in common, and so it was decided to go ahead with the establishment of a college for women only.

In the early post-war years the Ministry of Education acquired property on the outskirts of Belfast, and it was decided to make use of the land acquired, some 35 acres, and the old house for the provision of the college. The house itself was duly renovated and converted to form the main part of the college and an extension wing added to provide a gymnasium and classrooms etc. The initial idea of providing a residential college was later abandoned, as the result of the objections of various religious leaders, a stumbling block too often encountered in North Ireland. A great deal of the purpose in providing the college was lost as a result of this change of plans; what was hoped to be a central college for North Ireland has turned out to be little more than a small scale day college. The Ulster College of Physical Education, the
name adopted for the college, was completed in 1953, with facilities designed to cater for a three year course with approximately 20 pupils in each year. Recently a fourth year course was added to the curriculum to train qualified teachers in Physical Education, and considerable difficulties have arisen due to the very limited facilities.

A comparison of the Gymnastic facilities provided at the general teachers' Training Colleges in Belfast with those at the Physical Education College seem to indicate many deficiencies, both in quality and quantity, in the specialist college.
It is intended to suggest a more satisfactory architectural solution to the problem of providing a girls' Physical Education Training College in North Ireland. The site for the project would include those grounds at present occupied by the existing college.

The present college buildings were planned for some 60 pupils but now cater for approximately 80 students. Since the number of candidates selected for admission is determined not only by the number of places available, but also by the need for teachers of Physical Education in the schools, particularly secondary schools, it is quite feasible to assume that an ultimate demand for student places in the college will be in the region of 120 three year course students plus 20 one year students.
The centre would also have to provide for members of the teaching staff in addition to administrative and domestic staff.

The function of the college, which would be operated and financed by the Ministry of Education, would be to ensure a supply of fully qualified women teachers of Physical Education for service in recognised schools in North Ireland. In addition to the basic function of the college, the facilities would be used for further education, classes in Gymnastics and games as well as for college clubs. During vacations, particularly the long summer vacation revision classes would take place at the college. The intention is that the Centre would cover as wide a range of activities in Physical Education as possible, without interfering in the prime function of teacher training, and so put to full use the facilities provided.
SITE

The site proposed for the centre is located on the northern shores of Belfast Lough, and is in the Townland of Jordanstown.

Lying to the north of the main Belfast to Carrickfergus trunk road which runs along the shores of Belfast Lough, it is some two miles from the Belfast City boundary. The site includes the grounds of some 35 acres belonging to Dalnada House. The South Western boundary is formed by a pre-war private housing development, which lines both sides of the third class road connecting the main trunk road with the old village of Jordanstown to the North West of the site. The North Eastern extremity of the site is defined by hedged fencing which separates it from pasture land, while to the North West pasture land and hedging divide it from
the Belfast-Larne railway tracks.

Apart from the number of private houses lining the South East and South West of the site, the bulk of the surrounding community is found in the neighbouring town of Whiteabbey, a small industrial centre which is \( \frac{1}{2} \) mile to the South West of the site on the main trunk road. The small town of Greenisland is \( \frac{1}{4} \) mile along the main road to the North East. The old village of Jordanstown forms the apex of the triangle of surrounding communities, and is a little over a \( \frac{3}{4} \) mile to the West of the site.

The district has a moderate bus and train service with approximately hourly frequency connecting it with Belfast, Carrickfergus and Larne.

The good general aspect and prospect of the site, the reasonable nature of the land and the fact that gradients on the site are not extreme make it a very suitable setting for a Physical Education Centre. It has the advantage of being in close proximity to the city of Belfast, which is the main academic centre in North Ireland, and harbours the principal University in the Province, without having many of the disadvantages normally associated with an industrial centre of Belfast's size.
RESEARCH

The background to this study has been based on information obtained from various educational centres and authorities, each of which was approached from a particular aspect of the problem.

The number of new colleges of Physical Education completed within recent years is relatively small. Perhaps one of the most important contributions to the number is the Royal Central Gymnastic Institute in Stockholm, which was constructed during 1944/45 and was designed by the Swedish Architects Wejke and Ödeen. Considering the important part Swedish Gymnastic theory has played in influencing the approach to physical education in this country, the visit to the Institute
promised to be full of interest and was perhaps accompanied with the hope that the architectural contribution would be equally as interesting as Swedish theory.

The Institute, itself, which is, I believe, the only centre in Sweden for the instruction of Physical Education Instructors is sited next to the Stockholm Olympic Stadium of 1912. The buildings of the Institute have their main entrance from Lidingö Vägen but remain almost hidden behind the Olympic Stadium. Perhaps this together with the period during which the building was constructed can account for the drab and uninteresting nature of the Institute, as it is seen from the main drive. The disappointing first impression of the buildings themselves, and, in particular, the entrance porch are, however, forgotten on entering the building; undoubtedly the architecture is in the interior. Obvious financial and material restrictions have produced a most interesting use of soft wood and treated brickwork as interior finishes.

The facilities provided in the Institute are separated into three principal sections. The core of
the Institute, which is in essence an enclosed court plan, is some three stories high and provides the entrance hall and museum area on the ground floor. All administrative quarters are planned on two sides of the museum, the student common room and music room opening off the third side. A basement floor partly provides additional display space for athletic museum pieces, and the student dining hall. The first floor which is approached by the decorative stairway in the centre of the court has provision for the smaller academic facilities including the library, the anatomy laboratory and three class rooms.

The main entrance to the second unit, which contains the four gymnasium and ancillary accommodation is by way of a first floor link corridor. The corridor extends along the full length of the four gymnasium, which are planned end to end with stores between, and serves the dual function of providing a spectators gallery through the glazed partitions into the gymnasium and of providing the spine from which there is downward access to changing rooms and the gymnasium floor.

The third unit, which lies to the east of the central block, is reserved wholly for the experimental
Physiology Department, and is used not only by the College, but by various sections of the community, including the Airforce for research into particular conditions of physical fitness.

The overall layout of the Institute is straightforward and is not without interest. The whole of the Institute has not to date been completed and the Swimming Bath unit will shortly come under construction to form a wing of the gymnasium block.

To place the merits of the planning of the Institute in their proper perspective, it is important to mention briefly the requirements which the buildings have to cater for. The Institute holds two courses for students, the principal course being for teachers in Physical Education and extends for two years; the second course is for trained Physiotherapists who also spend two years at the Institute. Each course has separate classes for men and women in gymnastics and other classes held in the gymnasia. In the teachers' course, classes vary from 30 up to 35 students in each group, at each stage, while classes for physiotherapists are slightly smaller. In the Prospectus for the Institute, two courses are offered for men and women in each year according to their
age group. In all some 200 pupils attend the Institute each year.

In general, the courses at the Institute are similar to those provided in this country, although the actual methods taught to students are dissimilar. Students at the college, however, have one advantage over their fellows in this country, and this is mainly with respect to their outdoor activities, since they are able to differentiate between winter sports and general sports. Groups spend two weeks each year in skiing and skating, and during their second year student teams travel abroad for ten days to play competitive games with other Colleges.

The Institute is controlled by a Board of Governors, and all tuition is taken by students free of charge. The attitude of the staff members at the Institute towards a residential college is perhaps worth recording. The general feeling was that the Institute should not be residential, since it was felt that both students and instructors preferred to go their own ways after college hours.

The Dunfermline College of Physical Education, Aberdeen, provides tuition for 200 students approximately
the same number of students as the Royal Central Gymnastic Institute, Stockholm, and it can be taken as being fairly representative of the colleges in this country. The college is one of the oldest in the country, having been founded in 1905 by the Carnegie Dunfermline Trust, as a Training College for Women. During the last war, the college moved from Dunfermline to Aberdeen, and in 1948 the National Committee for the training of Teachers decided to move the college permanently to the University city, where the students could benefit from the wider student life and closer co-operation with the University and Training College. The direction of the college is now in the hands of the Committee of Management which consists of representatives of the Aberdeen Provinical Committee and the University as well as members of the Central Executive Committee of the National Committee for the Training of Teachers.

The present buildings, which are only the temporary home of the college, consist of a college building and three residences. The makeshift arrangement of the college has resulted in many restrictions and the accommodations is far from ideal. At present, the main collegiate accommodation consists of a large assembly
hall, two gymnasia, remedial room and several lecture rooms, in addition to common rooms, library and a dining hall. It is perhaps worth noting that in the new college buildings, which are at present under consideration, they have requested facilities for a large assembly hall, a separate games hall, a dance hall, three large gymnasia, a swimming hall and a remedial clinic, which they feel are necessary for the satisfactory tuition of their 200 students.

The attitude of the college towards the Residence is that it should preferably be in one building, but designed to contain blocks of 70-80 students. The Residence is envisaged as being part of the group of college buildings but separated from the teaching blocks. The authorities made several other preferences for the planning of the residence, one being the use of a central dining room for the college, and the other, with regard to the bedrooms, in which preference was shown for single study bedrooms for students kept clear of the ground floor. General staff accommodation is contemplated in the form of bed study rooms with flatlets for the senior staff members. Little preference was given for a complete separation of staff quarters from
student quarters, since a certain degree of control by residential staff members over students was felt desirable.

A few general facts have already been mentioned about the Ulster College of Physical Education. It is nevertheless interesting to note the scale of accommodation provided for the present student capacity of 80 students. The college was financed by the Ministry of Education, and this seems to account for the provision of only the minimum facilities.

The teaching units which have been provided includes one small gymnasium, an anatomy laboratory, two class rooms and the normal ancillary accommodation. The converted Dalriada House provides accommodation for the student dining hall and kitchens, the student common room and living accommodation for four residential staff members. Staff accommodation is in the nature of bed sitting rooms, with a bedroom and sitting room for the Principal and Vice-Principal. The staff common room/dining room, kitchen and bathrooms are communal. Provision was also made for a student sick-room in the staff section of the house.
The extension of the student capacity from 60 to the 80 who now attend the college has already presented difficulties and it is felt that one gymnasium is not adequate. It was of interest to discover that no provision was made in the original planning to extend the college at a later date. Opinion at the college still regrets the fact that the college is not residential, since the present arrangement does not give the staff wide enough scope to assist and guide the students in general physical fitness and health.

The visit to the Stranmillis Teachers' Training College in Belfast, which is residential, was made with the intention of discovering what residential accommodation was provided for students, in addition to obtaining an indication of the sizes of classrooms etc. normally provided in Teachers' Training Colleges.

Although the College is attended by both men and women, living-in facilities are provided only for women. The residential quarters are in two units. Stranmillis House, itself, once a boarding school, is now used to provide mainly double bedrooms for first year students. It was felt that the provision of double bedrooms for
students in the first year would help to break down the feeling of institutional isolation often felt by students in their early months away from home.

In all the unit is self contained with its own kitchen, dining room, common room, study and games room. Four staff members have quarters with the students. The student capacity of the unit is approximately 60 and this number has proved to be rather large and uncontrollable. As a result rather severe rules and restrictions have had to be imposed on students to safe-guard against pilfering.

The other residential unit at the college is a single storey cottage hostel which was constructed some thirty years ago. This hostel accommodates some 100 students in addition to which there is accommodation for two hostel matrons. The hostel is of H form in plan, student bedrooms being situated on the two main arms with communal facilities forming the link. The accommodation is virtually separated into two sections with approximately 50 students and a matron in each section. Student accommodation which consists of single bedrooms approximately 9' x 9' in floor area, is planned on both sides of a main corridor with
bathroom and pantry facilities disposed along the corridor. The use of the long corridor system has resulted in a dismal institutional atmosphere in the hostel.

Several visits to both the Physiotherapy Clinic of the Royal Infirmary, Edinburgh, and the Princess Margaret Rose Hospital for Sick Children, Edinburgh have provided a general working knowledge of the Remedial clinic which in this country is becoming an essential part of a College of Physical Education. The college facilities are expected to provide not only the opportunity of training students in both the diagnosis and treatment of special physical conditions but also to form an after-treatment clinic for children who have been discharged from hospital. The opinion was expressed in both hospitals that the inclusion of a Remedial Pond in a Physical Education College would be advantageous, but this seems only feasible in the larger colleges.

A great deal of assistance was obtained from the Ministry of Education and the Ministry of Finance of Her Majesty's Government in Northern Ireland, who
would in fact represent the clients of the proposed scheme. It was discovered that since a college of Physical Education was highly specialised both Ministries would not impose rigid restrictions as to cost or extent of the project as long as they were satisfied as to the justification of expenditure. Neither would attempt to relate the project in any way to their school regulations although the underlying policy of economy would persist. It was discovered that although no standard existed for areas etc. of units in planning the present college of Physical Education in Northern Ireland the class rooms and laboratory were, however, planned on the Ministry of Education standards. Data relevant to the Ulster College of Physical Education on the point of cost was obtained from the Ministry of Finance, and the approximate figures given were 80/- per square foot, and £1,700 per student place for both conversion and the extension. The above figures represent the only cost indication available for Physical Education buildings in Northern Ireland, and possibly in Great Britain, and are now some five years out of date. It was suggested by both
Ministries that cost of all educational buildings in general should be kept down to as near 70/- per square foot as possible, since in Northern Ireland this represented the most economic figure for the province.

The Ministry of Education provide for all expenses incurred in both the upkeep and maintenance of the existing college grounds. They employ a groundsman and arrange for full supervision of all planting of shrubs and trees on the site.
RESEARCH: THE COURSE

In Physical Education Colleges in Great Britain there are generally two courses of instruction offered. The main course in Physical Education is the three year course, and is primarily intended for girls of 18-19 years coming directly from senior school with a set level of achievement in their school leaving certificate. The course offers qualifications as Physical Education Instructors which enable candidates to take up posts in all Secondary Schools. An alternative one year course is also available. It is normally offered to women who are already qualified teachers and is designed to equip women, trained primarily as school teachers, to take part in the work of Physical Education. Normally the course is open to teachers in service and to women students who
have just completed their training. The course does cover the same ground as the three year course although no attempt, normally, is made to reach a similarly high standard.

Up until a few years ago, the policy in Physical Education establishments was to train teachers as specialised Physical Education Instructors only. It is now realised that this is not in itself a sufficient training, and most colleges are now introducing instruction in other subjects to provide a background training in more general subjects. It has often been the case in recent years for the practising instructors to find that once they were beyond the age of about 35, they could no longer cope with the strenuous activities demanded by their position. In such cases, they had to retire or be faced with the alternative of returning to a teachers' college to qualify as teachers in other subjects.

The step to supplement the Physical Education Instructors' qualifications has also taken place in another direction, that is, in the field of Physiotherapy. It has now become fairly general for Physical Education students to receive about 8 terms training and practice
in Remedial Exercises together with one month's experience in the Physiotherapy Department of a hospital. The latter being normally taken in the second year of the course. Students obtaining their diplomas in Physical Education can then qualify as Chartered Physiotherapists by carrying out an additional 12 or 18 month's training in a Physiotherapy Department, instead of taking the normal three year course.

This broadening of the curricula in Physical Education Colleges has no doubt encouraged more people to take up the career of Physical Education Instructors, and at the same time provided a course of instruction which will produce a more capable type of specialist teacher.

Course Analysis

It will be appreciated from the above outline of the courses of instruction generally given in Physical Education that there are, in fact, three main elements which must be considered in planning a Physical Teachers' Training Centre.
1. The centre must primarily be able to provide the student with adequate training in the various activities which form the backbone of Physical Education, and at the same time train the students as potential Instructors. This involves not only the incorporation of Gymnasia, Playing Fields etc., but in addition, facilities for teaching practice, lectures etc. must be provided.

2. In addition to those provided for the prime function of the Centre, facilities must be available for instruction in background subjects including English, General Knowledge etc. This indicates that the incorporation of lecture halls is essential.

3. The third function which must be considered is that of the remedial side of the course. This is primarily intended to go hand in hand with the training in Physiotherapy which students receive. The general tendency, today, partly due to the shortage of fully trained Physiotherapists is to provide a Remedial Department in Physical Education Colleges where 'after treatment' classes are held for school children. Apart from the obvious advantage this has of removing the necessity of Hospitals requiring children's gymnasium etc. for such treatment, it provides the opportunity for students to
train under qualified staff to carry out the more specialised forms of Physical instruction necessary. Such training has the twofold advantage of not only providing teaching experience, but also furthering the students' abilities to diagnose physical ailments in young children. It is considered part of the qualified instructors responsibility to be able to detect physical ailments in school classes and to be either able to provide suitable exercises or else advise on more specialised treatments.

The most significant point about the Remedial side of the course is that the facilities provided have a direct connection with the general public. Normally, classes are held several times per week, when parents bring along their children for Physical treatment. This suggests a separate department in the centre, or at least a separate entrance to this section of the centre's facilities for the general public.
TIME TABLE SURVEY

A brief survey was made of the time tables currently in use in two girls' colleges of Physical Education in an attempt to discover the actual amount of use the various facilities receive as a percentage of the hours available per college week. Unfortunately both colleges investigated suffer from shortage of accommodation, and the following results will therefore only be of relative value.

<table>
<thead>
<tr>
<th>SURVEY</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Gymnastic facilities</td>
<td>95%</td>
<td>96%</td>
</tr>
<tr>
<td>(2) Swimming facilities</td>
<td>21%</td>
<td>12%</td>
</tr>
<tr>
<td>(3) Lecture rooms</td>
<td>89%</td>
<td>84%</td>
</tr>
<tr>
<td>(4) Laboratories</td>
<td>-</td>
<td>33%</td>
</tr>
<tr>
<td>(5) Assembly Hall</td>
<td>10%</td>
<td>-</td>
</tr>
<tr>
<td>(6) Games facilities</td>
<td>25%</td>
<td>36%</td>
</tr>
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</table>
GENERAL DESIGN CONSIDERATIONS

In the design of facilities for a Physical Education College, the architect has to be aware of the very close link between field sports and activities carried out in the gymnasium. It is not alone sufficient to place the college units close by the playing fields, but a concept of unity of purpose must be obtained between the two units; this can only be achieved by sympathetic architectural creation and sympathetic landscape design. The strong link between normal outdoor and indoor activities implied in the approach to Physical Education today should be apparent in the architectural design, and the essential architectural unity of building and site established.

We cannot be content, as so many in the past have
been, to design the gymnasium and do little more than plot the positions of sports' pitches on the site plan. The effort applied to make the gymnasium not only functionally successful but aesthetically acceptable must also be applied to the rest of the overall whole, the sports fields. The neglect of landscaping, particularly in connection with educational building since the war, is only too apparent. The economic restrictions cannot fully be blamed for the situation, since there are too many examples where existing attractive natural features instead of being retained have been cleared aside by the bulldozer.

It is perhaps difficult to understand the general lack of appreciation of the natural features of the landscape in this country. There is no lack of natural character in our countryside and there is no lack of tradition in landscape design. It might be hoped that we have realised our recent shortcomings, and that both architect and Public Authority will now strive to ensure that we do not repeat the folly of recent years.

In this country, where housing schemes have tended to devastate our countryside, it is up to the present and future generations to see that Architecture and
nature can exist side by side. There does not seem to be a more appropriate place to begin to show a sympathetic appreciation of nature and natural forms than in our educational establishments.
THE PROBLEM

The problem involved in the design of the Physical Education Centre may be said to fall into two general divisions: the strictly planning problem of providing the necessary facilities in a good workable relationship to each other and the more architectural problem of integrating the building forms and the site into a unified whole.

The latter aspect of the problem depends largely on the overall spacial relationships of the units involved, from the smallest living unit to the space enclosing the playing field areas. The greater space of the site itself must be landscaped to subdivide it into more intimate spacial units, and those units must
relate to the building forms, and the overall building forms to the small living units. In this way the human body will find the intimacy of each space it uses, the larger spaces for running and jumping, the smaller spaces for sitting and sleeping. Each space should be related to the human activity for which it is intended.

The design of the college must also relate to the client not only in the strict observance of requirements but also to his purse. The strictest economy in capital cost, running cost and maintenance is urged by the Ministry of Education in all educational projects. In the scheme under consideration site work will form an unusually high proportion of the total work involved, but a great deal of saving can be achieved by making the fullest possible use of the facilities and services already available on the site. The retention of as many of the existing trees and other natural features as possible is particularly desirable on this site where trees, particularly, help to produce a very positive character.
THE ANALYSIS OF ACCOMMODATION

The Physical Education Centre can be broken down into the following units:

1. The outdoor facilities
2. The indoor facilities

The indoor facilities comprise the two principal units:

A. The Collegiate unit
B. The Residential unit

A. The first section of the study, i.e. the provision of the collegiate facilities can be divided into the following headings, each classified according to functional requirements:

(1) Administrative
(2) Communal
(3) Teaching
(4) Circulation and other ancillary accommodation

(1) The Administrative section of the college will comprise:

(a) Principal's Room
(b) Deputy Principal's Room
(c) Head Lecturers' Rooms
(d) Staff Rooms
(e) Main Office, ancillary office accommodation and storage
(f) Medical Room
(g) Visitors' Room
(2) Communal facilities include:

(a) Assembly Hall with Stage  
(b) Dining Hall with kitchens etc.  
(c) Common Rooms  
(d) Library  
(e) Lecture Theatre

Items (b) and (c) may, in fact, be so planned to serve both the Collegiate Building and the Residential Buildings.

(3) Teaching facilities required in the college will include:

(a) Laboratories  
(b) Classrooms, lecture rooms, study rooms  
(c) Gymnasia  
(d) Dance room  
(e) Games Hall  
(f) Swimming Pool

(4) Circulation and ancillary accommodation:

(a) Entrance Hall  
(b) General Circulation  
(c) Lavatories and showers  
(d) Cloakrooms and changing rooms  
(e) Drying rooms  
(f) Stores  
(g) Cleaner's Stores  
(h) Heating Chamber

B. Residential Units.

It is the opinion of various authoritative bodies in this country that residential quarters are necessary
to ensure the fullest possible benefit to students from their courses of instruction. The reasons behind the recommendation are:

(i) The provision of student living quarters close to the College
(ii) Proper supervision of the student diet
(iii) The proper guidance in everyday hygiene and general living habits of the students by the instructors.

This necessitates the provision in the Residential Units of quarters and residential facilities for

i. A certain number of the Collegiate Staff
   ii. A qualified dietician
   iii. Medical personnel

in conjunction with those provided for the students themselves.

Function once more forms the basis of the analysis of the Units into:

(1) Residential Accommodation
(2) Administrative
(3) Communal
(4) Circulation and Ancillary
These main units can be further divided:

(1) Residential Units
   (a) Student bed-study rooms
   (b) Staff bed-sitting rooms, flatlets and kitchenettes
   (c) Visiting lecturer's room
   (d) Living accommodation for the warden
   (e) Living accommodation for nurse
   (f) Sick Bay accommodation
   (g) Caretaker's living accommodation

(2) Administrative units will mainly comprise
   (a) Warden's office and accounts room

(3) Communal accommodation will include:
   (a) The Staff common room and kitchenette
   (b) Staff main dining quarters
   (c) Student Common Rooms and Reading Rooms
   (d) Student Dining Hall
   (e) Games and T.V. Room
   (f) Student Kitchen/Pantries
   (g) Domestic Staff dining room/rest room
   (h) Main Kitchen

(4) Circulation and Ancillary accommodation including:
   (a) Entrance Hall and general circulation areas
   (b) Staff and student bathrooms
   (c) Linen cupboards and store
   (d) Kitchen storage rooms
   (e) Cleaners' stores
   (f) Luggage stores
   (g) Heating Chamber
   (h) General storage accommodation.
PLANNING ANALYSIS
GENERAL DESIGN INFORMATION

PART I COLLEGIATE UNITS
GYMNASIA

The units have to provide for the general requirements of tuition and practice of gymnastics, and in addition would be used for classes in Dance, Movement Training, Demonstration and in certain instances for School Remedial Exercise classes. The gymnasium form one of the most important centres of the collegiate unit, and students spend the major part of their training time there.

It is essential that each gymnasium be planned so that the full floor area could be used when necessary. The bulk of the apparatus required in the gymnasium will be used for pure gymnastics. For a class of 20 students it is estimated that the following equipment will be required:
32 Wall bars
4 Single Span double beams
2 Vertical Window ladders
20 Climbing ropes
8 Beam saddles
10 Balancing benches
2 Jumping Stands
1 Horse
1 Vaulting buck
4 Mats
1 Agility mattress
1 Spring board

Both basic movement classes and dance classes will require little or no apparatus at all. It is, therefore, essential that adequate and easily accessible storage space be provided for in the planning layout. Such apparatus, as wall bars, parallel bars, ropes etc. are normally designed in such a way as to provide free space when not in use.

Changing and dressing accommodation, showers and toilet facilities are, of course, necessary but certain general aspects of their design are worth noting. Perhaps the most important is the fact that since special floor finishes are normally used in gymnasia, it is essential that the use of ordinary footwear, carrying in grit and dirt from outdoors is made impossible. The most
satisfactory method of avoiding this is in making
the only access to the gym-floor through the changing
rooms. An alternative emergency exit is required, but
this normally follows the pattern of being fitted with
panic bolt gear allowing exit but not necessarily
entrance to the gymnasium.

Since demonstration is an integral part of the
instruction, it is generally necessary to make adequate
provision for spectators. As suggested earlier,
spectators would not be tolerated on the gym-floor
unless they wore special footwear. The most satisfactory
answer is to provide a gallery capable of seating a
student class of about 20-30 persons. The gallery floor
should be raked to give each person as full a view of the
floor as possible. Access to the gallery should allow
for the easy circulation of spectators without the latter
being a source of annoyance to those using the gymnasium.
It is quite often possible to plan the gallery over
either the gym store or part of the changing accommodation.

More general planning considerations concerning the
gymnasium are those in connection with the collegiate
unit as a whole. Gymnastics and other activities are
normally a source of noise and it is, therefore,
advantageous if the units are planned as a detached block or are so planned that an effective sound lock is provided between it and the rest of the building. At the same time, with consideration to its functional importance, it is necessary that the units be fairly centrally placed so they may be easily accessible from all sections of the collegiate buildings.

Together with several other units in the section due consideration has to be paid to the methods of heating and ventilation. There can be little doubt of the advantages of air conditioning in gymnasia, particularly over systems of recessed wall radiators and natural ventilation which tend to reduce the effective usable wall areas. Cost factors often, however, dictate the practicability of air-conditioning, but where these facilities are also required in other sections, it should be worthy of consideration.

Lighting is particularly worthy of considerable attention in Gymnasia, since natural lighting arrangements largely dictate the areas of wall space available for fixtures such as wall bars, rope apparatus and parallel bars. The maximum possible wall space is normally required, and to facilitate for this many authorities
recommend that windows should be high level, extending from ceiling level to a minimum of 7'6" above floor level, and be placed on both sides of gymnasium. An alternate suggestion is that one long wall be glazed for a greater part of the length, preferably facing southwards, and have French window arrangements which might open to an open air gymnastic area. This might be more advantageous than the requirements for wall space, although provision could be made for wall bars to be fixed to the glazed wall, and these could be detachable for window cleaning. In general, glazing should be protected by wire mesh or alternatively some form of reinforced glass should be used to eliminate the danger of breakage. A rather important feature of the wall bars, whether fixed to a glazed or solid wall is that they are set sufficiently off the floor to allow for cleaning.

Artificial lighting, normally required for evening use, is best arranged as recessed or semi-recessed fittings having the maximum height above floor level to allow an even distribution of light. Guard grills are essential fittings to provide protection against damage from balls etc. It is universally agreed that no form of pendant fittings be used since the risk of damage is
fairly great.

The ceiling, in general, should be designed with a flat soffit, since most manufacturers of gym apparatus require a flat surface for fixing their gear. Ceiling constructional details have to allow for the fixing of apparatus, particularly when a framed construction is used.

The gymnasia floors are perhaps the most important feature to be considered. The floor should be resilient but not sprung as a dance floor. In general all forms of block flooring are unsuitable partly due to the danger of splinters. Strip flooring is generally regarded as the most suitable, with boarding running across the gymnasium. Manufacturers generally recommend that where gym shoes are always worn flooring should be rift-sawn British Columbian Pine, Maple is unsuitable, but in all cases oak provides the best flooring material. Floors are normally treated with a non-slip floor oil which seals up the pores in the timber and renders it immune from washing.

Colour in the Gymnasium must be considered in light of the need for keen vision. Strong accents of bright colour on walls together with reflective wood
finishes are often distracting. Emphasis must be on the apparatus and not the background. Colours which reflect light to a large extent, particularly white are not suitable except for ceilings where they will not appear so strong since the ceiling will only receive reflected light. In general, plain walls should be treated with colours of a medium reflection factor to avoid silhouetting.

The actual area of gymnasium floor required depends of course on the classes to be accommodated. The following sizes have been used in gymnasias.

(1) 65' x 35' x 16' Carnegie Physical Training College, Leeds
(2) 75' x 45' x 18' Chelsea College of Physical Education, Eastbourne
(3) 80' x 40' x 20' Scottish School of Physical Education, Jordanshill, Glasgow
(4) 70' x 40' x 18' Ulster College of Physical Education and Ministry of Education School

It is generally held that minimum dimensions of 70' x 35' are necessary for the most advantageous arrangements of beam apparatus. Classes in the college will be approximately of 20 students so that dimensions
of the area of 70' x 40' x 18' should be sufficient even for dance and movement classes, which require more space than normal gymnastics. Grid and exact dimensions of structural elements should be designed with certain features in mind, particularly the distances required between rope and bar apparatus, as well as the basic size of wall bar units which are normally designed on a 2'9" module. With reference to structure it is important to note that fixing of wall bars etc. to the inner 4\(\frac{1}{2}\)" leaf of cavity walls is not practicable, the walls are not sufficiently strong, and fixing tends to dislodge parts of brickwork in the wall. Manufacturers request either alternate fixing methods or else more substantial walling.

ANCILLARY ACCOMMODATION

Basically one set of changing accommodation with showers, toilet and drying space is required for each gymnasium, since each gym unit will be used simultaneously with the others. Dual use of the
arrangements are possible where they might be used in addition for changing in connection with playing field activities. As suggested earlier (gymnasium considerations) the unit should form a block between the normal internal access to the gymnasium. In the case of an outside gymnastic area being provided, or in the case of the accommodation being used for sports fields, it becomes essential that direct external access be provided in addition to internal. Although in a residential college elaborate general cloakroom accommodation for outdoor wear is not essential, facilities for hanging and drying of raincoats will be required in certain circumstances, particularly if the Residences are some distance away from the collegiate buildings. Close consideration of the grouping of such accommodation with changing rooms is necessary to eliminate unnecessary duplication.

Ventilation in changing rooms, showers and toilets is important, it should be very good although full consideration must be given to the elimination of draughts. Cross ventilation is undoubtedly the most satisfactory, when ample consideration is given to
draught prevention. It may be possible to couple ventilation and heating by using air conditioning, particularly where it is in use in the gymnasium. Otherwise adequate safeguards will be needed to prevent danger from exposed heating pipes or radiator units.

Natural lighting can either be obtained by the use of high level windows or roof lights. High level windows should have a minimum height of 4'6" and preferably extend to ceiling height particularly where natural ventilation is used. The windows should be glazed with obscure glass particularly in shower compartments. Artificial lighting must be considered with the continual damp and often wet atmosphere and full precautions taken to protect exposed live points from tampering.

The total area of the accommodation should be based on space of approximately 16' per pupil, the figure currently in use in Ministry of Education (Northern Ireland) Secondary Schools, and incidentally higher than that in use elsewhere. Ceiling height of 8' is normally sufficient.
The Changing Room Proper should have provision for small kit and clothes storage, the wire cage type being perhaps the most suitable. Normally the lockers can be arranged with seating of the wooden strip topped type with shoe racks below. Such storage accommodation need only be provided for some 40 students in each room although gym classes would normally be only for 20 students at one time. Lockers should be arranged with a maximum height of about 6'6" and where arranged in rows an allowance of 5'6" should be made between rows. In addition to provision of lockers a first-aid kit store is essential. It may also be desirable to have wash-hand-basins in the changing rooms where elaborate toilet facilities are not provided.

General finishes have to withstand continual conditions of dampness and, in the case of glazing, condensation has to be considered to avoid rust and corrosion. The flooring of the changing room and drying area should not present a cold surface to bare feet, and certain forms of non-slip thermoplastic tile provide the best answer. On no account should duck boarding be used since this harbours and spreads
infectious ailments, particularly athletes' foot. The finish should be washable.

**Showers.** Undoubtedly the most satisfactory arrangement for showers in a college of this nature is that of individual cubicles for students each with a shower and separate control with one master control unit. Each compartment should be in the region of 8'0" wide by 2'9"/3'0" deep and be separated from adjoining compartments by a partition 6'0" high. The actual shower units should not be arranged as a vertical shower, but should instead be placed on the back wall at a height of 4'0"/4'6" so that a horizontal spray is provided.

The shower compartment with a provision of one shower per four students should have dual access from the changing room to allow proper circulation. Placed near the entrance to the compartment from the changing room it is normally advisable to provide one or two footbaths preferably sunk into the floor with seating. From these students would enter the showers and then proceed to the drying area and back to the changing room.
Finishes are of prime importance since they have continual wet conditions to contend with. Flooring should be able to withstand the wet conditions but remain non-slip. Generally non-slip quarry tiles are found the most satisfactory.

**Toilet Accommodation.** Easy access to the toilet facilities from the changing room is essential and planning of the unit beside the showers allows an economic layout of drainage and water supply. Provision should be made for W.C.'s, wash-hand-basins with preferably a drinking fountain, a dry-towel unit and an incinerator.

Since finishes must allow for easy cleaning the normal tiled floor and skirting is generally held as the most satisfactory.

**Drying Room.** This may be situated to serve only one changing room, generally, in this case, drying cupboards are all that is needed. On the other hand a centrally placed drying room could be planned to serve both gymnasium and outdoor sports. In the latter case it should be within easy reach of the external exit and have facilities for washing boots etc., a
slop sink is normally sufficient.

**Instructor's Room.** A separate room should be planned for the instructor, preferably off the main changing room and with easy access to the gymnasium. There should be provision for a shower and wash-hand-basin with a small equipment store. Size of the accommodation need only be in the region of 100'.

**Gymnasium Store.** This should have direct access to the gymnasium itself for the easy removal of apparatus. As large an opening as practicable is essential to allow students to carry the 'horse' and other bulky apparatus. It may be desirable to have provision for access to an open-air gymnastic area in which case the doors should be large. The most suitable type of door is that of the roller shutter design which does not take up valuable space. Fitments such as shelving and racks are essential features of the store. Where the gymnasium is to be used for dance classes, a suitable storage space for a piano will be required. Where the stores are planned underneath the gallery an open area might be provided where the piano can be used effectively without encroaching on the floor area. Where a piano is not required, pro-
provision should be made for a record player and record store.

The minimum area required for an apparatus store is 180 square feet, and the Ministry of Education (Northern Ireland) require in schools that access doors be 7'6" wide. It is recommended that the least dimension of the store should not be less than 10'0". In the event of the gymnasium being used for remedial work additional store facilities are required for special apparatus.
Changing Facilities and Cloakroom. Changing accommodation, showers and toilet facilities for the children can be based on the expected demand of a maximum of 20 children attending treatment classes at one time. Separate accommodation need not be provided for boys and girls, since classes will comprise of one group at each class.

The general planning considerations involved are similar to those provided elsewhere. Provision of toilet amenities should follow those recommended by the Ministry of Education (Northern Ireland) in schools. In all there should be approximately 2 W.C.'s (max. ht. 12") and 2 W.H.B.'s (ht. 27") provided for the class of 20 children. Several showers and a slipper bath will also be required. Careful consideration must be given to the provision of guide rails to slipper baths and shower units, since many of the children making use of them will be handicapped.

The changing room proper should be provided with clothes hooks and preferably wood strip seating with shoe racks under the seating. Provision should be made for hanging outdoor clothing, and since numbers are few
This section of the centre has two main functions to perform. Primarily, it is a Remedial clinic for children where they can receive 'after treatment' as well as corrective treatment in the form of special exercises. In addition, the section has to provide facilities in which students can put their training in school remedial exercises into practice, and the department will be, therefore, primarily used for practical classes. A general feature of the clinic is that both student and public access is necessary.

The central unit in the department is the Clinic itself. It should, in fact, be designed as a small gymnasium where the children can receive instruction,
and be able to practise various exercises. Since parents normally accompany the children to the clinic to receive advice on treatment, it is felt essential that a parents' gallery be incorporated with the hall. General requirements are in fact similar to those for the gymnasium, although in the case of the Remedial Clinic more emphasis is often placed upon orientation and the need for plenty of sunlight. It is only in the case of the larger establishments for Physical Education, with student numbers over 200, that separate accommodation becomes essential. In a college of the size under consideration, the normal gymnasium can fully satisfy the requirements when special storage and changing accommodation is made available.

The department, in addition, requires the use of a medical examination room. Planning considerations can ensure that the college Medical Examination Room be so placed that it can be used for both the students and the children attending the clinic. Where the gymnasium is used for School Remedial Exercises, changing accommodation with showers and toilets will be required in addition to those required by students.
this might be placed in the changing room itself. Coat hangers should have a maximum height of 4 feet and seating should be in the region of 12"/13" above floor level.

The overall area of accommodation required should be 15 square ft. per child, and the ceiling height need not exceed 8'0".

It is perhaps of importance to provide some form of parents' cloakroom accommodation reasonably near the gallery. This should include coat hangers and toilet facilities.
The facilities required for swimming include accommodation for changing, showers, drying and toilets in addition to the actual pond hall itself. Since the particular requirements for the ancillary accommodation are somewhat peculiar to swimming facilities, it would be difficult to envisage their use being shared with the gymnasia, games hall or assembly hall.

The main swimming hall like the gymnasium is normally a potential noise source and provision for the reduction of noise being carried to adjoining
buildings and units of the college might take the form of sound locks, instead of by complete separation of the hall from adjoining facilities.

The general placing of the unit in relation to the other collegiate facilities is also of importance when consideration is given to both heating and orientation. It is advantageous that as much sunlight as possible be obtained in the hall, not only from the obvious attraction of sunlight but with consideration of its effect on bacteria both in the water and the surrounding air. It is of value to have as extensive a window area as possible; glazed area in the region of 50% of overall pool and walk area is generally recommended, although heat loss through such areas is an important drawback. When possible it is worth considering access to lawns or gymnastic areas from the actual pool sides, however, certain precautions must be taken to prevent dirt being carried into the pond from outside. In general, side wall lighting is preferable to any form of roof lighting, which apart from having a dismal effect on the hall has the added danger of broken glass from
roof lights possibly falling on swimmers or into the pool unnoticed. In addition roof lighting has the disadvantage of being more difficult to clean than the other forms of lighting. In the positioning of artificial lighting, it is suggested that indirect lighting from side walls together with pool lights would provide the most suitable and least dangerous form of illumination.

The general space heating of the hall is of utmost importance and consideration of the high moisture content of the air is essential. Undoubtedly the most satisfactory system to be used is air conditioning, with which certain control can be had over humidity and air changes. It may be necessary for separate control to be required for the hall since it may not be in use at certain periods, when the plant for gymnasia etc. may be required.

Since the hall is primarily required for swimming and diving instruction, and training and practice in the college, little consideration need be given to galleries. Certain provisions might be made, however,
for occasional local galas, and an allowance of a 7'6" walkway round the pool edge should be adequate for temporary seating accommodation. Although it is rather desirable to provide measures to ensure that dirt etc. is not carried into the hall, it is extremely difficult if occasional galas are held, although, in any event, coaches and instructors will normally carry out their duties without changing or removing their footwear. It is, however, desirable that swimmers entering the pool from dressing rooms should be compelled to pass through a foot bath; this is most satisfactorily achieved by having the access to the pool separated from the changing rooms by a deep trough about 6' x 6' in area.

Internal finishing of the hall demands great consideration both from the cleanliness viewpoint as well as with consideration of the continually wet conditions. The floor finish of the walkways and areas at the pool side should be tiled with non-slip tiles and sloped for quick drainage of surface water. It is essential that the flooring be easily cleaned,
and particular types of grooved non-skid tiles should be chosen only after this consideration.

Quite a wide range of finishes are available from manufacturers for the lining of the pond itself. Glazed tiling has been almost universally used in this country, but glass tile, quarry tile (not glazed) and terrazzo mosaic are also available. There are certain doubts as to the suitability of the glazed tiling. One authority found that not only did the tile craze, but frequently tiles were forced from the structural backing, and several cases of the glazing shearing off the tile were discovered, presenting a source of potential danger to bathers. The latter defect may be due to stresses set up in the glazing and tile due either to temperature changes when the pond is emptied or perhaps to a normal stress due to poor insulation.

The wall finish should preferably incorporate a dado up to 6'0" high from floor level, this may be formed in tiling or possibly terrazzo mosaic. The upper part of the wall may be brickwork or concrete with or without painted or distempered finish, the prime consideration being that of the continually damp conditions.
A more satisfactory finish might be that of one of the special acoustic or insulating plasters. Ceiling finish might be exposed structural concrete or preferably finished in plaster.

The facilities will have to accommodate normal classes of approximately 40 students per class, but since the use of the facilities in hours per week is not high, a water area of 75' x 35' should be ample. The pond will have to provide for learner swimmers and divers, and accordingly depths required should range from 3'6" at the shallow end sloping to a depth of 9'0" for the last 18'0" of the pond length. The detailing of the latter depends almost entirely on the position of the main draining point of the pond.

A diving stage will be required at the deep end of the pond and should include one fixed and one spring board at heights of 1 and 3 metres. Other important detail features of the pond are the provision of a screen trough at water level, and a handrail 2" above water level should be provided on one long side of the bath edge and across the shallow end. Four sets of steps are sufficient for this size of bath, one being
placed in each corner. Steps may be formed out of the bath side or be of the vertical type counter sunk in the bath wall, the main consideration being to avoid obstruction to swimmers.

**Changing Accommodation.** The changing accommodation requirements in general are similar to those required elsewhere. There are, however, certain requirements which are peculiar to those used for swimming.

Shower accommodation need not necessarily be as elaborate as that provided in the gymnasium units, and, in planning, it is essential to consider that circulation to showers to/from changing rooms is such that students can easily use showers before entering the pond as well as immediately afterwards.

The essential differences in the design and layout of the changing room proper are concerned with finishes and changing arrangements. Particularly since the facilities are for girls, it is desirable that there should be changing box-accommodation for each student. The maximum number which would use the facilities at any one time being about 40, it is desirable to use the system of one box per bather. The box units should be
at a minimum of 3 feet centres and 5 feet deep to allow for the doors to open inwards. The partitions between the boxes should be in the region of 6'6" high and stand 6" off the floor to allow for hose cleaning. Doors need not necessarily be the full height of the partitions, a height of 4'6" is considered ample, allowing 6" clear at the bottom. The recommended materials for the construction of partitions vary considerably. The best and most expensive construction is that using teak, while terrazzo slab and metal have been used extensively. While terrazzo is normally of heavy construction the use of metal partitions involves condensation problems together with maintenance. There should be provision in the boxes for a bench seat the full width of the box, some 12" deep and 18" above floor level. Other fitments should include a mirror, a small shelf, preferably two coat hooks and a shoe rack. Some form of matting of either cork or wood slat duck boarding should also be provided in each box, particularly where a cold flooring material is used. In addition to changing boxes, small items of equipment including
several clothes ringers will be felt essential.

Floor and wall finishes have to withstand considerably more water and condensation than the normal changing rooms. Wall surfaces in general should be treated in a similar way to the main hall with a tiled dado. The floor finish should be impervious and laid with slight falls to channel drains. Where tiling is used, it is advisable to use cove tiles at skirtings to allow for easy washing and cleaning. The floor finish must be non-slip.

Ventilation in the rooms must be good, but draught proof, and since a considerable amount of condensation and steam is normally present, a ceiling height of about 10'0" is recommended, particularly where changing boxes are located.
This unit might be more aptly described as being an indoor games area. The intention of including a special games hall in the college has been the result of two main considerations. The primary intention in having the hall is to provide facilities for not only the more normal indoor games of netball, badminton etc., but also for practice and tuition by both students and instructors in such games as hockey, during the more inclement seasons of the year. It has been realised for some time that the climate in this country does not permit the full use of outdoor playing fields all year round and the inclusion of the games facilities
will help to overcome this obstacle. With a games hall in the college, the programme of tuition to students, student practice and the instruction of school children in games can take place irrespective of weather conditions. In addition, the intention of providing the hall is to free the gymnasia from games classes, and allow their facilities to be used solely for the classes for which they are equipped. The high cost of gymnasia and equipment today suggests the impracticability of providing additional gymnashium space merely to include games classes.

In essence the hall, although large in floor area, requires only the minimum of facilities. Lighting is perhaps the most important consideration. Functionally the hall requires good over all lighting both natural and artificial, and it is essential that the lighting units are at a high level both to avoid breakage and to give as much clear wall space as possible. The most satisfactory form of natural lighting is by a north-light roof with possibly high level windows. Artificial lighting requirements are similar to those in the gymnasia. It is particularly important in the hall that
both windows and lighting units are designed with protective wire netting to avoid not only breakage but danger due to falling glass in the event of damage.

The wall areas of the hall should preferably be flat and extremely durable to withstand wear and tear and avoid obstruction during games. The wall finish need only be exposed brickwork or painted brick. Perhaps most important of all is the actual floor finish. Since the hall will be in use for such games as badminton and also for hockey practice, the flooring will have to be extremely durable and easily laid out for the various games. Floor finishes which might in fact be suitable include wood strip, asphalt, cement, latex cement or rubber strip, although the latter would present considerable difficulties due to the actual jointing which could be a source of danger to players.

The acoustic properties of the hall require considerable attention due to the difficulties encountered with such large comparatively flat surfaces. The use of random patches of absorbent panels on the
wall surfaces, and the treatment of the underside of the roof area should provide the solution to the problem.

Requirements for heating, lighting, ventilating and colour finishes are similar to those for the gymnasium.

The actual dimensions of the hall are governed by the sizes required for the games. The largest dimensions required will be for the netball court, which is itself 100 feet long by 50 feet wide. Since Badminton will also be played in the Hall, a ceiling height of 25 feet is desirable. The clear Hall dimensions of 110 feet long, 60 feet wide and 25 feet high should be ample accommodation.

Ancillary accommodation required in connection with the hall will include changing accommodation for the students with showers and toilet facilities. It is felt, in addition, that a spectators' gallery to the Hall would be advantageous, both for students in demonstration classes and for use during matches. The actual requirements follow closely those outlined for the gymnasium, except in one respect, that since storage
areas and changing accommodation will be used for the outdoor activities on the playing fields, they should be planned accordingly. An additional wash room in which students can clean their boots and equipment after outdoor games should be provided close to the changing room and the exit to the playing fields.
ASSEMBLY HALL

The hall would principally function as the collegiate assembly centre, but would be used in addition for dancing classes, film shows, prize givings, public displays and amateur dramatics. It is therefore desirable that the following additional facilities are available for use with the hall, changing rooms, a green room, storage accommodation for chairs, projection box and a stage.

The general location of the hall within the college is important. It will be a source of noise when in use and it should therefore be
reasonably remote from the quieter college facilities. Since the hall will possibly be used by the public on occasions, access to it should not entail the public travelling through the main college areas. The hall itself will be required to have a minimum of two access doorways each 4'6" wide under the fire regulations.

The aspect of the hall is not a vital consideration, although it would be pleasant if planning ensured that sunlight would enter the hall at some period of the day. The general lighting of the hall, both artificial and natural, should be good. Provision is necessary for the easy darkening of the room during film shows.

Suggestions for the use of colour in schools have been made in the Ministry of Education Building Bulletin No. 9, and some of these might be applied to the hall. Although the hall will be used for dancing classes the need for keen vision is not nearly as important as in the gymnasium, and the decoration might therefore be treated more in character with its function as an assembly hall. In general, the decoration should produce an atmosphere of dignity and
spaciousness. Considerable contrast is appropriate although strong colour should be confined to small areas adjacent to areas of more neutral colours, and preferably not close to clerestory window openings. The use of colour pattern is advisable to give additional richness to the interior. The high ceiling of the hall should permit the use of colour on the ceiling, and one need not be restricted to white.

The ventilation of the hall should be of a high quality. Where artificial ventilation is uneconomic, it is desirable that the hall should have adequate natural cross ventilation and window heads should be carried as near ceiling level as possible.

Since dancing classes will be held in the hall, the flooring should preferably be of a semi-resilient nature with a hardwood strip finish, similar to that provided in the gymnasium. The other functions of the hall suggest that certain acoustic properties of the hall will be desirable. Reasonable acoustic conditions should be obtained initially by the use of lime plaster wall finishes in preference to that
of hardwall plaster, the provision of a reflective dado, and the possible lining of the rear wall with absorbent material. A flat ceiling is in addition considered desirable.

If the stage will be required for dramatic work, it should be in the region of 20 feet deep, and preferably the full width of the hall. Although a permanent proscenium is not essential it would appear to be desirable. Where changing accommodation is available for stage use it is essential that it is planned to provide direct access to the back stage area. Storage accommodation for both stage equipment and chairs will be required in the hall. This might in fact be provided below the stage itself, where the working headroom should be at least 6'6". The actual height of the stage front should be about 3'6" above general floor level. Provision will have to be made for a film screen somewhere in the stage area. The rear stage wall, painted white, might be sufficient for film shows. The alternative is to provide a suspended screen either at the proscenium opening or in the centre of the stage. Other stage fitments might
include a radio loudspeaker and stage lighting equipment; the latter might include footlights, two suspended top battens and one or two flood lights fixed in the hall itself. The control for the lighting fixtures should be in or near the stage.

A projection box should be planned at the rear of the hall. If the box itself projects into the hall a minimum of 10 feet headroom should be allowed below it. The box should have a minimum floor area of 100 square feet, with a minimum height and width of 8 and 10 feet respectively. Although the safeguards required for the projection box are not elaborate, direct access to the open air from the box is essential.

Changing room accommodation provided for other units should be planned for use with the hall and cloakroom requirements for the public can be met by the use of conveniently placed common rooms or other available facilities. It is not necessary to provide special accommodation for the latter since the facilities will not be used frequently.
The actual size of the assembly hall is dictated by both its use as an assembly area and as a dancing class area. Dimensions in the region of 70 feet long by 40 feet wide, including the stage area, with a ceiling height of 18-20 feet should be adequate. These should allow a maximum theoretical seating capacity of 250 persons, and also be sufficient for dancing classes in the region of 20 persons per class.
GENERAL DESIGN INFORMATION

PART II RESIDENTIAL UNITS
DINING FACILITIES

The dining facilities should be planned to serve both the college and the residence, duplication of the accommodation would be both extravagant and costly. It is generally felt that separate staff and student dining rooms are undesirable, and that a communal dining hall will lead to a better relationship between student and staff members, and will also allow for supervision when necessary. The actual numbers using the dining room would be in the region of 150 persons for each meal in the day. There, therefore, appears to be little justification for breaking up the meals into two sessions per meal and accommodation should therefore allow for all persons
to have their meal at the one sitting. Of the two normal methods of serving meals the self-service system is undoubtedly the most satisfactory for the college, since it reduces the required number of kitchen staff to the minimum, and is not only more economical to run, but allows for easier management of the staff employed.

The use of the dining hall for other functions should be considered in early planning. The hall might be designed for use as a social hall where small college dances and other social functions could take place. The only additional facilities which would be required would be storage space for chairs and tables.

Although the positioning of the dining area is largely dictated by the relative planning of kitchen accommodation and service access, it is essential that the dining hall itself should receive as much sunlight as possible during the appropriate periods of the day and enjoy at the same time both privacy and pleasant surroundings. It is of importance, however, that the dining hall and particularly the
kitchen should be zoned with the other noisier facilities and kept remote from the other rooms in which relative peace is desirable.

The ventilation of the hall should be good and preferably cross ventilation employed. There seems to be little evidence of special preferences in the methods of heating dining halls, and only certain design details such as full wall glazing seems to dictate the use of certain heating methods.

The actual finishes used in the dining hall are largely dictated by function, the necessity for noise reduction, and cleanliness. The use of the area for dancing suggests that either hardwood strip, parquet or hardwood block should be selected for the floor finish so giving not only a durable and pleasant floor but one which might be easily cleaned. Consideration will have to be given to the finishes on walls and the ceiling area. The use of the more sound absorbent wall plasters or panels on the ceiling particularly will contribute to a large reduction of the noise created during meal periods.

Since the hall, as indeed the entire residence
itself, will be the temporary home of both students and staff considerable attention has to be given to the interior decoration. The use of light and gay colour schemes with small areas of contrasting colours may be used, but it is desirable that an intimate and sophisticated atmosphere is created with the decorative treatment.

The actual area of the dining hall required for 150 persons depends largely upon the intended seating arrangements. There is no apparent reason why this accommodation should not take the form of long tables seating 8 to 10 persons, in which case an area of 10-15 square feet per person can be provided in the planning layout.

The use of the self-service system necessitates the very close proximity of the kitchen accommodation to the dining hall. It would seem appropriate that the kitchen unit should also include kitchen staff facilities, including a cloakroom and dining/common room. The design details and general requirements of the kitchen accommodation are covered to a large extent by the Ministry of Education Building Bulletin, No. 11.
It suffices here to note that the area of kitchen accommodation required to serve 150 meals at one sitting is in the region of 650 square feet.
COMMON ROOMS

In the residence it is basically essential that the recreational areas for staff and student members are completely separate.

In general, the Common room accommodation will be required to cover a variety of purposes, and this suggests that the facilities should be subdivided into units, each designed for a certain function, e.g. reading rooms, sitting rooms, games room, television and radio room.

By breaking up the accommodation it will be possible to zone the various units according to both function and noise. This will permit the quieter reading, writing and sitting rooms to be
placed close to the bedroom units while the noisier games and radio accommodation can be located further from the sleeping quarters, and still be central to the residence as a whole. The cost of equipment including such items as a table tennis table, a radio and television set, suggests that one central unit of accommodation for their use would be appropriate, whereas items such as reading rooms etc. could be broken up into smaller units to serve separate sections of the residence, and thus obtain a more homely and intimate form of communal accommodation.

The aspect, prospect and relative privacy of the common rooms are of vital importance, much more so where they are used for reading, writing or general relaxation. But the actual orientation of the rooms must be considered on the basis of the fact that they will mainly be in use in afternoons and evenings during most of the week.

Equally important in the planning of the common rooms is the heating, ventilation and acoustic insulation, the latter being particularly important. Toilet facilities should be provided adjacent to the
common room facilities. Provision should be made for the inclusion of small kitchen/pantry units with the sitting rooms.

The total area of common room accommodation is based on the recommended area of 20/25 square feet per member. But in the case of staff accommodation a minimum area of 300 square feet should be allowed.
BEDROOM UNITS

The core of the problem presented in designing a residence lies in the grouping together of the study bedrooms. The success of the residence as the temporary home to those living there relies mainly on the planning relationship of these units. The standard method of grouping bedrooms along both sides of long corridors is most unsatisfactory, and produces inevitably an institutional and dismal atmosphere in the hostel. The only answer to the problem is to break the total study bedrooms into groups or houses, the number of which might be dictated by the natural sections into which the college falls, i.e. by college
year classes or subdivisions of these classes.

**Student Quarters.** Following the suggestions of several college authorities, double study bedrooms should be provided for first-year students at the college with single study bedrooms for the students in the later years. The areas of accommodation recommended by some authorities, including the Scottish Housing Advisory Committee in their report on Housing for Special Groups, are 90-110 square feet for single study bedrooms, and approximately 140 square feet for double rooms. A ceiling height of 7'6" in the rooms should be adequate.

Quietness and privacy are primary considerations in the planning of the bedrooms within the hostel. There are opinions which favour the placing of the rooms above ground floor level, particularly in girls' residences, to provide the desirable amount of privacy to occupants. Planning should in addition attempt to provide each room with a good aspect and prospect, but in so doing consideration must be given to the actual times of the day during which
The rooms are occupied. The large window areas required for good lighting conditions can also provide ample natural ventilation to the rooms.

Central heating is undoubtedly the most satisfactory method of heating the individual rooms, and this can be linked up to provide such fittings as hot towel rails etc. which have now become recognised as essential. The provision of wash hand basins in each room is now becoming standard design practice, as is, indeed, the provision of built-in cupboards and wardrobe accommodation.

In planning the shape and layout of individual rooms, it is worth noting that the following furniture will be required: single bed 6'6" x 3'0"; a desk 3' x 2'; approx. 3' run of bookshelves 9" deep; a single chair 18" x 18"; an easy chair 2' x 2'; and a dressing chest 3' x 18".

The importance of the interior decoration of study bedrooms cannot be overlooked. The use of a number of different interior designs will help to produce a more homely atmosphere, as well as inspire the students with pride in their rooms.
Staff Quarters. The living quarters for the main body of the staff need differ only in size from that provided for the students. The two senior staff members and the Residence Warden should be provided with a small flat each, and the remainder of the staff with bed-sitting rooms, preferably with their own bathroom facilities.

Although it is desirable to plan the staff accommodation separate from the student rooms, it is nevertheless necessary for them to be in a position where they can exercise some control over students, either during the normal course of events or during emergencies.
GENERAL DESIGN INFORMATION

PART III OUTDOOR FACILITIES
PLAYING FIELDS

Detailed information on the requirements for playing fields are given in several publications, including the Ministry of Education Building Bulletin, No. 10.

The main considerations in the design of playing fields are the orientation, the gradient, the drainage and the surface finish of the pitches. In general, playing fields need not be absolutely flat, in fact, if they are, serious drainage difficulties will be encountered. The ideal uniform fall for most pitches is accepted as being 1 in 80,
but where the natural fall is uniform and not steeper than 1 in 50 no adjustments need be made. Where grading is inevitable a uniform fall of 1 in 60 should be obtained.

The problem of drainage on the proposed college site will require considerable attention due to the waterlogged nature of the soil. This difficulty can be partially overcome with the playing fields by using hard porous pitches where possible, and in this way provide surface finishes which can be used at all times of the year, except under the worst possible conditions. Several types of hard porous surfaces have been tried for hard tennis courts, hockey pitches, netball courts and athletic tracks with a large amount of success. One of the most successful variations of the hard surface is the blaesed finish which was developed in the Glasgow area. In the blaesed pitch the foundation layer of ash is covered with a layer of red ash, on top of which is laid an inch of hard blaes or well burnt red shale, blended with brick dust. The surface is consolidated and rolled to produce the final finish.
FACTORS INFLUENCING THE DESIGN

being for the most part moderately flat. It rises steeply from the main trunk road on the south-east to about 15 feet above road level and the contour smooth out after approximately 150 feet to an average gradient of 3 feet in 100 feet. The principal gradient on the site runs from the north-west to the south-east boundary on the trunk road, the exception to this being that of the eastern portion of the grounds which have a predominant fall to the south.

A small stream, which has its origin north of the village of Jordanstown, enters the site on the north-west. One branch of the stream follows part
THE SITE: GENERAL

Broadly speaking, the site may be described as being for the most part moderately flat. It rises steeply from the main trunk road on the south-east to about 15 feet above road level and the contours smooth out after approximately 150 feet to an average gradient of 3 feet in 100 feet. The principle gradient on the site runs from the north-west to the south-east boundary on the trunk road, the exception to this being that of the eastern portion of the grounds which have a predominant fall to the south.

A small stream, which has its origin north of the village of Jordanstown, enters the site on the north west. One branch of the stream follows part
of the north-west boundary before joining forces with the main stream at the point where it enters the site. The stream flows in a south easterly direction through the site in a small natural bed and tends to define the eastern portion of the site from the main grounds. Almost entirely throughout the site the stream is lined by young trees. Before leaving the site, the stream flows into a small natural bowl from where it flows under the main road towards the sea. The stream is somewhat hidden in bracken for the most part of its length, but may have possibilities of becoming a rather attractive feature of the site with careful landscape treatment.

The soil on the site may be described as being in general stiff clay. Fuller details of the soil types are shown on the site diagram. The stream provides the natural drainage of the areas of the site in its near vicinity, but elsewhere the flatter areas tend to become heavily waterlogged during the wetter seasons of the year.

Existing trees on the site are numerous, and seem to have been originally planted to provide
privacy and shelter to Dalriada House itself, and elsewhere to define field boundaries or separate the house land from the original agricultural land. Several large clumps of trees, particularly Scots fir are found on the south-east corner of the site, and the grouping thins out to line the south-westerly side of the main drive up to the house, thus providing both shelter and privacy to the house and lawns. Quite a number of singly planted trees surround the house on the easterly and westerly sides and the rear service drive is lined on its north-west side by carefully spaced evergreens. The latter link-up with trees grouped round the old farm buildings and apple orchard to the north of the house. Many of the existing trees surrounding the house are mature, and while they are decidedly worth retention, provision will have to be made to replace them in future years. Elsewhere on the site trees have tended to define field boundaries. The two most important examples of which are the trees which line the stream on its way through the site and the carefully planted line of Scots Fir which defines the boundary of the area in
the north-west of the site.

The old house is enclosed on three sides by lawns which have been levelled on the site. Another interesting feature of the existing layout is the artificial vegetable garden which has been formed at the rear of the house between it and the service drive. The garden is enclosed by a 10 foot high wall and has been laid with a drier soil than that of the site itself, and has been laid on a boulder and stone base to provide adequate natural drainage of surface water. The garden shows every sign of being well cared for, and is still productive. Although it might not be at all feasible to retain it, as it stands at present, it may form a source of good productive soil for any small gardens which might be incorporated in the new layout.

It has been mentioned already that the land to the north and east of the site is mainly pasture land, and although it has now been classified as a residential development area, it is liable to remain agricultural for some time to come. The view from the site to the north and to the west is pleasant and interesting, and
is dominated by the hills of the Antrim plateau extending from Belfast eastwards, some three to four miles to the north of the site. Knockagh hill to the north forms an interesting and dominating feature on the skyline. The hill which is crested by the County Antrim War Memorial tower is a familiar landmark on the shores of Belfast Lough. The landscape surrounding the rest of the site is largely dominated by small groups of trees which provide privacy to the numerous private dwellings and shelter to private gardens. The view to the west can be very attractive in the afternoon sun, trees silhouetted in the foreground against the bright sky with the hills around Shaw's Bridge in the near distance and Cave Hill in the background. Southwards from the site there is the view of the beautiful County Down Hills on the southern shores of the lough, and on finer days the view can extend to Strangford Lough, and the surrounding County Down countryside.

Climatically, the district varies little from that of the general conditions recorded for Northern Ireland as a whole. A recent Meteorological report describes
the climate as temperate, equable, humid, rather cloudy with plentiful rainfall at all times of the year, and with prevailing South-Westerly winds.

The following meteorological information has been made available by the weather station at Aldergrove, some 12 miles north of the site, and gives a general indication of the more important climatic conditions.

Percentage frequency of winds over the whole year:

N. 9 : moist  S.E. 10 : moist  W. 12 : wet
N.E. 6 : dry   S.  20 : (dry summer  N.W. 10 : moist
               moist winter   S.W. 17 : wet   Calms 6

Average monthly rainfall in inches:

3.1  2.2  2.2  2.0  1.8  2.9  3.8  3.3  2.8  3.9  3.3  3.3

This gives a total yearly rainfall of 34.6 inches.

The average monthly temperature can vary from 22°F in January up to 74°F in June, July and August. The average daily Bright Sunshine figure for the Province is about 3½ hours.
Aerial View of the Site.
DETAIL FEATURES OF THE SITE

Access. The site has the advantage of already having dual access. The main drive to the house opens off the main Belfast to Carrickfergus trunk road, some 170 feet from the line of the south-western boundary and 350 feet from Station road to the south-west. The drive which is some 12 feet wide cuts into the steep slope of the natural contours at the junction with the main road. The existence of access from this point to the site is of importance when consideration is given to the placing of the new buildings on the site. The construction of an alternative access way from the trunk road would obviously be a costly business. Rear access to the grounds is also available in the form of a service avenue which opens off Station Road some 520 feet from the rear of the site and which extends for some 600 feet into the site in a north-easterly direction. This service road is also approximately 12 feet in width. Considerable economies can be achieved by making use of these existing access roads to as full
an extent as possible. Their use will of course dictate to a large extent the planning of the Centre's individual units on the site.

**Services.** All the services to the site are located in the two adjoining roads, Station Road and the Belfast/Carrickfergus trunk road. The only service which is at present overhead is telephone communications, but this could be superceded in the new scheme by underground cables. Although the services have been noted on the site plan, the information might be expanded here.

**Water Supply** is provided by the Belfast Waterworks Commissioners and, although a water main is located under both roadways, the supply to the existing house is from the water main under the footpath on the north side of the trunk road. The connection to the house is at the drive entrance at a depth of 2'6" below footpath level. The supply pipe to the house runs under the drive to the house.

**The Public Sewer** which serves the site belongs to the Belfast Rural District Council who have a small sewage
works and pumping station on land opposite the junction of Station Road and the main road. The existing drains from Dalriada House run down the site along side an old boundary, and connect into the public sewer in the trunk road some 200 feet north west of the drive. The Public Sewer runs towards Station Road where it picks up the Station Road sewer and flows into the disposal works. The Public Sewer in the main road is 8 feet below road level.

The Electricity Supply is provided in the area by the Belfast Corporation Electricity Department. The underground main supply cable runs down Station Road at a depth of 18" below the pavement level. The existing supply cable to the house runs under the service drive to the courtyard from where it turns right into the existing building.

The Gas Supply to the area is provided by the Belfast Corporation Gas Department. The gas main which supplies Station Road has a connection to the site. The supply pipe runs under the service drive from Station Road, and under the courtyard from where it connects to the
meters inside the house.

The Fire Authority for the area is the Northern Ireland Fire Authority who have their control centre in Lisburn.

**Prospect, Aspect and Nuisance.** Both the northern and eastern boundaries to the site have been described as adjoining reasonably level pasture land and having views in those directions of the hills of the Antrim Plateau. While the distant views to both the south-east and south-west are extremely good, the boundaries to the site on these sides are lined by the rear gardens of housing which borders the site. Trees tend to form a screen to the backgardens on the south and south-west, south of the service drive, but the rear of the housing on the west, north of the service drive, is completely open to the site. The latter housing on Station Road particularly encroaches on the privacy which will be desirable for the residential quarters of the centre. In general, by landscaping much more privacy may be obtained for the site.
The orientation considered desirable for most of the units in the centre is mainly south and south west, and, although the slope on the site will give an almost unobstructed view of the lough to the south, the housing which borders the site does present a problem which can only be solved by landscaping.

**Exposure.** The prevailing winds in the area around Jordanstown are mainly southerly and south-westerly, and these are the winds which in winter months carry a large proportion of the rain. The previous landowners of the estate had made full use of tree planting to provide shelter to the house and gardens in what must have been, at one time, an exposed area. The trees growing on the adjoining estate to the south west, and those planted along the western boundary of the site, provide a certain amount of shelter to the site, particularly in the area adjacent to Station Road. The more exposed portion of the site is largely the area east of the stream which due to its slope and altitude is virtually unsheltered against the prevailing winds.
SITE STRUCTURE

The details recorded on the various diagrams are briefly listed below:

UNDER LYING ROCK: SANDSTONE

SUBSOIL: MAINLY STONY CLAY AND BOULDER CLAY; the depth varies from a few feet up to eight feet in places.

TOP SOIL: STIFF MOIST CLAY
SURVEY OF EXISTING SITE VEGETATION

TREES:
Scots Pine
Corsican Pine
Horse Chestnut
Silver Birch
Rowan
Lime
Spruce
Willow

SHRUBS AND BUSHES:
Rhododendron
Cotoneaster
Flowering Currant
Escallonia
Prunica
Forsythia
Kalmia
Herbaceous plants
Syringa
Pernettya  
Japanese Cherry Tree  
Weeping Laburnum  
Holly  
Laurel  

It is worth noting that the following trees are found growing in the neighbourhood of the site.  

Cedar of Lebanon  
Alder  
Elm  
Wych Elm  
Common Oak  
Aspen  
Italian Poplar  
White willow  
Abele
SITE ORIENTATION
PLANNING/ZONING
COLLEGIATE BUILDINGS
RESIDENTIAL BUILDINGS
SERVICE COURT
ENTRANCE COURT

SITE PLANNING ANALYSIS
HEATING, LIGHTING AND VENTILATION

The Ministry of Education (Northern Ireland) recommend certain standards for the heating, lighting and ventilation of educational establishments. These recommendations are outlined in the following tables.

HEATING AND VENTILATION

<table>
<thead>
<tr>
<th>UNITS</th>
<th>TEMP. IN FAHRENHEIT: NO. OF AIR CHANGES/HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Rooms</td>
<td>62°</td>
</tr>
<tr>
<td>Assembly Halls*</td>
<td>57°</td>
</tr>
<tr>
<td>Dining Rooms</td>
<td>57°</td>
</tr>
<tr>
<td>Gymnasia</td>
<td>55°</td>
</tr>
<tr>
<td>Staff Rooms</td>
<td>62°</td>
</tr>
<tr>
<td>Changing Rooms</td>
<td>65°</td>
</tr>
<tr>
<td>Cloakrooms &amp; Corridors</td>
<td>55°</td>
</tr>
<tr>
<td>Lavatories</td>
<td>-</td>
</tr>
<tr>
<td>Medical Inspection Room</td>
<td>65°</td>
</tr>
<tr>
<td>Drying Rooms</td>
<td>80°</td>
</tr>
<tr>
<td>Kitchens</td>
<td>-</td>
</tr>
</tbody>
</table>

*Evening Activities: installation of individual circuits with adequate values for control purposes.
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>AREA TO BE LIGHTED</th>
<th>WORKING PLANE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary Classroom</td>
<td>Area of desks</td>
<td>2'6&quot; above floor</td>
</tr>
<tr>
<td>&quot;</td>
<td>Blackboard</td>
<td>Whole of board</td>
</tr>
<tr>
<td>Practical Subjects Room</td>
<td>Body of Room</td>
<td>2'6&quot; above floor</td>
</tr>
<tr>
<td>Assembly Hall</td>
<td>Body of Room</td>
<td>floor</td>
</tr>
<tr>
<td>Gymnasia</td>
<td>Body of Room</td>
<td>floor</td>
</tr>
<tr>
<td>Lavatories:</td>
<td>Body of Room</td>
<td>floor</td>
</tr>
<tr>
<td>W.C.'s and corridors with</td>
<td>Compartment</td>
<td>floor</td>
</tr>
<tr>
<td>low ceilings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stores</td>
<td>Body of Room</td>
<td>floor</td>
</tr>
<tr>
<td>Library</td>
<td>Whole of Room</td>
<td>2'6&quot; above floor</td>
</tr>
<tr>
<td>Dining Hall</td>
<td>Body of Room</td>
<td>floor</td>
</tr>
<tr>
<td>School Meals Kitchen</td>
<td>Body of Room</td>
<td>2'6&quot; above floor</td>
</tr>
</tbody>
</table>
**LIGHTING TABLE (CONT.)**

<table>
<thead>
<tr>
<th></th>
<th>RECOMMENDED ARTIFICIAL ILLUMINATION IN LUMENS PER SQ. FT.</th>
<th>SUITABLE FITTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>*5</td>
<td>*Simple types of diffuser reflector</td>
</tr>
<tr>
<td>(2)</td>
<td>*5</td>
<td>Elliptical angle</td>
</tr>
<tr>
<td>(3)</td>
<td>10</td>
<td>General diffusing (dispersive reflectors in workshop)</td>
</tr>
<tr>
<td>(4)</td>
<td>8</td>
<td>General diffusing</td>
</tr>
<tr>
<td>(5)</td>
<td>8</td>
<td>See B.S. Codes of Practice</td>
</tr>
<tr>
<td>(6)</td>
<td>3</td>
<td>Prismatic Bulkhead</td>
</tr>
<tr>
<td>(7)</td>
<td>3</td>
<td>Plain Pendant TRS Flexible - Plastic Shade</td>
</tr>
<tr>
<td>(8)</td>
<td>*5</td>
<td>*Plastic dispersive reflectors</td>
</tr>
<tr>
<td>(9)</td>
<td>6</td>
<td>Simple type of diffuser reflector</td>
</tr>
<tr>
<td>(10)</td>
<td>8</td>
<td>Vitreous enamelled dispersive reflectors or white plastic dispersive reflectors</td>
</tr>
</tbody>
</table>

*Where the rooms are to be used at night, the artificial illumination should be increased to 10 l/0' and general diffusing fittings should be used.*
<table>
<thead>
<tr>
<th>No.</th>
<th>Provision for Apparatus</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Socket outlet for projector, radio</td>
<td>Mounting of fittings should prevent their accidental focussing on desk area</td>
</tr>
<tr>
<td>(2)</td>
<td>To suit equipment installed</td>
<td>Socket outlets should be mounted at height of 4'6&quot; and should be placed well clear of wash basins and sinks. In workshops the use of portable mains voltage equipment is undesirable</td>
</tr>
<tr>
<td>(3)</td>
<td>Socket outlets for projector and associated sound equipment. Socket outlet for radio. Where a fixed stage is provided an outlet for stage lighting may be installed</td>
<td>The appropriate bye-laws relating to lighting should be observed where premises are to be used for public entertainment</td>
</tr>
<tr>
<td>(4)</td>
<td>To suit equipment to be installed</td>
<td>Provision should be made, where necessary, for a supply to Badminton lighting fittings</td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td>Plain pendants with white plastic dispersive reflectors should be used in corridors of normal height</td>
</tr>
<tr>
<td>PROVISION FOR APPARATUS</td>
<td>REMARKS</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) Socket outlet for vacuum cleaners</td>
<td>The recommendations given are for libraries with shelving around walls only. Where bookshelves are arranged in close parallel rows, special lighting giving an illumination of 3 1/0' on vertical surfaces should be provided.</td>
<td></td>
</tr>
<tr>
<td>(9)</td>
<td>Where Dining Hall is to serve also as Assembly Hall, the recommendations for Assembly Hall should be adopted.</td>
<td></td>
</tr>
<tr>
<td>(10) To suit equipment installed</td>
<td>Switches should, where possible, be placed well clear of basins and sinks. The use of socket outlets should be avoided. Equipment should be coupled direct to conduit system wherever possible.</td>
<td></td>
</tr>
</tbody>
</table>
SCHEDULE OF ACCOMMODATION

1. ASSEMBLY HALL  2,200 sq. ft.
in addition a stage,
changing facilities
storage space

2. CAFETERIA  6,500 sq. ft.
with changing accommodation
storage space

3. GYMNASIUM  1/2,000 sq. ft.
apparatus stores  180 sq. ft.
instructor's room  150 sq. ft.
spectators' gallery

4. CHANGING ROOMS  520 sq. ft.
shower
drying facilities

5. SHOWING ROOM  75' x 35'
water, gas
changing accommodation
drying facilities
showers
gallery to seat 40
ACCOMMODATION for 120 (3 year course) and 20 (one year course) students and 14 Staff members.

1. ASSEMBLY HALL 2,800 sq. ft.
   - in addition a stage
   - changing facilities
   - storage space

2. GAMES HALL 6,500 sq. ft.
   - with changing accommodation
   - storage space

3. GYMNASIA 3/gymnasium 3/2,800 sq. ft.
   - apparatus stores 180 sq. ft.
   - Instructor's room 150 sq. ft.
   - Spectators' Gallery

4. CHANGING ROOMS 320 sq. ft./gym
   - showers
   - drying facilities

5. SWIMMING POND water area 75' x 35'
   - changing accommodation
   - drying facilities
   - showers
   - gallery to seat 40
6. LABORATORY
   part of the floor area
to be used for apparatus
   700 sq. ft.

7. LECTURE HALL to seat 40
   with preparation room
   480 sq. ft.

8. SMALL CLASS ROOM two rooms to
   seat 20 each
   store to each
   2/400 sq. ft.
   120 sq. ft. min.

9. LIBRARY AND READING ROOM
   Librarian's room
   Book store
   600 sq. ft.
   100 sq. ft.
   100 sq. ft.

10. ENTRANCE HALL to be used as a
     permanent museum

1. REMEDIAL HALL
   cloakroom and showers
   for the children
   2,800 sq. ft.
   320 sq. ft.

2. MEDICAL INSPECTION ROOM
   changing cubicles
   200 sq. ft.
1. OFFICES
   (a) Principal's Room
   (b) Deputy Principal's Room
   (c) General Office

2. WAITING ROOM

3. STAFF COMMON ROOM AND STUDY

4. SENIOR LECTURERS' ROOMS / 6

5. S.R.C. ROOM

6. CLEANERS' STORES
   Slop sink, broom cupboards

7. TOILET ACCOMMODATION to scale

PLAYING FIELDS

A. HOCKEY PITCHES
   1/ grass  
   2/ blaesed
   300' x 180'

B. LACROSSE PITCHES
   2 in number
   2/ 360' x 210'

C. TENNIS COURTS
   4/ hard courts
   2/ grass courts
   6/ 120' x 60'
D. NETBALL COURTS 4/superimposed on tennis courts 4/100' x 50'
E. RUNNING TRACK 5/laps/mile
F. JUMPING PITS 2/high jump 2/long jump
G. DISCUS CIRCLE
H. JAVELIN AREA
I. CRICKET SQUARE 80' x 80'
J. OPEN AIR GYMNASTIC AREA

RESIDENTIAL QUARTERS

1. ENTRANCE HALL with provision for telephone kiosks and office

2. STUDENT STUDY BEDROOMS
   20/double 150 sq. ft. each
   80/single 120 sq. ft. each

3. STAFF QUARTERS
   10/bed sitting rooms 200 sq. ft. each
   2/self contained flatlets with spare bedroom
4. WARDEN'S QUARTERS
   self contained flatlet

5. WARDEN'S OFFICE 100 sq. ft.

6. STUDENT COMMON ROOMS 25 sq. ft./person

7. STAFF COMMON ROOM 400 sq. ft.

8. DINING HALL 1,500 sq. ft.
   with kitchens and storage 650 sq. ft.
   staff dining/common room 150 sq. ft.
   and cloakroom

9. SICK BAY 700 sq. ft.
   one general room and
   an isolation room
   small dispensary,
   bathroom, kitchenette

10. NURSES' QUARTERS 200 sq. ft.
    bed sitting room
    with bathroom and kitchenette

11. STUDENT AND STAFF BATHROOMS and
    toilet facilities to scale
OUTLINE SPECIFICATION

AND ESTIMATE OF COST
Site Work and Excavation. Existing trees, bushes and shrubbery which are to be retained should be adequately protected against damage during building operations. All existing vegetation which has not to be retained should be cleared and the surface of the site of the new buildings and pathways etc. should be excavated to an average depth of 9". Top soil should be carted from the site and dumped in small piles for later use. All turf must be stripped, rolled and stacked. Excavate to the required depth for heating chamber, plant house and bath of Swimming Pond.
Foundations. Foundations are to be formed by short bore piles with reinforced concrete beam foundations formed in situ. The piling work is to be carried out by the Franki Compressed Pile Company Limited.

Main Structural Elements. The single storey staff quarters in the residence are of load bearing construction with 4\(\frac{1}{2}\)" and 9" load bearing dividing walls. The Games Hall is to be constructed with steel frame with welded steel lattice girder north light roof construction.

The remaining building units are to be framed in Reinforced Concrete. The frame is to be precast high strength concrete. The precast units are to be assembled and all joints formed on the site. The stanchion units for the residential buildings have been restricted to 9" x 9" cross section, while Beam units are required in three cross sectional profiles. Stanchion units to be used in the collegiate buildings are limited to two cross sectional dimensions.

Structural floor on the ground floor throughout the centre is to be 1:2:4 concrete cast in situ. All
other structural floor elements and structural roof elements are to be formed in precast (Bison Prestressed/ Pierhead x7 Prestressed) floor planks. The jointing between floor beam ends and precast main beams is to be cast in situ and reinforced. See diagrams for structural system.

Roofing finish is to be 3 ply bitumenous felt laid on screed to fall. Roof finish to be covered with marble chips on all units except house units which should be finished with a proprietary brand of roof tiling.

Panel Walls/Residence. The 3' high dwarf panel walls in the house units are to be constructed with a 4½" blue brick outer skin using either Staffordshire Blues or bricks of a similar colour, a two inch air space and a backing of 3" breeze walling. Wall panels on the ground floor of the residence are to be selected sand lime facing bricks or Suffolk Whites. Mortar used with sand lime bricks must be lime mortar (1:2:9). Brick courses should be laid at 4 courses to 1'1½"
with recessed jointing. Other wall panels are to be coursed at 1'0"/4 courses. Facia to house units, dining hall, kitchens and sick bay units are to be faced with 1" Portland stone facing slabs cramped and dowelled to structural support. Facia to other single storey units is to be faced with blue brickwork.

Panel Walls/Collegiate Buildings. All external walls to changing rooms, gymnasia, Swimming Pond, Games Hall, Assembly Hall and Staff Common Room are to be of cavity construction in sand lime or Suffolk White Bricks. Mortar mix must be 1:2:9 lime and built 4 courses 1'1½". All wall internal surfaces except in sections of the Swimming Pond and Assembly Hall are to be flush pointed and brick face left exposed. The classroom and administrative block of the college is to have a common brick cavity walling faced with 2" Portland stone facing slab except store room high level panels and the panel wall of the lecture theatre which is to be faced with blue brick internally and
externally. The facia at roof level is to be faced in blue brick. On the ground floor the dwarf walling to the administrative offices is to be of cavity wall construction faced with sand lime or Suffolk Whites brickwork. The south west wall of the entrance hall is to be formed in 11" cavity walling using blue bricks facing externally and internally. The internal finishing to the remaining wall of the entrance hall is to be panelled in hardwood. Internal finishes elsewhere in the buildings are to be lime plaster finished.

**Internal Partitions/Residence.** Internal partitions in the house units on the ground floor shall be of 4" breeze block construction with plaster finish on both faces, and 4\(\frac{1}{2}\) sand lime or Suffolk White with surface exposed. Partitions on the bedroom floors shall be 3" 'Paramount' hollow gypsum plaster panels finished with a skim coat of plaster on each face. Partitions elsewhere in the residence shall be either 4" breeze block construction, 4\(\frac{1}{2}\)" or 9" brick.
Internal Partitions/College. All internal partitions in the administration floor shall be of $4\frac{1}{2}''$ common brick construction with lime plaster finish, unless indicated otherwise. Partition walls on the class room floor shall be formed in 4'' breeze blocks with wire mesh reinforcement.

Staircases. All main staircase units are to be constructed in precast concrete units, assembled on the site and finished with hardwood treads having open risers. The small staircases providing access to galleries in the college buildings are to be constructed entirely of well seasoned Columbian Pine finished with plastic varnish.

Covered Ways. Canopy to the covered ways are to be constructed with light steel tubular columns and steel joists with softwood secondary joists. Facia to be formed in timber, soffit constructed in T & G softwood boarding. Roof finish to be of three ply bitumenous felt with marble chip topping laid on
3/4" softwood sarking.

Paving. The covered way in the residence to be paved in 2" thick concrete paving slabs. The external court in the college to be paved except for the edging which should be laid with random areas of cobble stones and shrub beds.

Glazing Units. Roof glazing members to be formed with structural upstand and covered with standard rectangular dome lights.

General glazing to be carried out in 3/16" and 1/4" plate glass. Glazing to all ground floor external glass walls and door panels in the college to be ¼" Georgian wired plate glass.

Window Units. All window frames in fixed and opening units, cills etc. to be of Afrormosia hardwood, sanded and finished with two coats of plastic varnish.
Services. All services are to be connected to the existing service mains on the site.

Heating. General heating system is to be high pressure hot water provided by gas fired boiler units. Heating to the residence is to be provided by a ring main carried in floor ducting and connected up to calorifier units in each house unit. Heating elements are to be floor panel heating in all units except the Gymnasia, Swimming Pond, Assembly Hall and Games Hall where heating elements are radiant panels together with small air condition units.

Playing Fields. Playing field areas are to be graded where necessary to a uniform overall gradient of 1:60 and land drains laid 12" below turf surface.

Blaesed Pitches should be constructed on a foundation layer of ash, covered with a layer of red ash consolidated by rolling to a depth of $\frac{1}{2}$". This should be followed by a uniform 1" layer of hard blaes blinded with brick dust rolled, watered and brushed to give a satisfactory surface.
<table>
<thead>
<tr>
<th>RESIDENTIAL UNITS</th>
<th>FLOORING</th>
<th>WALLING</th>
<th>CEILING</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td>Thermoplastic tiling</td>
<td>(1) Exposed brick</td>
<td>Plaster on suspended metal lathing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) Lime plaster laid in three coats</td>
<td></td>
</tr>
<tr>
<td>DINING HALL</td>
<td>Hardwood strip</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>KITCHENS</td>
<td>Quarry tiles</td>
<td>Exposed brickwork painted finish</td>
<td>Absorbent plaster</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COLLEGIATE UNITS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GYMNASIA</td>
<td>Rift sawn British Columbian Pine</td>
<td>Exposed brickwork</td>
<td>Sprayed limpet asbestos on structural roof</td>
</tr>
<tr>
<td>SWIMMING POND</td>
<td>Non Slip Tiling</td>
<td>Dado of tiles</td>
<td>&quot;</td>
</tr>
<tr>
<td>GAMES HALL</td>
<td>Latex Cement</td>
<td>Acoustic plaster</td>
<td>Exposed structural roofing</td>
</tr>
<tr>
<td>ASSEMBLY HALL</td>
<td>Rift sawn British Columbian Pine</td>
<td>Exposed brick and plaster</td>
<td>Limpet asbestos applied directly to structural roof</td>
</tr>
<tr>
<td>Category</td>
<td>Flooring</td>
<td>Walling</td>
<td>Ceiling</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Changing Rooms etc.</td>
<td>Thermoplastic tiles with non-slip tiles in shower compartments</td>
<td>Absorbent plaster</td>
<td>Absorbent plaster</td>
</tr>
<tr>
<td>Class Rooms</td>
<td>Hardwood block</td>
<td>Lime plaster laid in three coats</td>
<td>Plaster on suspended metal lathing</td>
</tr>
<tr>
<td>Lecture Theatre</td>
<td>Hardwood block</td>
<td>Exposed brick</td>
<td>&quot;</td>
</tr>
<tr>
<td>Library</td>
<td>Thermoplastic tiles</td>
<td>Finished in acoustic plaster</td>
<td>Acoustic plaster</td>
</tr>
<tr>
<td>General Office</td>
<td>&quot;</td>
<td>&quot;</td>
<td>Plaster on suspended metal lathing</td>
</tr>
<tr>
<td>Staff Rooms</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Entrance Hall</td>
<td>Slate slabs</td>
<td>Exposed brickwork and timber panelling</td>
<td>Suspended acoustic tile</td>
</tr>
<tr>
<td>and Museum Space</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Entrance Hall</td>
<td>Slate floor slabs</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>(Residence)</td>
<td></td>
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</tbody>
</table>
**ESTIMATE OF COST**

**RESIDENCE:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cubic Feet</th>
<th>Cube Price</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student House Units</td>
<td>364,000</td>
<td>5.0</td>
<td>£91,000</td>
</tr>
<tr>
<td>Single Storey Units</td>
<td>91,000</td>
<td>6.0</td>
<td>27,000</td>
</tr>
<tr>
<td>Entrance Halls</td>
<td>17,100</td>
<td>3.6</td>
<td>3,000</td>
</tr>
<tr>
<td>Kitchen</td>
<td>17,400</td>
<td>8.0</td>
<td>7,000</td>
</tr>
<tr>
<td>Dining</td>
<td>45,450</td>
<td>3.6</td>
<td>7,900</td>
</tr>
<tr>
<td>Covered Way</td>
<td>29,000</td>
<td>1.0</td>
<td>1,450</td>
</tr>
<tr>
<td>Link Circulation Way</td>
<td>3,360</td>
<td>1.0</td>
<td>168</td>
</tr>
<tr>
<td>Link Building</td>
<td>5,750</td>
<td>3.3</td>
<td>930</td>
</tr>
<tr>
<td>Heating Plant Room</td>
<td>10,000</td>
<td>6.0</td>
<td>3,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>671,520</strong></td>
<td></td>
<td><strong>£141,478</strong></td>
</tr>
</tbody>
</table>

**Area/Person:** 325 sq. ft.

**Cost/Place:** £940

**Cost/Sq. Ft.:** 60/-

**Percentage Circulation:** 16.4%
**COLLEGIATE BUILDINGS:**

<table>
<thead>
<tr>
<th></th>
<th>CUBIC FEET</th>
<th>CUBE PRICE</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAMES HALL</td>
<td>188,000</td>
<td>3.3</td>
<td>£30,500</td>
</tr>
<tr>
<td>SWIMMING POND</td>
<td>112,000</td>
<td>6.0</td>
<td>33,500</td>
</tr>
<tr>
<td>GYMNASIA</td>
<td>210,000</td>
<td>3.6</td>
<td>37,000</td>
</tr>
<tr>
<td>ASSEMBLY HALL</td>
<td>60,000</td>
<td>3.3</td>
<td>9,700</td>
</tr>
<tr>
<td>ENTRANCE HALL</td>
<td>21,000</td>
<td>3.6</td>
<td>3,700</td>
</tr>
<tr>
<td>CHANGING ROOMS ETC.</td>
<td>95,800</td>
<td>3.0</td>
<td>14,700</td>
</tr>
<tr>
<td>CLASS ROOM/ ADMIN. BLOCK</td>
<td>122,000</td>
<td>4.9</td>
<td>29,000</td>
</tr>
<tr>
<td>GALLERY UNITS</td>
<td>31,950</td>
<td>3.0</td>
<td>4,750</td>
</tr>
<tr>
<td>COVERED WAYS</td>
<td>18,000</td>
<td>1.0</td>
<td>900</td>
</tr>
<tr>
<td>GARAGE UNITS</td>
<td>17,900</td>
<td>3.3</td>
<td>2,900</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>885,450</td>
<td></td>
<td>£164,350</td>
</tr>
</tbody>
</table>

**AREA/STUDENT PLACE**: 335 sq. ft.

**COST/STUDENT PLACE**: £1,170

**COST/SQ. FT.**: 70/-

**PERCENTAGE CIRCULATION**: 14.3%

**TOTAL COST OF PROPOSED BUILDINGS**: £305,800
SOLUTION : ACCOMMODATION FOR 140 STUDENTS, 14 STAFF.

SITE LAYOUT

Functional considerations require that the collegiate buildings should be planned to act as the focus of activities of the training centre. This could best be achieved by placing the buildings at a point most conveniently accessible from all the sports fields. The plan shape of the site, basically similar to a three pointed star, suggested that the college should be sited at the centre of the star form. The residential units were considered to be best sited adjacent to the college units thus
avoiding any duplication of amenities, services etc. and permitting covered access from one group to the other. The position of the existing access avenues, services and the natural landscape reinforced the logic of the solution. The siting at the focus of the site still allowed for good orientation, reasonable shelter and, in the case of the residence, privacy.

PLAYING FIELDS

The site form suggested that the sports areas be broken down into three groups, the planning of the groups being largely governed by the nature of the existing land, natural drainage and the condition of turf areas. It was decided to retain the southern areas of the site as a green belt where lawns already existed and where little extra work would be required to provide lawn tennis courts and a cricket square. It was also felt that the activities on the green belt could form
an attractive feature on the south side of the buildings. The other sports areas required have been placed on the northern and western arms of the site. The general practice pitches have been sited on the north while the first class pitches and athletic amenities have been placed on the west, where easy access from both the centre and from the main roads can be obtained.

BUILDING UNITS

The placing of the buildings at the centre of the site permitted the college to be planned to relate to both the main drive and the service drive without involving the crossing of pedestrian and vehicular circulation. By relating the Residential buildings to the college by means of a central service court servicing problems have been simplified, and the opportunity provided to centralise the heating and pumping plant required, and at the same time allowing for the complete use of communal facilities.
The actual overall plan form evolved, that of two courts buildings connected by a service court, although arrived at by considering the unit relationships in each of the buildings has provided the opportunity of creating a spacial relationship between the small building units and the site, and is wholly in keeping with the contours of the site.

COLLEGIATE UNITS

The grouping of the main elements around the perimeter of the gymastic area has allowed for easy access from any one part of the college to another and provided a satisfactory method of relating the various units with one another. In addition the court plan provides an attractive feature to the various units opening off it. In brief, the various units have been planned with consideration to function, orientation, aspect and service zoning.

The Administrative block, including the class rooms and staff quarters, has been planned to relate to both the main public entrance and the residence,
and situated closely to the Gymnasium wing and the general Assembly Hall.

The School Remedial Hall has been planned to have dual use as a gymnasium and has therefore been placed in the Gymnasia wing. The necessity for direct public access has led to the Remedial Hall being planned in close conjunction with the Main Entrance and the Administrative offices. The planning of changing accommodation between gymnasia has principally been influenced by the necessity to reduce circulation areas and to economise on walling required.

The Assembly Hall was considered to relate not only to the collegiate buildings but also to the Residence and to the dining facilities; this together with noise considerations and the duplicate use of changing facilities led to its plan position.

The Swimming Hall, possibly one of the lesser used facilities, demanded the maximum of sunlight in addition to comparative privacy and shelter from the prevailing winds. It has been sited on the
north west side of the court where it opens up on its southern wall to the courtyard.

The location of the Games Hall, one of the largest units, was determined by the fact that the changing rooms, stores etc. would be required for use with the playing fields and athletic areas.

The south eastern side of the service court has been closed off. The two buildings have been linked by stores and the heating chamber access stairway, providing a covered way relating the Assembly Hall to the dining facilities in the Residence.

RESIDENTIAL UNITS

At the early design stage it was felt that from the point of view of massing the student living quarters should be planned in one or two large units. This was later abandoned on the grounds that it would involve long corridor areas and would not produce the more intimate domestic scale felt desirable for a residence. It was finally decided to plan the living
quarters in a series of small house units opening off a main garden court which would act as the focal point in the scheme.

The Student living quarters have been broken down into house groups of 20 students with 40 students in one unit in the case of the first year students. The individual house units have been planned with three bedroom floors, seven study bedrooms to each floor leaving the ground floor free for the House Common Room and the other communal facilities. It has been attempted in the house units to break the student quarters into small communal groups, both by adopting the house system and by subdividing the house quarters into small groups of bedrooms. The house planning with the open ground floor plan and the small bedroom floors has also been intended to illuminate unnecessary circulation areas. The house units have been sited round the perimeter of the court with a connecting covered walk way, the units being linked by the single storey junior staff quarters with their small informal gardens. The intention has been to
produce a better community feeling with staff members dispersed among the student quarters, allowing for the possibility of a certain amount of staff control and at the same time a degree of privacy. In addition, it was intended that the arrangement should create an intimate atmosphere and provide an interesting spacial relationship between the main court, the student common rooms and the informal staff gardens.

The staff common room and senior staff living quarters have been mainly planned with consideration to orientation, aspect and reasonable privacy and isolation from the students.

The main consideration in the placing of the sick bay has been the necessity for privacy, quietness and orientation.

It is felt that this solution has in general made full use of the opportunities provided by the topography of the site and the variety of views offered by the surrounding countryside, while solving the sociological and architectural problems.
View of Project from South West
View of Project from South
ACKNOWLEDGEMENTS

Ministry of Education, Northern Ireland

Ministry of Finance, Northern Ireland

Geological Survey Office, Northern Ireland

The Principal and Mr. Högberg, Royal Gymnastic Institute, Stockholm

Miss O.M. Pimm, Principal, Ulster College of Physical Education

Miss N. Blunden, Principal, and Miss M. McGregor, Deputy Principal, Dunfermline College of Physical Education

Chief Fire Officer, Northern Ireland Fire Authority

Staff Members, Physiotherapy Department, Edinburgh Royal Infirmary.
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