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ABSTRACT

Aimed at encouraging developing countries to make better use of local sporting traditions and locally available materials, this study reviews existing information on the design of facilities for sport and physical education programs and outlines a handbook that could serve as a guide to the production of those facilities. The assessment of the existing knowledge of the planning and design of sports facilities included, in part, a questionnaire survey of the problems facing constructors of these facilities (sent in 1963 and 1967-68 to correspondents in 43 countries); the technical detailing of several installations of particular interest that represent solutions to the problems outlined; a review of the literature on the subject; the identification, classification, and annotation of relevant documentation; and the compilation of document availability. This publication is meant as a blueprint for future research, publications, and pilot projects in member States in drawing up national guidelines or directives for sports facilities planning and for identifying desirable experimental undertakings. Appendixes contain addresses of organizations where technical information may be obtained and a bibliography. (Photographs may reproduce poorly.) (Author/MLF)

No.8

Sports facilities for schools in developing countries

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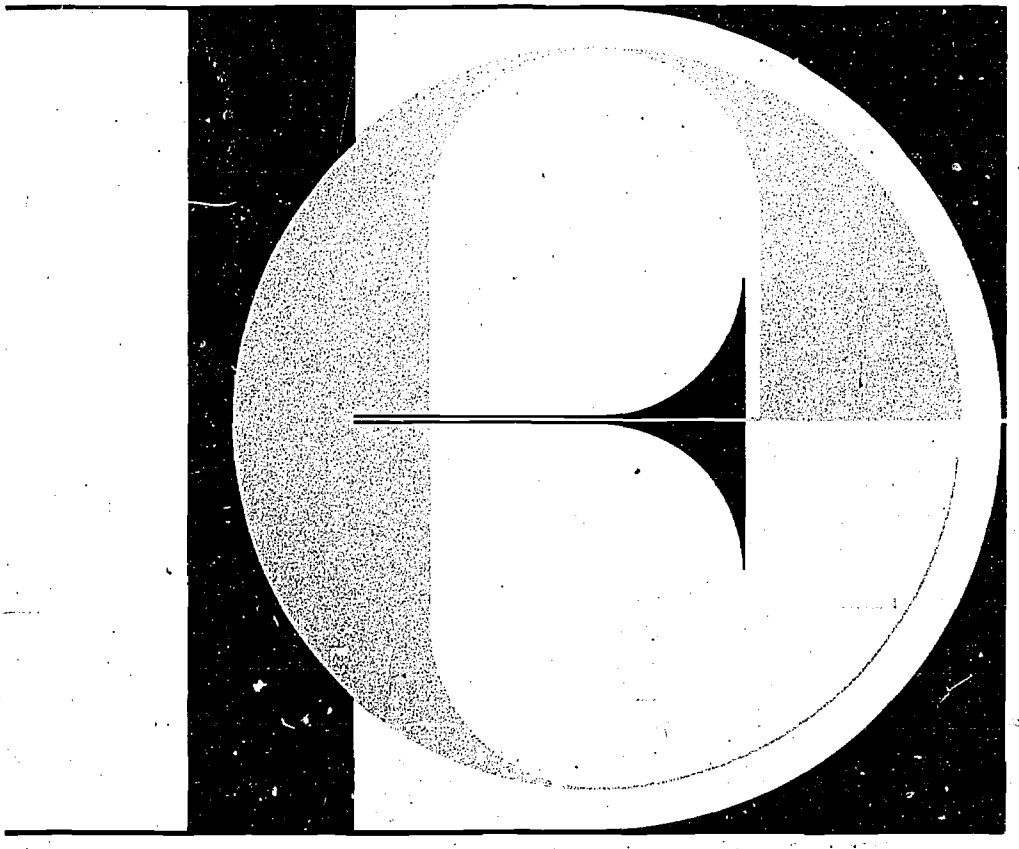
Educational studies and documents



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Sports facilities for schools in developing countries

An inventory of experience and proposals for future projects

by F.B. Scriven

Unesco

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PREFACE

Two of Unesco's operational concerns - with youth activities and with the provision of educational facilities - are reflected in the present study. The Organization, while recognizing the importance of sport in educational systems, also recognizes that the progressive internationalization of sport involves financial problems for the less economically developed countries. Many of the games which have been imported into the tropical regions where so many developing countries are found can only be enjoyed if special facilities are constructed. As a result, a number of sports are accessible to the wealthier sections of the community alone.

The present study is aimed at encouraging developing countries to make better use of local sporting traditions and locally available materials. To this end, it reviews existing information on the design of facilities for sport and physical education (including "sports" not covered by the classical definition of the word e. g. , traditional dances and teaching techniques requiring physical expression) and outlines a handbook which could serve as a guide to the production of those facilities.

It is not intended as a reference work but rather as a review of the present situation - one which is unsatisfactory in many respects - and at the same time as a blueprint for future research, publications and pilot projects.

Unesco believes that it will be of value to a number of Member States in drawing up national guidelines or directives for the planning of sports facilities and for identifying desirable experimental undertakings. It is also hoped that other agencies and non-governmental organizations will follow the recommendations concerning the preparation of a handbook. This would be beyond Unesco's means and could only be successfully carried out if a variety of agencies and organizations participated.

The author of this study, Mr. F. B. Scriven, United Kingdom, is an architect with an intimate knowledge of many developing countries which he visited in his capacity as a Unesco consultant on the programming and planning of low cost educational facilities. While members of the Secretariat provided him with advice and guidance, his paper does not reflect any official position of the Organization.

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SECTION I

TERMS OF REFERENCE

The terms of reference for this study were:

To prepare an assessment of existing knowledge of the planning and design of sports facilities for primary and secondary schools, with particular emphasis on the developing countries. This assessment includes the following:

(a) A reasoned survey of the problems facing constructors of sports facilities for schools in developing countries, based on answers to a questionnaire[1] and on personal experience.

(b) A list of books and documentation available from developed countries that could be useful to developing countries.

(c) A method of classifying and annotating documentation so that useful information may easily be drawn from it, the classification to include short résumés.

(d) A collection of all the documentation listed for the use of libraries of the regional centres and headquarters. A list of addresses where copies of the documentation may be obtained.

(e) Technical details of several installations that are of particular interest and that represent a solution to the problems outlined in paragraph (a).

(f) Recommendations to Unesco on what subsequent steps should be taken toward stimulating pilot projects or a report for wide distribution, or both.

1. Questionnaires were sent only to the Unesco-sponsored regional centres for educational building. Questionnaires, sent by the International Council on Health, Physical Education and Recreation, (ICHPER) in 1963 and 1967-68 to correspondents in 43 countries, formed the principal basis for this assessment.

SECTION II

PROBLEMS

The main problems facing the constructors of physical education and sports facilities for schools in developing countries can be summed up as follows:

Lack of money now and in the foreseeable future to build facilities and buy equipment (see p. 19).

Very few instructors ; facilities should be so designed as to use the few available instructors to the best advantage (see p. 20).

Inadequate appreciation of the objectives of physical education in a developing country. There has been very little study of the relationship between sport and development. It is essential to know what it is hoped to achieve through sport before building facilities (see p. 14).

Inadequate appreciation of the historic and social differences between a developed and a developing country, which indicate that physical education and sport should be given a different form in a developing country. Programmes and facilities tend to be based on inappropriate European models (see p. 21).

Limited view of physical education. It is a continuous process that cannot be put in compartments. Physical education includes movement in all its forms - the walk to school, writing with a pen, play (see p. 16).

Lack of technical information. There is no book or documentation that deals with the construction of physical education facilities in developing countries or in the tropics. The necessary information is either scattered through a number of books and brochures, available in developed countries, or simply does not exist (see p. 22).

Difficult climates. The problem of climate has been exaggerated : it is possible for physical education to take place out f doors in most areas of the tropical developing world (see p. 28). Nevertheless it is true that there are areas of the hot-dry tropics where this is impossible in the middle of the day but even with limited means outside areas can be adapted so that gymnastics can take place continuously (see p. 31).

SECTION III

RECOMMENDATIONS

As a way of overcoming these problems and in the hope of encouraging achievement of the goals set for physical education, the following ideas are proposed:

Preparation of a construction handbook (a framework for this handbook is contained in Section IV).
Establishment of self-help facilities pilot projects and instruction manuals - for playing fields, swimming pools, limited shelter gymnasiums, changing rooms, showers and gymnasium apparatus.
Establishment of an open-air school pilot project to study outdoor facilities - gymnasiums, dance arenas, and patio extensions to classrooms.
Establishment of a mobile swimming instruction unit.
Use of physical education instruction aids, a study of devices that could be used to palliate the lack of physical education teachers. This would include a study of mechanical sports training devices and audio-visual methods of instruction.

These projects need not be separate entities; they could overlap. For example, an open-air gymnasium could be part of a self-help project.

CONSTRUCTION HANDBOOK

The idea implied in articles (b) and (c) of the terms of reference was that the Unesco Educational Facilities Section should distribute existing documentation, together with some sort of user guide or index, to interested authorities.

It was found that existing handbooks on sports ground construction in developed countries suffer from certain faults and omissions which make them only marginally useful to developing countries.

The books concerned are:

"Playing Fields and Hard Surface Areas", and "Secondary School Design - Physical Education", both published by the Department of Education and Science, England and Wales.

"Aménagement Sportifs - 1960", "Etablissement et Entretien des Sols en Plein Air", "Gymnase, Salles de Sport" and "Piscines Couvertes et en Plein Air", all published by the Ministère de la Jeunesse et des Sports, France.

"Shelter for Physical Education", published by the Architectural Research Group, the A and M College of Texas, U. S. A.

"Planning Areas and Facilities for Health, Physical Education and Recreation", published by the American Association for Health, Physical Education and Recreation, U. S. A.

All these books deal with conditions in rich countries in temperate zones; whereas most developing countries are poor and tropical.

The French book "Aménagement Sportif - 1960" contains useful construction details of goal posts, jumping hurdles, basketball rings, etc., in the form of detachable sheets that can be given to local craftsmen to copy - these are items that in a developed country would normally be purchased from a manufacturer's catalogue, but that in a developing country are more conveniently and cheaply made locally. This book is unfortunately out of print; neither the English nor the American book contains details of this sort.

The English books do not mention the landscaping of sports areas. Planting in a tropical area, however, is not only an aesthetic consideration but can be used to control the effects of a difficult climate. The French book "Etablissement et Entretien des Sols en Plein Air" contains an excellent chapter on landscaping, but the plants and trees cited are not suitable for tropical areas.

The dimensional data, giving standard sizes for pitches and apparatus, is unclear in the English books. The data in the French books is much clearer but there are naturally no details for games played only in English-speaking countries - e. g. baseball and cricket.

The American book, "Shelter for Physical Education", now out of print, promotes the idea of the limited-shelter gymnasium, which is certainly relevant to developing countries. The other American book "Planning Areas and Facilities for Health,

Physical Education and Recreation" is generally too specialized to be useful to a developing country.

There is little information for schools in Spanish. CONESCAL bulletin 9 "Escuela y Educación Física" is useful but is not a handbook for constructors.

There is a clear need for a handbook specifically intended for planners and constructors of sports facilities in developing countries. The study in Section IV could be the basis for such a handbook. It would be, first and foremost, a tool for the use of constructors. It would contain all dimensional and technical data necessary to construct facilities adapted to conditions in developing countries.

In addition to its usefulness as a working tool, the handbook could be used to stimulate new thinking and to propagate new ideas on sports facilities. It would state the objectives of physical education. It would point out the differences between physical education in a developed country and in a developing country. It would illustrate new technical solutions, such as limited-shelter gymnasiums, tent structures for sports halls, solar heated showers, sectional swimming pools, etc.

The handbook would necessarily be produced by a team. In addition to the architect, this team should include a physical educationist who has had experience of teaching under tropical conditions and who is capable of putting forward ideas for facilities and at the same time measuring the practicality of the ideas put forward by other members of the team. There should be a landscape architect with a knowledge of tropical vegetation and soils. Other experts, on lighting and filtration, for example, could be employed as consultants when required.

The handbook should be the standard work on sports facilities for schools and no facilities should be constructed without reference to it. A publication may reach a large number of people but by itself can hardly inspire the necessary innovations. Sponsoring projects in different parts of the world would be a more positive way of getting ideas across since administrators who might be wary of innovating would not be afraid of copying a successful pilot project.

SELF-HELP PILOT PROJECT AND INSTRUCTION MANUAL

Facilities for physical education and sports in schools are low on the list of spending priorities in most developing countries. It is difficult to see how this can be changed - if indeed it should be changed. This situation in regard to low-cost housing is similar, although it is an urgent social need. In order to encourage house building, the United Nations Centre for Housing, Building and Planning has supported and sponsored self-help housing projects in Africa, India, South-East Asia and the Philippines, and has published a "Manual of Self-Help Housing". This self-help idea should be extended to the construction of sports facilities. Self-help methods could be used for the construction of playing fields, swimming pools, limited-shelter gymnasiums, changing rooms and showers, and apparatus.

Several schools in various parts of the world have already built facilities using student labour.

The methods used should be labour-intensive. Earth could be moved by the techniques that were used to build the canals in Europe. Large civil engineering works are being undertaken in this way in several developing countries. Strength, team-spirit and leadership are needed in this sort of work as much as in games. It would be a project mainly for secondary school students, although it should be possible to involve the local community. The projects could be linked to lessons on community development, economics and history.

Several pilot projects could be organized, perhaps by the Unesco-sponsored regional centres for educational building, in collaboration with other centres oriented towards the creative development of sport. The centres, whether national or regional, should emphasize indigenous research. Unesco could provide technical information and equipment, and pay for materials. Reports on the project could be written and printed by the students working on the projects, and these reports (incorporating photographs and perhaps a film) could then be circulated to other schools wishing to build self-help facilities.

Open-Air School Project

The project would demonstrate that physical education (or any education) can take place out of doors in most tropical climates as efficiently and agreeably as indoors. It would also demonstrate that there is a solution midway between "the piece of rough ground" generally used for physical education in developing countries and the fully enclosed gymnasium of temperate zones; this is the open air or limited-shelter gymnasium. It is surely more appropriate for physical education to take place in the open air, surrounded by trees and sky, than in the artificial environment of a gymnasium.

Unesco, or some other agency, should sponsor or encourage the construction of three types of space: outdoor and limited-shelter gymnasiums, arenas for dance and drama, patio extensions to classrooms.

OUTDOOR AND LIMITED-SHELTER GYMNASIUMS

An outdoor area with a suitable floor with good drainage that would dry quickly after storms. Shade and perhaps limited protection from rain should be provided. This space would be used mainly for gymnastics; games would not be played;

there would be a separate space for dance.

Since this is a space and not a building, it need not be limited to a rectangular floor area. The actual uninterrupted areas required for gymnastics are quite small, although many activities need length - vaulting, for example. The gymnasium could follow the layout of an army assault course, or be hexagonal, as proposed in a recent Dutch "Bouwcentrum" study(1).

A certain amount of shade can be provided by trees which can also reduce heat by vaporization of moisture from their foliage and reduce dust. If planted judiciously, they need not interfere with physical education activities.

If protection from rain is thought necessary, roofing of a suitable sheet material can be provided.

Climbing apparatus would have to be three-dimensional. Showers and changing rooms should be near at hand.

ARENA FOR DANCE AND DRAMA

Dance is a very important part of physical education programmes in developing countries - both national dances and dramatic and classical dancing, ballet and folk dances from other countries.

The sort of space needed for dance is different to that required for physical education and ideas on open-air spaces for dancing will vary. A good floor is essential. There should certainly be some form of enclosure - hedges, walls or moveable screens. The shape of the area will influence the flow of movement - for example, a circular space may tend to draw the movement in too strongly; a long narrow space may draw it out too linearly; a completely square space may be too static.

The Freinet school at Vence, France, offers a good example of a dance area.

PATIO CLASSROOMS

Photo 6 shows a classroom in an English state primary school. What used to be considered separate and distinct activities such as reading, music, art and physical education, are taking place together. The teacher is nowhere to be seen.

Whatever one may think of this way of learning, the choice does not generally exist in a developing country, because it is too difficult to apply these methods in overcrowded classrooms. It is possible to use them with large class groups but not when these are jammed into small classrooms.

More space can be provided by a patio, an uncovered extension to the classroom. Paved, shaded and equipped, it is ideal for reading circles, painting and crafts as well as for physical education. It must be an extension of the classroom and not part of the school playground, and to avoid disturbance from noise, patios should not be adjacent to each other as shown in the Puerto Rico example (Photo 7 and sketch). There must be some form of enclosure - hedges or fences - and an easy flow between patio and classroom. The patio should cost about one-third as much as equivalent space indoors.

Outdoor spaces have a disadvantage in that they can only be used during good weather but on most occasions, well-designed outdoor spaces are more agreeable than inside spaces under tropical conditions.

Rainfall statistics do not show the time or duration of rainstorms, and are therefore useless as a means of measuring the practicality of outdoor spaces in a given climate. There are many regions where the monthly rainfall is very high, but where outdoor facilities would be feasible. Whole days of gentle rain are rare in the tropics. Rain falls in short sharp showers followed by bright periods, or falls predictably at a given hour or season. Most tropical capitals have outdoor restaurants, night clubs and cinemas. It should be possible to build outdoor facilities in all but the wettest regions.

MOBILE SWIMMING INSTRUCTION UNITS

Swimming instruction is a right and a necessity. Deaths due to drowning among children of school age in developing countries are enormous. There is a great lack of swimming pools and other places to swim. The majority of schools would like to teach swimming, which forms part of the school curriculum, but lack the facilities. Building a fully-equipped, concrete-lined swimming pool is beyond the resources of most schools, even as a self-help project. In Africa there is roughly one school swimming pool per country.

The United States Marine Corps, using the "drownproofing" method of swimming instruction, developed by Professor Fred Lanone of the Georgia Institute of Technology, has shown that recruits can be taught to swim 75 yards and stay afloat for one hour - both in full uniform - after only 15 to 20 hours of instruction. To be effective, this instruction should be reasonably continuous - one hour per day, rather than one hour per week.

In these circumstances, given the shortage of instructors and swimming pools, it would make sense to have a mobile swimming instruction unit for several schools: that is, some form of portable sectional or inflatable swimming pool carried in a van. The van would also carry the water treatment plant and would be accompanied by the required number of swimming instructors. Once the pool had been assembled, the van could be used

1. Stichting Informatiecentrum Voor Scholenbouw, De Accommodaties Voor Het Onderwijs In De Lichamelijke Oefening Bij Het Basisonderwijs, 1969.

as a changing-room. It would stay at each school from two to three weeks or until the majority of children, of a given age group, had been taught to swim well enough to reach shore should they fall from a boat. This would be the most economical way of using limited resources. Further research is needed to find the best type of equipment and portable swimming pool, and the most effective methods of swimming instruction.

PHYSICAL EDUCATION INSTRUCTOR AIDS

There is an enormous shortage of trained physical education instructors. Training for such instructors is low on the list of priorities, although a great deal of time is devoted to physical education, so that it may be said that the teacher shortage is more acute in respect of this subject than in any other. As regards other subjects, the following methods of alleviating the teacher shortage have been tried: audio-visual methods - closed circuit television, film loops, etc. ; teaching machines ; student participation in teaching. These methods could well be applied to the teaching of physical education.

In developed countries there are already a large number of "machines" for teaching swimming, baseball, tennis and golf. Some of these are too expensive for general use in developing countries, but others could be adapted or simplified.

SECTION IV

THE FRAMEWORK FOR A HANDBOOK ON SPORTS FACILITIES FOR SCHOOLS IN DEVELOPING COUNTRIES

A. INTRODUCTION

Sport has been defined as: "any physical activity which has the character of play and which involves a struggle with oneself or with others, or a confrontation with natural elements. "(1)

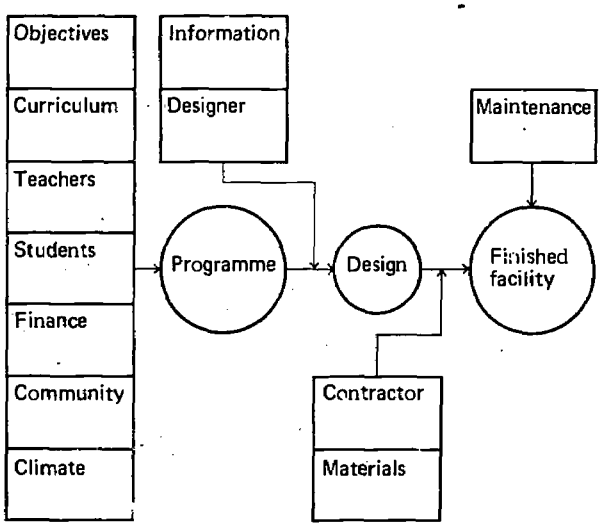
Physical education is the development of the full physical potential of each child. As a formal part of nearly all school curricula, it is not generally considered as play; but there is no clear separation between sport and physical education.

Physical education is part of intellectual education and vice versa. Writing with a pen, for example, in the early years, is as much a physical as an intellectual achievement.

What happens at home or in the community or during other periods of the school day influences the child's behaviour and physical abilities as much as events during the formal physical education periods. It is not possible to consider facilities for sport and physical education in isolation from the other school buildings or from the home and community environment.

It is not only children who need the benefit of sport and physical education. Education - intellectual and physical - should be a life-long process, not limited to the years at school.

The following diagram summarizes the inputs and processes which lead to a finished facility for sport and physical education.



It is impossible to over-emphasize the need to approach this problem through team work. The designers cannot solve well problems which were ill-defined by the potential users and, on the other hand, the users cannot be expected to understand the potentials and limitations of developing a particular facility within a limited budget.

This means that in order to devise a programme of construction - that is, a document defining the number, type and quality of facilities, we need to know the following:

basic objectives of physical education,
number and qualifications of teachers,
number and ages of the children,
composition of the local community,
climate of the region,
amount of money available.

The following groups should be consulted:

teachers,
students,
local community.

The programme is given to a designer or a team of designers - architect, landscape architect, engineer - who use their skills and the available information on materials and methods to make a design.

The design is given to a constructor who uses materials and labour to build the finished facility which then only needs to be maintained.

In a developing country some links in this chain may well be missing or insufficient. There may be little money, few designers and scant information. The proposed brochure would take this into account and put forward some solutions.

1. International Council of Sport and Physical Education, Declaration on Sport (1964 Unesco) p. 9.

B. THE OBJECTIVES OF PHYSICAL EDUCATION AND SPORT IN SCHOOLS

To promote holistic development

It is now commonly understood that physical and intellectual development are linked - development of one encourages the development of the other. The Ministry of Education in France which has traditionally emphasized intellectual development to the near exclusion of physical development, began an experiment in Vanves, near Paris, in 1950. This experiment was conducted in the last year of primary school. Intellectual work was limited to the mornings only, the afternoons were spent on sport and physical exercise. A normally taught class from another school was used to compare results. Not only were health, bodily development and sports performance superior in the experimental class but so was intellectual work.

Experiments in education usually give favourable results - at least in the short run - because teachers and pupils are excited to be part of something new and give their best. Nevertheless, the conclusions of this experiment are generally considered to be valid.

The school day, in the case of the experiment, consisted of intensive intellectual work followed by intensive physical exercise. Modern teaching methods in primary schools and to a lesser degree in secondary schools, tend to blur these sharp edges between physical and intellectual education. Active methods of teaching stress learning by experience and discovery rather than by instruction. "Activity and experience, both physical and mental, are often the best means of gaining knowledge and acquiring facts. "(1)

Freedom of movement during the school day lessens the need for physical education periods, specifically as a release from the strain of sitting still.

Perhaps the harmonious development of the individual - the realization of his full potential - should be the only goal of any education, but in a social context physical education has other objectives and these will influence the type of facilities that are provided. Broadly, if the objective of sport is pleasure, the facilities will have a gay aspect: if the objective is military preparedness, they will have a more austere aspect.

To develop team-spirit, leadership and character

In 1963 and again in 1967, the International Council on Health, Physical Education and Recreation (ICHPER) sent questionnaires to correspondents in 43 countries. One item read: "List four or five objectives or purposes of physical education in your country." The reply of Mr. Enrique Burbano of the Ministry of Education and Sports, Quito, Ecuador, was typical of many:

"To develop not only the muscles and organs, but to stimulate also the development and growth of the individual within an appropriate social atmosphere; to develop the muscular strength, the best bodily activity, the resistance, the flexibility, the agility of the individual and to stimulate the sense of joy and the appreciation of beauty; to cultivate grace and rhythm; to contribute to the realisation of the democratic ideals; to cultivate honesty, control of emotions, gentlemanly behaviour, a sense of kindness, valour, and courage. "(2)

The stated objectives in both developed and developing countries are very similar. The reply from Mr. Peter McIntosh of the Inner London Council College of Physical Education, United Kingdom, was as follows:

"To develop normal physical growth, body control and fitness, personal skills, social accomplishments, and character training and social behaviour. "(3)

Many replies emphasized the idea of training character or forming personality. Clearly great things are expected of sport and physical education in school that are not expected of other subjects.

Since one of the reasons most frequently given for sport in schools is to develop qualities of leadership and responsibility, it seems reasonable to encourage these qualities further by allowing students to run their own sports programmes. As a secondary effect this would release physical education teachers for other duties. The idea of student-control of sports programmes has received the support of the Director-General of Unesco, Mr. René Maheu. Speaking in Paris in May 1969 he said:

"Sports organizations and clubs must become centres for real contact between adults and young people; and adults, abandoning the paternalistic approach which can lead nowhere, must give the young the opportunity not only of expressing their views but also of taking part in the decisions required for the reorganization of sport that is so vitally necessary. It no longer seems natural, as it used to do, to leave young people to play their matches while refusing to give them a say in dealing with the problems of the administration and management of the clubs and federations. In this connexion, what is happening in the universities will probably lead young people sooner or later, even if they have not yet shown clearly that they intend to do so, to demand means of playing an active part in every aspect of sport and its organization. And, for my part, I think they should be helped to do so, for their freshness of approach and lively inventiveness, like the generous sympathies by which they

1. Central Advisory Council for Education, England, Children and Their Primary Schools - Plowden Report (1967 HMSO) p. 195.
2. ICHPER International Questionnaire Report, Part I, 1967-68 revision, Physical Education in the School Curriculum, p. 25
3. ibid. p. 27

are moved, are bound to be of help in restoring the vitality and inspiration of sport."

The potential socializing effects of sport certainly do not arise as a result of mere participation. There is as yet no teaching aid which will do the job of the teacher and, therefore, whatever the material, whatever the content of a lesson or programme, the teacher must plan for pre-established objectives and the programme or lesson must be conducted in such a way as to achieve those objectives. It is also pertinent at this point to know that whilst modern youth is often accused of not joining in community efforts, the reason lies not so much in the changed attitude of young people towards community activities in which youth has for many years played an important role; the present situation is often engendered by the fact that older people are not prepared to give up their time and energy to provide the leadership which is so essential to the successful fulfilment of any project. There can be no followers without leaders.

To produce athletes and teams capable of representing their country

No national correspondants in their replies to the ICHPER questionnaire admitted that one of the aims of the school physical education programme was to produce athletes capable of representing their country although it is difficult to ignore popular pressure to produce winning athletes. Professor J. A. Laoye of Nigeria was more realistic when he said:

"The people of every country would very much like their country to rank high in the field of sports and the name of their country written in the 'World Book of Sports'. Ethiopia has been placed on the bright side of the world map by the efforts of her marathon gold medalist, Abebe Bikila, in the last two Olympic Games. The production of national and international champions in different sporting activities is in fact one of our main objectives because we believe that such champions are ambassadors of the country."(1)

Good international athletes, however, or the effort needed to find and promote them, can divert interest and money away from sport for all.

Success in international competition does not necessarily mean a good general level of fitness. President Kennedy wrote the following in 1960, after comparative tests had shown the lack of physical fitness of adults in the United States:

"Never in history has the United States been represented by a more vigorous group of athletes in national and international competition. Yet we must not allow our pride in these few men to obscure the fact that over the past decades the level of physical fitness of much of our citizenry has been far below any reasonable national standard."

To provide a spectacle

Sportsmen can benefit from seeing performances by the more gifted, but sports are not usually watched for this reason. Spectators are drawn to sport not so much by the spectacle or by the ritual, but because they identify themselves with their representatives.

Most educators are anxious for the entire school to participate in the physical education and sports programme. They do not want the programme to be limited to a gifted few, with the rest acting as spectators. In the United States, where many high school sports programmes are financed by paying spectators from the local community, the role of sport as spectacle has often been over-emphasized:

"Sports facilities become increasingly ostentatious and expensive because of the pressure to accommodate more spectators to support the financial load of the sports programme ... The big loser, of course, is the student. With the tremendous pressure to win prevailing, the student athlete is thrust into the position of 'producing' or answering to a fickle public for his failure. In most cases, the average student is neither mentally nor emotionally prepared for such a role ... in the end, the student either fails to make the grade or becomes a highly specialised performer."(2)

To provide harmless outlets for aggression and socially harmful impulses

This reason for practising sport was not mentioned by any of the ICHPER correspondants, although clearly many games can be a substitute for agressive and socially harmful impulses, not only in players but also in spectators.

The playing of sports in the early Victorian public schools in England was seen more as an outlet for youthful high spirits, than for training of character; this idea came later. Games like rugby football were seen as a controlled, and controllable, riot which prevented the real thing.

To bring the élite together with the people in the pursuit of a common interest

Few commentators mention the value of sport as a means of bridging the gap between the educated élite and the mass of the people. Because of the small amount of money available in most developing countries, it has not been possible to educate more than an élite whose separateness has been reinforced in Africa and other places where the language of education is not that of the people. Interaction between school and community could be encouraged through sport. In many African and South American countries football is extremely

1. Eighth International Congress (Addis Ababa, Ethiopia) 27-31 July 1965. ICHPER, Washington DC, 1965. p. 53
2. The Architectural Research Group, Shelter for Physical Education (1961 The A & M College, Texas) p. 13.

popular and can be considered the basis for a common culture - a link between the educated and the uneducated, between different ethnic groups, a common language and mode of communication.

The "Outward-Bound" schools of mountaineering and seacraft that exist in the United Kingdom, Kenya, Malaysia and Nigeria have the bridging of class and education gaps as an objective.

To provide a healthy and relaxing leisure occupation to be continued in adult life to ensure fitness

In the developed nations, owing to a general decline in physical fitness, importance is now given to learning sports that can be played in adult life. The American Association for Health, Physical Education and Recreation has started "The Lifetime Sports Education Project" in the United States to promote this goal. Priority has been given to instruction in small-team games - tennis, golf, etc. - which are easier to organize and where facilities and clubs already exist outside the schools. It was found that, on average, men stopped playing football at 24 but played golf into old age. Therefore, to promote fitness in adults, golf should be taught in school. In developing countries the conditions are different:

the general level of fitness, in the adult population, is much higher;

it is easier to organize large-team games, because the structure of society is different;

there are few clubs for small-team games. Emphasis on this type of activity, however, should not lead to any decrease in the efforts that go into other sports. Football, for instance, is desirable for young people who not only have the capacity but even a need to express themselves through highly active sports.

To develop agility and skills useful in national defence

The connexion between physical education in schools and military preparedness is nearly at an end, although physical education was introduced into schools by the drill sergeant in many countries. Only the correspondent from Bolivia, answering the ICHPER questionnaire, mentions that one of the objectives of physical education, in his country, is "to prepare the individual to defend his country."(1)

To further the emancipation of women

This reason is rarely given as an objective of physical education and sports in a developing country, although in Europe sport played an important part in female emancipation. It was difficult, or impossible, to play certain games in tight corsets and long skirts; wearing modern clothes, as practical as men's clothing, was an important step forward, enabling women to compete on more equal terms with men in factories and offices.

The part that sport could play in women's emancipation in Libya was noted by Mr. D. W. J. Anthony:

"It is now recognized that backwardness in the life of women can cause major social problems - one being the inability of secluded women to deal with the intricate and demanding problems of modern daily life. Libyan woman is thus finding her rightful place in modern society; in women, Libya will perhaps find her best doctors, writers and artists. In this movement towards emancipation, sport can play a powerful part as it has done in the women's 'freedom' movement elsewhere."(2)

Even in Nigeria, where the problem of the secluded woman does not exist, the inequality of women in relation to sport has been noted:

"Nigerian women because of their extreme involvement in home affairs, have been unable to equal the men in the enjoyment of sports for recreation. Public tennis courts are used by men predominantly and seldom by women; polygamy still exists in the country and therefore, the idea of a unitary family hardly exists. However, occasionally one sees a few Nigerian families spending a day out at the sea-front recreational beaches. Women have not found their place beside their men-folk, so family recreation is a dream for future realisation."(3)

C. SCOPE

Physical education is something more than merely those activities that take place in the thirty minutes set aside each day in most schools for the subject. Physical education is a continuous process, the many aspects of which include:

The walk to school

"Then the whining school-boy, with his satchel and shining morning face, creeping like snail unwillingly to school."

The walk to school which is the usual, although sometimes unwelcome, prelude to each school day in most of the world, has largely been eliminated in the United States by the school bus. Lewis Mumford writes in "The City in History":

"We are faced with a curious paradox: the new suburban form has now produced an anti-urban pattern. With the destruction of walking as a normal means of circulation: the motor car has made it unsafe and the extension of the suburb has made it impossible."

1. ICHPER, op. cit. p. 11
2. D. J. W. Anthony, Libya - Sports Affairs, October 1969, Unesco, Paris. p. 7.
3. C. Lynn Vendian and John E. Nixon ed. The World Today in Health, Physical Education and Recreation, article by Asikiye Kiri, p. 285.

The desirable distance between home and school is the subject of regulations in many countries:

Nursery schools: 1/5 of a mile or 300 metres (the regulation distance is the same in England, the Netherlands, Switzerland and the United States).
Primary schools: 1/2 to 3/4 of a mile (800 to 1,200 metres) in England, 1/2 a mile (800 metres) in the United States, 1/3 of a mile (500 metres) in the Netherlands, 1/3 to 1/2 a mile (600 to 800 metres) in Switzerland.
Secondary schools: 3/4 of a mile (1,200 metres) in England, 1/2 to 1 mile (800 to 1,600 metres) in the United States, 1/2 mile (800 metres) in the Netherlands, 1/2 to 5/8 of a mile (800 to 1,000 metres) in Switzerland.

The walk to school in many developing countries is far longer - as much as three miles in Africa. This may not be a disadvantage; the basic cause of the decline of physical fitness in the West is the decrease in casual exercise. The task of the urban planners is to make the walk to school agreeable and safe.

The criteria for adults have not been clearly established but, in view of their work commitments, it is evident that a 1,600-metre walk to participate in a sports activity would be discouraging to all but the most motivated. Walking distances suitable for adults need to be suggested.

Movement and physical activity in relation to the teaching of other subjects

The rigid curriculum, divided into twenty- to thirty-minute subject periods, is giving way to flexible time-tables or to no time-tables at all - to a curriculum organized around centres of interest or projects that cut across many subjects.

The typical primary classroom scene of thirty years ago was a room with high-level windows and forty children sitting, either singly or in pairs, at neat rows of desks in front of a teacher with a blackboard - immovable seats in orderly rows fix the sphere of activity of each child.

The situation today, at least in most developed countries, is much freer - children in groups of different sizes work together at tables or on the floor, perhaps even at different subjects (see photo 6). There is movement between the groups; there is more space and light. The teacher is there more as an advisor than as instructor.

Movement and games are being used to teach a large range of subjects. The following is taken from a United States Office of Education publication - "Physical Education in Urban Elementary Schools." United States Department of Health, Education and Welfare, Washington, D. C., 1959.

"Arithmetic - measuring distance and time
Reading - interpreting descriptions of activities and rules; understanding the meaning of achievement tests and scores
Music - creating melody and words as a basis for movement
Geography - folk dances
History - dances of various periods
English - dance composition based on poems and stories."

The following is an account of an improvised lesson on "areas" in a British primary school:

"At one school in Bristol, children noticed that the wooden floor of the assembly hall consisted of squares about a foot on a side, and on a teacher's suggestion, with the help of some 50-foot lengths of rope, they worked out a game. Following the squares on the floor, pairs of children made polygons with their rope; some were simply large rectangles, most were intricate, with many sides. Then each child would find the area of the polygon by counting (hopping from square to square) the number of squares inside the perimeter."(1)

If the primary schools in the developing countries have not moved in this direction, it is because these methods need smaller class sizes and more space, both of which cost money. But the need is felt; Mr. S. G. Ayi-Bonte, speaking of physical education in Ghana at the Eighth ICHPER International Congress at Addis Ababa in 1965, said:

"Our most urgent task as educators and as physical educators is to effect the liberation of the child. This is being done by making the school environment as stimulating as possible so that the child can live and learn in it and explore and experiment and so arrive at new ways of doing things."

Recreation periods

Thanks to such educational theorists as Jean Piaget, the importance of children's play in the learning process is now generally recognized. This is play in the sense of "messing about" rather than the structured play that would take place during the physical education period. In the more enlightened primary schools, the distinction between physical education and play has become blurred - "the distinction between work and play is false, possibly throughout life and certainly in the primary school."(2)

It is not simply play that children need in recreation periods, but freedom. Play is what they do with their freedom. If a playground is over-designed - too structured - obviously built for play and too stiff with adult expectations, it will have failed.

A playground for children of primary school age can be very simple. It should have provision for climbing, sand, grass and hard surfaces, perhaps some water and shade.

1. Joseph Featherstone, "How Children Learn", The New Republic, 2 September, 1967. p. 10.
2. Central Advisory Council for Education op. cit. p. 193

Children of primary school age can be induced to play organized team games, but it is not their natural inclination. Playgrounds will usually be designed for free play and the recommended size for primary schools in developed countries is usually about 35 sq. ft. (3.25 m2) per pupil. Secondary school playgrounds need be no larger when hard surface playing fields are provided.

Classes conducted in the open-air

Many more classes could be conducted in outside areas, away from constricting dusty classrooms, especially in tropical countries. A class in India being taught under a tree, in dappled sunlight, seems so attractive that one wonders why it is not seen more often. The construction of a patio area adjacent to every classroom could be extremely useful in primary and secondary schools.

The size of primary school classrooms was based on the area needed to house forty children at desks screwed to the classroom floor. The areas provided in new classrooms in many countries are not much larger. More space is needed to enable teachers to introduce more active methods of teaching, and to allow children to work in small groups.

In secondary school, more space is needed to house groups working in ways other than the traditional forty-to-a-class pattern - for individual work, for small and large groups or for seminars. In tropical countries, these spaces are not usually provided because of lack of money. In many areas they can be adequately provided outdoors, but they must be rigorously designed to have all the advantages of rooms and more.

What is needed in primary school is an uncovered extension to the classroom. Paved, shaded and equipped, isolated visually and acoustically, it would be ideal for reading circles, painting, crafts and physical education. It must be an extension of the classroom, not part of the playground, and must have some form of enclosure in the form of hedges or fences. It must be possible to have an easy flow between the patio and the classroom. The patio should be equipped with benches because of the inconvenience of moving furniture out from the classroom; these benches can be of a very rudimentary nature. A patio should cost about one-third as much as equivalent space indoors.

Activity and movement can be effectively integrated into the curriculum by using the environment and

"Through the boundless curiosity which children have for the world about them ... Whereas once the teacher brought autumn leaves into the classroom and talked about the seasons and their characteristics, now he will take the children out to see for themselves. Rural schools can be overwhelmed by the variety of material on their doorsteps. Crops and pastures, wild flowers and weeds, farm animals, wild creatures of every kind, roads and footpaths, verges, hedges, ditches, streams, woods, the weather, the seasons, the stars, all provide starting points for curiosity, discussion, observation, recording and enquiry ... Teachers in town schools can make use of railways and other transport systems, and the local shops and factories, all of which can provide suitable material. Building sites are almost ubiquitous and can provide an approach to geography, mathematics and science. "(1)

Resource areas can also be laid out on school land. The following list is taken from "Planning Areas and Facilities for Health Physical Education and Recreation":

Outdoor biology laboratory: To study pond life, plants and trees, grafting and genetics.

School garden: A place for growing vegetables and for the propagation of plants, some of which may be used for area improvement.

Wildlife sanctuary: For the study of birds: it will contain birdhouses, feeders and bird baths to attract a variety of birds.

Weather station: For the study of meteorology: it should be located in an area that can be fenced off and locked.

Week-end or holiday activities, such as camping, scouting and "Outward Bound" schools

These activities are an increasingly important part of physical education. Week-ends and holidays are useful because they mean that resources far from the school can be used; these might include the sea, the mountains or a nature reserve.

Schools can be used as bases for expeditions. For example, classrooms in schools at the seaside can be used as dormitories to accommodate children from inland who might otherwise never know the sea.

D. CURRICULUM

The content of physical education and sports programmes

The antecedents of sports and physical education in Europe are similar. People, not of European descent, in the developing countries are sometimes made uneasy by this. There have been attempts, mainly in Africa, to decolonize sport. The following suggestions were made at a meeting of experts discussing the "Adaptation of the General Secondary School Curriculum in Africa" at Tananarive, Madagascar, in July 1962:

"Gymnastics as practised in European educational systems was by no means an absolute and intangible ideal ... physical education could very well incorporate movements borrowed from local and traditional choreography. The meeting also

1. ibid. p. 199

recommended the encouragement of certain traditional games of skill which would help to preserve the individual personality of Africa, e. g. spear-throwing, shooting with bow and arrow, etc. "

It is in the field of dance that the traditionalists have had the most success. Traditional dances are being taught as part of the physical education programme in teachers' training colleges in almost all the developing countries. Developing countries have much to offer the rest of the world in this sphere.

Counteracting and frustrating the move to return to traditional games is the strong urge to compete and win championships in international games. European games are now a very firm part of the local culture in most developing countries. The most usual activities taught as part of the physical education and sports programmes in developing countries are gymnastics, athletics, dance, soccer, volleyball and basketball.

There is a feeling among some educators in Africa that physical education is an unnecessary European import; that sports and games are a waste of energy when physical energy is urgently needed for "Nation Building". They are concerned that the high investment in rural primary schools has not brought about any real change in rural communities, especially in relation to agriculture. They advocate linking the curriculum to rural life - giving an important place to agricultural theory and combining this with practical periods of agricultural work. Mr. Albert Tevoedjre of Dahomey writes:

"The school must be able to impress on children in a practical way the elements of plant, animal and human life which will enable them to understand technical changes in agriculture ... Therefore schools should possess fields. "(1)

However, this type of school is rare in Africa. What should the physical education curriculum consist of in such a school? Its content should certainly be more cultural and aesthetic than utilitarian. The emphasis would be more on self-expression through movement than on strengthening the body.

Suggestions should be sought on ways of adapting various games to conditions in developing countries. Mini-basket offers an example while a combination of ice hockey and field hockey might offer possibilities.

The question of providing a balanced health programme for the children should be considered when devising curricula, taking into account nutrition (school meals), rest periods and physical activity.

Time spent on physical education and sports

There is very little difference between nations as regards the time allotted to formal periods of physical education. The national average in the United States is now two hours per week. Canada, France and Ghana all have similar requirements. Around two hours a week is the international average.

The time required for physical education in secondary schools is similar. But here there are important differences. At the secondary school level physical education is usually taught by a specialist teacher; in developing countries they are very few. If schools do not have specialists, physical education tends to be neglected.

"It is the Cinderella of all subjects; physical education can be put in anywhere or left out anytime. "(2)

For the Cinderella of all subjects, physical education is allotted a great deal of time. The following quotation describes conditions in the United States, but as we have seen, the developing nations do not lag far behind and are anxious to catch up.

"At the elementary school level, the national average is almost two hours per week for each student. This time is in addition to free play periods. This is almost the same amount of time the children spend with arithmetic, spelling and reading, and exceeds the total time spent on such subjects as geography, history and science.

The programme at the junior high school level is more extensive and ranges from two to five hours per week. At the high school level, many school districts officially schedule five hours per week for each student. This time generally includes the regular physical education programme, special classes in health education, and some intramural sports. This amounts to about one-sixth of the student's total time where physical education is offered on a four-year basis. By way of comparison, the sciences, presently one of our "hot subjects", consume about one-eighth of the student's time. (3)

E. EXISTING CONDITIONS

Lack of money

In physical education and sport in school, the main differences between the developed and developing countries can be traced to lack of money. The per capita income of the average developed country is still about ten times higher than that of a developing country. Although most developing countries devote a higher proportion of their national incomes to education, there is still a large difference in terms of investment.

The provision of facilities for physical education and sport is low on the list of priorities and is sometimes not considered at all:

"So great and rapid is the expansion of the educational system that there is simply no money for such things as gymnasiums and swimming pools ...

1. La Formation des Cadres Africains, Editions Dilotremer.
2. Report on the Eighth International Congress ICHPER, Washington, D. C., 1965, p. 62.
3. The Architectural Research Group, op. cit. p. 6

It may even be a blessing for we must devise our own system of physical education for these changing times. "(1)

It has been estimated that 15 per cent of every dollar spent on schools in the U. S. A. is spent on facilities for physical education and sport. Spending in the developing countries is way behind this figure; it would be surprising if many of them spent more than 1 per cent.

Officials at the United States Agency for International Development (USAID) were unable to recall a single case where they had financed a school gymnasium or swimming pool. They stated that it was not their policy to finance gymnasiums unless they doubled as cafeterias or auditoriums. Officials at the International Bank for Reconstruction and Development (IBRD) repeated the same story.

In the future, some governments might finance facilities for sports in school as a means of encouraging the production of athletes capable of winning international awards and Olympic gold medals.

Other sources might also be tapped: the Ndola lottery recently financed the building of a school swimming pool in Zambia. It would likewise be possible to obtain funds from football pools, commercial sponsorship and the tying-in of sport with tourism. In general, however, it seems unlikely that more money will become available from either international or local sources.

As mentioned above, there is no causal relation between fitness and money spent on physical education programmes. The way to increase fitness in most developing countries is through increased health facilities, better diet and hygiene. Mr. Akililu Habte, Vice-President of Haile Selassie University, Ethiopia, speaking at the Eighth ICHPER Congress in Addis Ababa, said:

"No amount of physical exercise or sports or athletics is going to help the African child to be physically fit if he is undernourished or malnourished. "

The inescapable fact is that money spent on elaborate facilities for physical education and sport in developing countries at the present time is not a very profitable use of national resources.

Size and composition of classes

There is not the same clamour in developed countries to reduce class size in connexion with physical education as there is in connexion with other subjects. The physical education committee, working on "The Study of Educational Facilities" in Toronto, Canada, thought that thirty to thirty-five children for one teacher was satisfactory. Class sizes in developing countries are generally larger. In Indian primary schools they vary from about thirty-five to forty-five children.

There are often large age differences within classes in developing countries; this makes the organization of physical education periods difficult. Bernard Girod de l'Ain, writing in "Le Monde", noted:

"In many countries, notably in sub-Sahara Africa the maximum age criteria for a given class is not respected. Children of nine years old and children of sixteen years old are frequently seen in the same primary school classroom. "(2)

Community use of facilities

In a developed country, community use of facilities refers to use by adults no longer of school age. In most developing countries, where not all children go to primary school and even fewer go to secondary school, the community is far larger; it includes children and adolescents who have not found a place in school. Usually physical education and sports facilities are concentrated in the schools and are not available to other children.

Mr. Alfredo Colombo of the Brazilian Ministry of Education, speaking at the Sixth ICHPER Congress in Rio de Janiero in 1963, drew attention to the situation in Brazil:

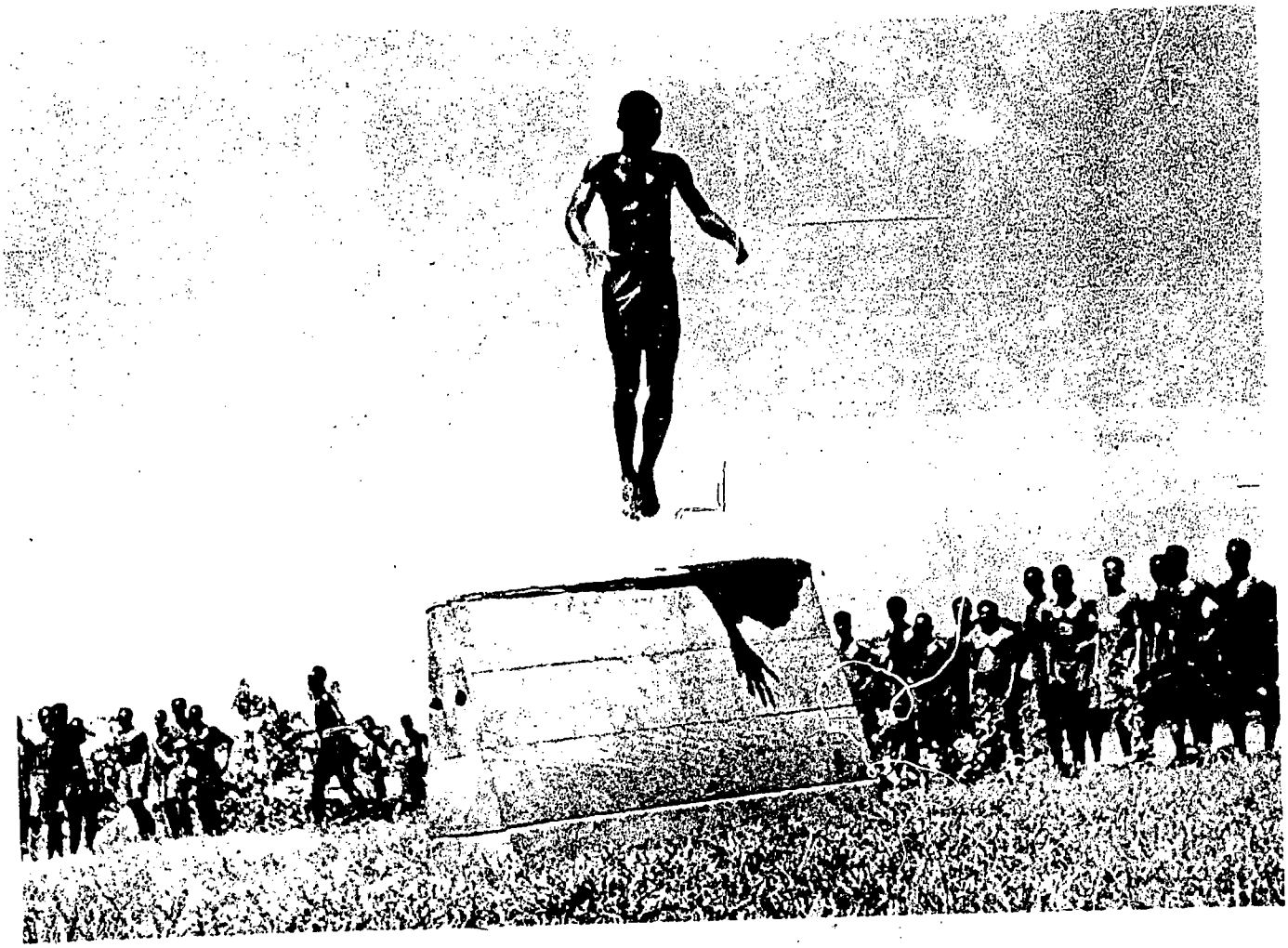
"The truth is that only a small number of the children and particularly of the adolescents are attending school, and compulsory physical education is administered only in educational institutions, and even there without sufficient intensity. Consequently, the underprivileged classes, who need it badly, have no access to physical education and it benefits only the small group of students ... What is necessary, what is urgent, is for us to extend our programmes, as far as possible, to the people, so that the salutary effects of education, including physical education, should not continue to be the privilege of a minority. "

In general there seems to be little use of school facilities by the adult community in developing countries, either out of school hours or during vacations. This is a situation which should be changed. By planning fields and shower facilities, so that they are accessible to both the school and the community, designers can at least ensure that school-community collaboration becomes a possibility. It is also essential to consider providing physical education spaces which can serve such non-sports community activities as meetings, dances, etc.

Lack of teachers and facilities

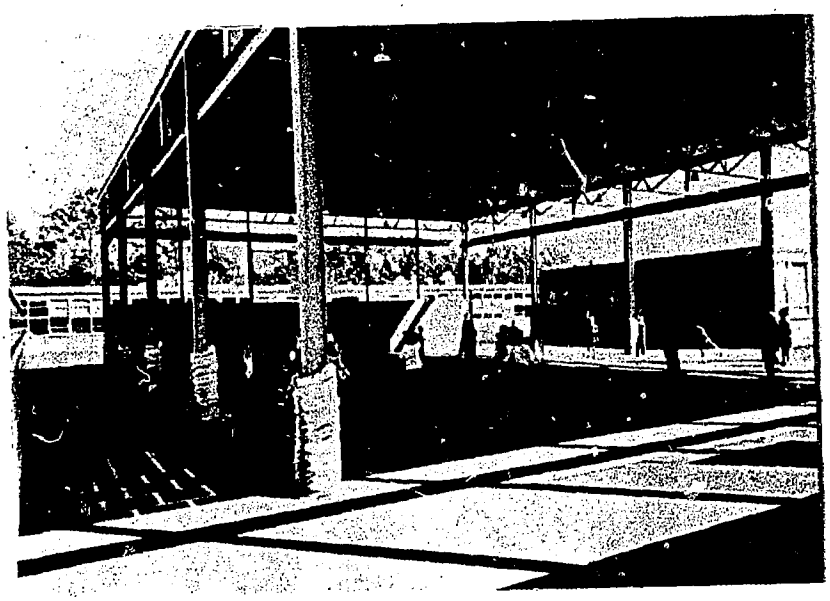
"A stadium without a teacher is dead" (Carl Diem). Sports programmes rely heavily on leadership from physical education teachers, yet in most developing countries, trained cadres do not exist. The lack of facilities and lack of teachers must be considered together, because the question arises: is it worth building the facilities if there are not

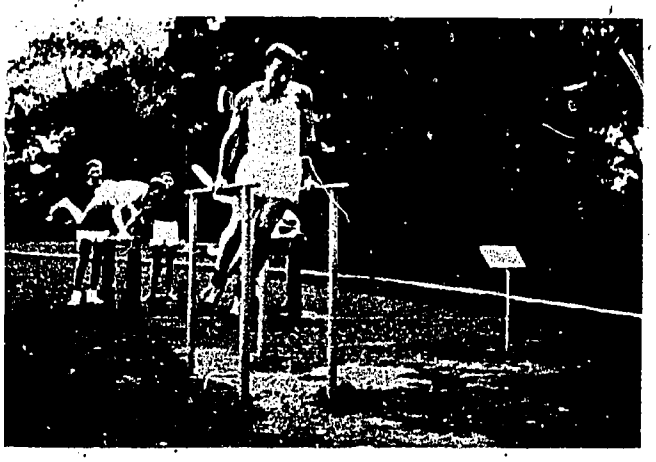
1. Eighth International Congress, op. cit. p. 62.
2. Bernard Girod de l'Ain - L'Ecole dans le Tiers Monde, Le Monde, 29 November, 1966.



1. Gymnastics in open-air in Africa

2. Limited-shelter gymnasium in Princeton, N.J., U.S.A.
   Architects: Kelly and Gruzen

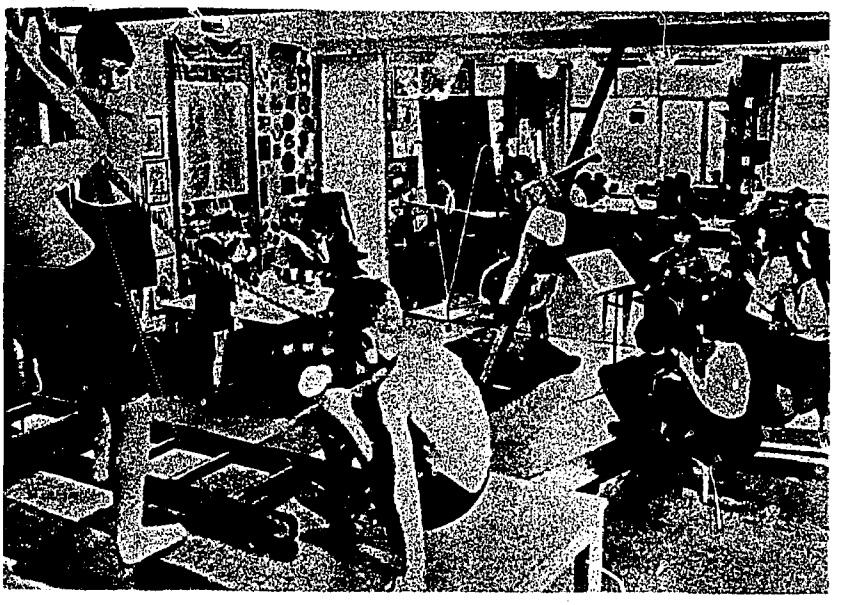


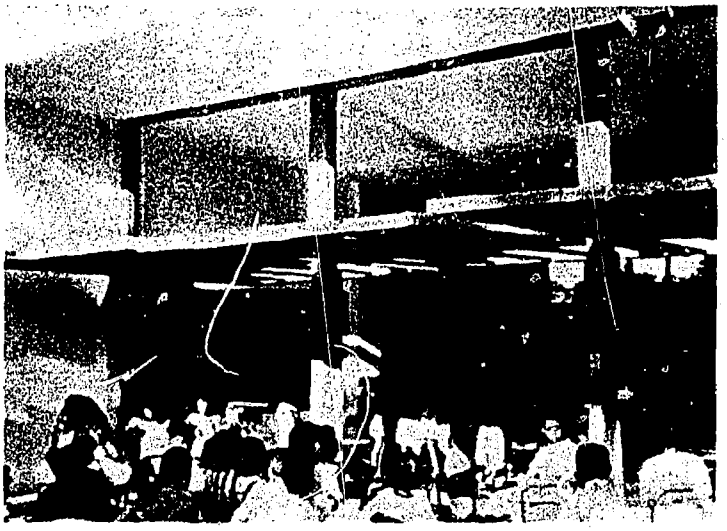


3 and 4 " Assault course " gymnasium in Duisburg, West Germany

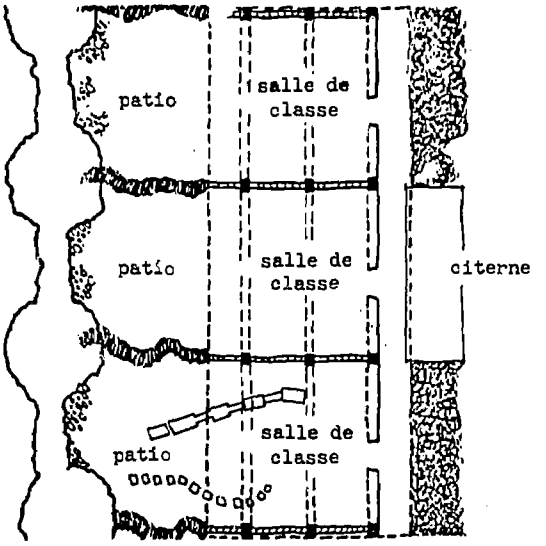
5. Mime at the Ecole Freinet, Vence

6. Classroom scence in an English state primary school





7. Patio estension to a primary schoc' Ln Puerto Rico
architect: Richard Neutra

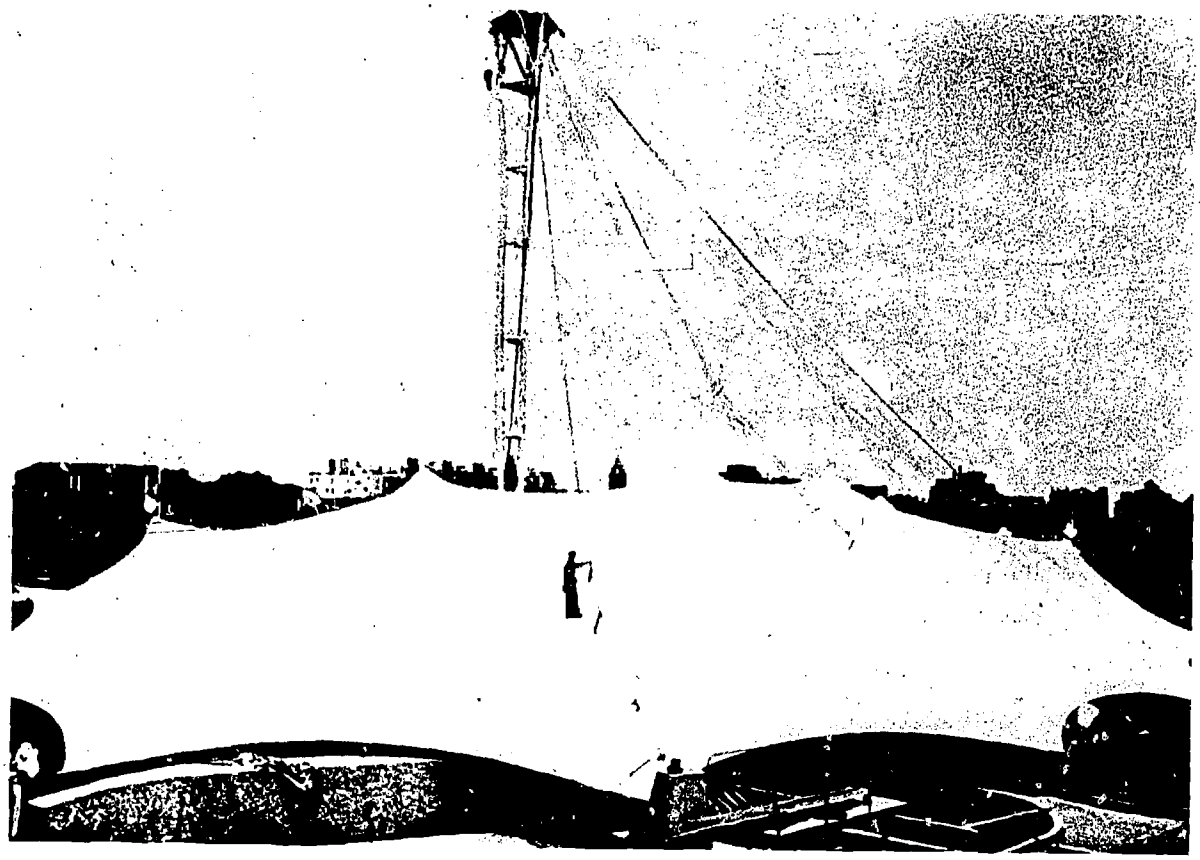


Patio extension to a primary school in Puerto Rico

architect: Richard Neutra

8. A lesson on vectors in the playground of a school in Leicestershire, England

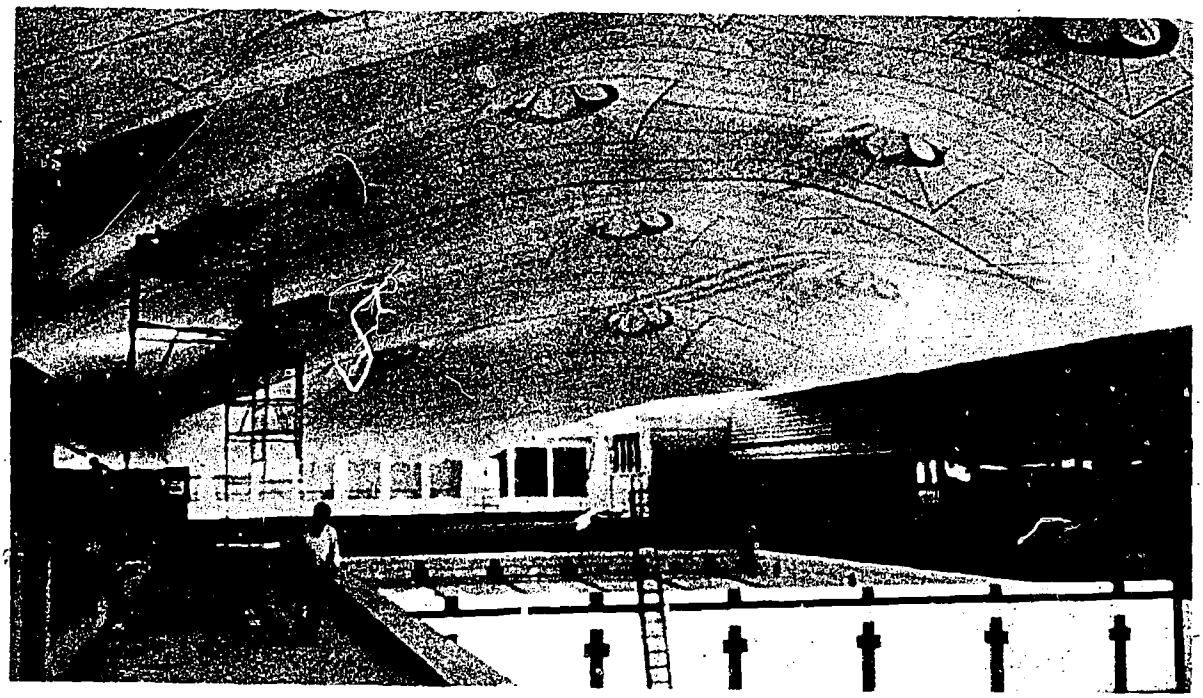
9. An auditorium combined with a swimming pool at Orléansville, Algeria
architects: Louis Miguel and Roland Simounet



10. exterior

A swimming pool on the bld. Carnot, Paris, roofed with a tent

11. interior



enough teachers or, alternatively, is it worth increasing the number of teachers if there are no facilities?

The ICHPER surveys of 1963 and 1967-68, asked "What are the three or four major problems to be overcome in physical education if the programmes are to be improved?" Those most frequently mentioned were the lack of facilities - gymnasiums, sports fields, playgrounds, swimming pools - and the lack of qualified teachers.

Mr. A. E. Arro of the Zambian Ministry of Education, in a paper read at the Eighth ICHPER Congress in Addis Ababa in 1965, maintained that European trained physical education instructors using European methods were not necessarily the best for his country.

"Will the standard of physical education be raised by sending teachers overseas for training? Obviously special training is necessary, but overseas physical education is designed chiefly for teaching under English conditions in English schools or for teaching under American conditions in American schools. The time devoted to improvisation and pioneering work in the average college in England is negligible. Only students who have a flair for improvisation and a liking for pioneer work would be able to settle down under African conditions. Students who spend two or more years at one of the recognized colleges devote the major part of their training to apparatus work and to indoor work. Apparatus work consists of such things as wall bars, beams, vaulting boxes and horses, trampolines, ropes, bucks, aerowheels, agility mattresses, spring boards, etc.

Most if not all of these things would never be used or even seen during a lifetime of teaching under East African conditions. The time and money spent on acquiring knowledge of gymnasiums and gymnastic apparatus would be saved or put to some more practical use in special physical education training for tropical and semi-tropical conditions. Not all graduates of the overseas training colleges, when confronted with a bare piece of rough ground instead of a fully equipped gymnasium, can adapt themselves to these conditions."

Mr. Arro went on to say that there was a need to train teachers and to develop a system of physical education better adapted to African conditions.

There is a real need for instruction swimming pools. The number of deaths by drowning, among children, in many developing countries is frighteningly high. Swimming instruction in rivers and streams is dangerous, because of pollution and water-borne diseases.

Another question in the ICHPER survey was "Are boys and girls required to change into physical education costumes for physical education classes?"

The overwhelming answer was "yes". Changing rooms and showers are a need about which there should be no disagreement. It has also been suggested that, because of trained teachers of physical education, the developing countries might attempt to set up "flying squads" of specialist teachers who could undertake the in-service education of classroom teachers in the subject. This method was used effectively some 30 years ago in Victoria, Australia.

The multi-purpose room

Spaces larger than classroom size are needed in schools for activities such as eating, assembly, and physical education.

Multi-purpose rooms have been widely adopted as a solution in both primary and secondary schools. The activities that take place in the multi-purpose room could include: meals, school assemblies, religious services, film shows, concerts, band practice, dance and gymnastics. Aid sources and local authorities will usually refuse to finance the building of any large space that is not multi-purpose. Obviously the multi-purpose room is designed to avoid building several large rooms that would remain vacant for a large part of the school day.

Recently, the multi-purpose room has been the subject of a good deal of criticism in the developed countries; it has even been called the "multi-useless room". These are examples of criticism from various sources. (1)

From the United Kingdom:

"The multi-purpose hall of today's primary school suffers all the disadvantages of its many uses. To the casual visitor it may appear more like a warehouse than an important part of a school. (2)

"For dance, the size, proportions and character of the conventional gymnasium are not really appropriate. It is too large, too high and too clinical in character." (3)

From Canada:

"The physical education programme should be able to flow smoothly, without interruptions caused by activities such as assemblies, rehearsals and decoration that are part and parcel of normal auditorium use. In other words the gymnasium should not contain a stage (as in the "gymnatorium" concept) or any other equipment that would lend an auditorium flavour to the enclosed physical education complex." (4)

1. School Planning Laboratory, Profile of a Significant School, E. F. L. 1964, p. 12.
2. Peter Manning, The Primary School, an Environment for Education, The Pilkington Research Unit, p. 76.
3. Department of Education and Science, Secondary School Design, Physical Education, H. M. S. O., p. 3.
4. The Metropolitan Toronto School Board, Study of Educational Facilities Report E. 2, 1968, Ryerson Press. p. 199.

"Physical education and music education have unique environmental requirements which necessarily conflict. "(1)

From the United States, Dr. Cyril Sargent of the University of the City of New York, says of the auditorium-gymnasium-cafeterias in New York City's primary schools:

"These large spaces are unnecessary, meals should be served in classrooms, primary schools do not need auditoriums, physical education activities should take place in the yard, the classrooms should be enlarged. "

The multi-purpose room is far too large an area for dining, especially in primary schools; smaller rooms, more domestic in scale are desirable. Its use as an auditorium is limited because its dining and gymnasium functions make a sloping floor impossible. It is impossible to seat more than about 200 people in an auditorium with a flat floor and ensure that the ones at the rear can watch a play or film with any degree of comfort. If a secondary school is to be provided with all the specialized rooms and equipment (laboratories, library, workshops, etc.) that are now needed, and be economically viable, it must have an enrolment of about 500 students.

If the school plans to involve the local community in events taking place in the auditorium, it would be desirable to be able to seat about 700 people. An auditorium of this size, with a raked floor, that can be used as a cafeteria, for physical education and for classroom instruction, has been built in several schools in the United States. But the large spans and operable partitions that are required are extremely expensive.

We should be extremely wary of exporting multi-purpose rooms to developing countries. A careful analysis of the activities that take place in a multi-purpose room in a developing country would show that many of them could equally well take place either in the open or under a limited shelter.

There are several possibilities as regards the design of an outdoor auditorium. It can be terraced in stone like a Greek theatre (see Photo 9) or it can consist of a gently sloping stretch of turf; in either case it needs careful landscaping and drainage.

There should be a stage, with stage lighting and a public address system.

F. THE CONSTRUCTION OF FACILITIES

Facilities development committee

Before starting work on a project, a facilities development committee should be set up to work out details and means of implementation. In his book "The Design of Outdoor Physical Education Facilities for College and School", J. B. Delameter suggested that a facilities development committee should consist of an administrative head (of the school), a programme specialist, an educational consultant, a representative from the local education authority, an architect, a landscape architect, an illuminating engineer, a maintenance specialist, and a student user.

Some of these specialists may be difficult to find in developing countries; but the point is that the planning of facilities is a group activity that should not be entrusted to a single person.

School site size and selection

The choice of a site is one of the first problems which planners and school authorities must consider. Problems of location in relation to the potential users must be examined along with qualitative questions of drainage, suitability for planting, bearing capacity, special installations, etc. School site size is determined by the type of school, the enrolment and the areas of playgrounds and sports grounds thought desirable. Standards vary from country to country. The following tables summarize regulations in the United Kingdom, Puerto Rico, the Federal Republic of Germany and the United States.

1. The Metropolitan Toronto School Board, Study of Educational Facilities Report E. 1, 1968, Ryerson Press. p. 121.

UNITED KINGDOM

Junior schools (primary schools)
Areas of sites, paved areas and playing fields.

Pupils	80	120	160	200	240	280	320	400	440	480
Paved area in square feet	6,600	6,600	12,100	12,100	12,100	12,100	18,700	24,200	24,200	24,200
Site area in acres (1)	0.75	0.875	1.0	1.125	1.25	1.375	1.5	1.625	1.875	2.0
Grass playing fields area in acres	1.0	1.0	1.5	1.5	2.25	2.25	3.0	3.0	3.0	3.0
Min. total area in acres	1.75	1.875	2.5	2.625	3.5	3.625	4.5	4.625	4.875	5.0

Pupils	80	120	160	200	240	280	320	400	440	480
Paved area in square metres	613	613	1,124	1,124	1,124	1,124	1,737	2,248	2,248	2,248
Site area in hectares (1)	0.304	0.354	0.405	0.455	0.506	0.556	0.607	0.658	0.759	0.809
Grass playing fields area in hectares	0.405	0.405	0.607	0.607	0.911	0.911	1.214	1.214	1.214	1.214
Min. total area in hectares	0.709	0.759	1.012	1.062	1.417	1.467	1.821	1.872	1.973	2.023

1. This area includes the paved area, the area taken up by the buildings, car park, etc., that is all areas except the grass playing fields.

Taken from Playing Fields and Hard Surface Areas Building Bulletin No. 28, Department of Education and Science, HMSO, London, 1966.

UNITED KINGDOM

Secondary schools (mixed - boys and girls)
Areas of sites, paved areas and playing fields

Pupils under 16 years	150	300	450	600	750	900	1,050	1,200	1,350	1,500
Paved areas in square feet	19,900	19,900	34,200	34,200	39,200	44,200	49,200	54,200	59,200	64,200
Site area in acres(1)	1.5	2.0	3.0	3.75	4.5	5.25	6.0	6.75	7.5	8.25
Grass playing fields area in acres(2)	4.5	7.0	10.0	10.0	13.0	13.0	16.0	16.0	19.0	19.0
Min. total area in acres	6.0	9.0	13.0	13.75	17.5	18.25	22.0	22.75	26.5	27.25

Pupils under 16 years	150	300	450	600	750	900	1,050	1,200	1,350	1,500
Paved area in square metres	1,849	1,849	3,177	3,177	3,177	4,106	4,571	5,035	5,500	5,964
Site area in hectares(1)	0.607	0.809	1.214	1.517	1.821	2.124	2.428	2.732	3.035	3.339
Grass playing fields area in hectares(2)	1.821	2.833	4.047	4.047	5.261	5.261	6.475	6.475	7.689	7.689
Min. total area in hectares	2.428	3.642	5.261	5.564	7.082	7.385	8.903	9.207	10.724	11.028

1. This area includes the paved area, the area taken up by the buildings, car park, etc., that is all areas except the grass playing fields.
2. At least one-half of the playing field area should be grass. With certain provisos, the remainder may be provided with a hard porous surface, such surface counting for three times its actual area.

Taken from Playing Fields and Hard Surface Areas Building Bulletin No. 28, Department of Education and Science, HMSO, London, 1966.

PUERTO RICO

Primary schools,
Areas of sites and playing fields.

Total no. of classrooms	on one floor 8	10	12	on two floors 12	16	20	24
Min. site area in square metres(1)	2,400	3,000	3,600	3,000	4,000	5,000	6,000
Min. site area adjoining a park, in square metres(1)	2,400	2,700	3,000	2,000	2,400	2,700	3,000
Sports grounds area in square metres (1)	3,500	3,500	3,500	3,500	3,500	4,000	4,800
Min. total area in square metres(1)	5,900	6,200	6,500	5,500	5,900	6,700	7,800

Total no. of classrooms	on one floor 8	10	12	on two floors 12	16	20	24
Min. site area in acres(1)	0.593	0.741	0.889	0.741	0.988	1.234	1.481
Min. site area adjoining a park in acres	0.593	0.667	0.741	0.494	0.593	0.667	0.741
Sports grounds area in acres	0.864	0.864	0.864	0.864	0.864	0.988	1.185
Min. total area in acres(2)	1.457	1.531	1.605	1.358	1.457	1.655	1.926

1. This area includes the playgrounds, the gardens and the area taken up by the school buildings, that is all areas except the sports grounds.
2. The sum of the site area and the area of the sports grounds.

Taken from Normas de Procedimiento en la Planificación y Construcción de Escuelas Puerto Rico, 1961, p. 3 and 4.

Secondary schools,
Areas of sites and playing fields.

Total no. of classrooms	on one floor 8	10	12	on two floors 12	16	20	24
Min. site area in square metres(1)	2,400	3,000	3,600	3,000	4,000	5,000	6,000
Min. site areas adjoining a park, in square metres(1)	2,400	2,700	3,000	2,000	2,400	2,700	3,000
Sports grounds area in square metres(1)	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Min. total area in square metres	18,400	18,700	19,000	18,000	18,400	18,700	19,000

Secondary schools (cont.)

Total no. of classrooms	on one floor 8	10	12	on two floors 12	16	20	24
Min. site area in acres(1)	0.593	0.741	0.889	0.741	0.988	1.234	1.481
Min. site area adjoining a park in acres	0.593	0.667	0.741	0.494	0.593	0.667	0.741
Sports grounds area in acres	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Min. total area in acres(2)	4.543	4.617	4.691	4.444	4.543	4.617	4.691

1. This area includes the playgrounds, the gardens and the area taken up by the school buildings, that is all areas except the sports grounds.
2. The sum of the site area and the area of the sports grounds.

Taken from Normas de Procedimiento en la Planificación y Construcción de Escuelas, Puerto Rico, 1961, p. 3 and 4.

FEDERAL REPUBLIC OF GERMANY

In the Federal Republic of Germany, sports grounds are seen not especially as a part of the school but as community facilities. The standards below refer to the area of sports ground in relation to the total population, including children of school age.

Population	1,000	3,000	5,000	over 5,000
Area of sports ground in square metres	8,500	12,000	16,000	3.5 square metres per person

The site areas for all schools are as follows (including playgrounds for recreation but not sports grounds):

No. of classes	7	12	24	36
Site area in square metres	4,500	7,500	9,500	12,000
Site area when playground has all-weather surface, in square metres	4,500	6,000	8,000	10,000

Taken from SB, the official journal of the International Working Group for the Construction of Sports Premises, (IAKS) July 1969.

THE UNITED STATES OF AMERICA

Site areas for primary schools

State	Basic minimum area in square metres	Additional area for additional pupils
Arizona California Colorado Georgia Kansas New Jersey New York Texas	20,235 (5 acres)	4,047 square metres (1 acre) for each additional 100 pupils over the initial 100
Delaware	8,094 (2 acres)	
Florida	8,094 (2 acres)	4,047 square metres (1 acre) for each additional 50 pupils over the initial 50

These standards are rarely respected in inner core urban areas. New York City allows 2.79 square metres of playground per pupil in addition to the area taken up by the school building, the regulation car parks and setbacks. Even this much lower standard is not always respected.

Site areas for secondary schools

State	Basic minimum area in square metres	Additional area for additional pupils
Arizona Georgia Kansas	40,470 (10 acres)	4,047 square metres (1 acre) for each additional 100 pupils over the initial 100
California	121,410 (30 acres)	
Colorado Texas	60,705 (15 acres)	
Delaware	20,235 (5 acres)	
Florida	8,094 (2 acres)	4,047 square metres (1 acre) for each additional 50 pupils over the initial 50
New York	40,470 (10 acres)	8,094 square metres (2 acres) for each additional 100 pupils over the initial 100 up to 500, then 4,047 square metres (1 acre) for each additional 100

Taken from: "School Sites, Selection, Development and Utilization", United States Department of Health, Education and Welfare, Washington, D. C., 1962.

Climate

Most developing countries are in tropical or semi-tropical zones. Climates can be roughly divided into "warm-humid" and "hot-dry". The characteristics of these climates as far as they affect the construction of sports facilities are:

WARM HUMID	
day-time air temperatures:	30°C(85°F) to 32°C(90°F)
night-time air temperatures:	25°C(75°F) to 27°C(80°F)
relative humidity:	high, 55 to 100%
rainfall:	usually high, may exceed 508mm (20") in the wettest month; in a heavy storm 50 to 75mm (2" to 3") may fall in an hour
sky conditions:	cloudy, the sky can be very bright when thinly overcast
ground conditions:	luxuriant vegetation, abundant shade
soil conditions:	often damp, high water-table.
HOT DRY	
day-time air temperatures:	high, up to 38°C(100°F), often above skin temperature of human body
night-time air temperature:	16°C(60°F) to 25°C(75°F)
relative humidity:	low, 10 to 55%
rainfall:	low, little or no rain in the dry season; flash storms, in which up to 50mm (2") may fall, occur occasionally
ground conditions:	little vegetation, sparse shade
soil conditions:	ground very dry, dries rapidly after rain; water-table deep or non-existent.

Strenuous physical effort is difficult under tropical conditions. The body is using energy for cooling and under warm-humid conditions there is obviously a limit to this cooling effect.

Nevertheless, people's reactions to climate are largely subjective and the human body is amazingly adaptive. Mr. A. E. Arro of Zambia has noted that:

"Ten years ago topees (sun helmets) were a fairly common sight among the Europeans in the towns of Zambia. Almost every Rhodesian railway guard wore one. Nowadays hardly one is to be seen. In 1949, broad soft hats were the standard wear for Rhodesian school children. Today, the English cap and boater are much in evidence.

"There seems to be no doubt that the body does adapt itself quite adequately to warm temperatures if exposure is gradual and gentle. If the European is capable of strenuous physical effort under semi-tropical conditions, the African born in the country should not find working out of doors enervating or harmful. "(1)

This is not to say, if money were available, that schools in tropical areas should not have air-conditioned gymnasiums. There is as great a need for cooled gymnasiums in the tropics as there is for heated classrooms in a temperate climate. Physical effort is as much hampered by excessive heat as is mental effort by excessive cold. Unfortunately, because of lack of money and the low priority given to physical education in developing countries, the air-conditioned gymnasium is a dream.

However, temperatures fall towards evening, except in certain inland equatorial areas which have a very small daily temperature range. Temperature range is greatest in the hot-dry tropical zone. If sports grounds and areas for gymnastics were floodlit and physical education periods scheduled for the evening, sports and physical education could be practised under even more agreeable conditions than in an air-conditioned sports hall.

1. Eighth International Congress, op. cit. p. 64.

Calculation of spaces needed for physical education

The number of gymnasium teaching stations required is calculated in the same way as space for any other subject. If each student has two periods of physical education per week, if the school week has twenty-five periods, and the school has forty classes, then:

$$\text{Min. number of teaching stations} = \text{no. of classes in the school} \times \frac{\text{periods of P. E. per week}}{\text{total periods per week}}$$

$$= 40 \times \frac{2}{25}$$

$$= 3.2$$

Since a fraction of a teaching station is impractical, four teaching stations would be required. The four teaching stations could consist of a gymnasium with two teaching stations, a swimming pool, and a room for dance.

The following are standards from France and the Federal Republic of Germany for the provision of gymnasiums, and for the areas of gymnasiums.

FRANCE

No. of classes		No. of teaching stations	size of gymnasium (metres)
Primary school	Secondary school		
10 to 20	less than 12	1	11.5 x 20
20 to 30	12 to 20	2	20 x 30
30 to 45	20 to 45	3	either 1 - 11.5 x 20 and 1 - 20 x 30 or 1 - 30 x 40
above 45		1 extra station per 15 classes	

FEDERAL REPUBLIC OF GERMANY

All schools

No. of classes	No. of teaching stations	size of gymnasium (metres)
less than 3	1	9 x 12
4 to 7	1	10 x 18
8 to 12	1	12 x 24 or 15 x 27 or 18 x 33
13 to 24	2	2 - 12 x 24, or 1 - 12 x 24 and 1 - 15 x 27, or 1 - 18 x 33, or 1 - 21 x 42
25 to 36	3	1 - 18 x 33 and 1 - 12 x 24, or 1 - 21 x 42 and 1 - 10 x 18, or 1 - 27 x 45

Sports grounds

Grounds and pitches for small-team games: This section should contain dimensional data in respect of badminton, basketball, boxing, fencing, handball, judo, netball, squash, table tennis, lawn tennis, volleyball, and wrestling.

These games are played internationally according to a 72-nation survey: "Physical Education in the School Curriculum", ICHPER International Questionnaire Report. Basketball and volleyball are the two most popular games.

Pitches are oriented to avoid players having the sun in their eyes; this means that for games with nets, such as tennis and badminton, the net is orientated east/west. This criterion has less importance towards the equator, where the sun is low in the sky for only short periods of the day.

Grounds and fields for athletics and large-team games: This section should contain dimensional data on running tracks, the standard 400-metre track and smaller ones for schools with limited sites. It should contain dimensional data for baseball, cricket, hockey, lacrosse, rounders, rugby football, soccer, softball, and speedball.

This list is taken from: "Physical Education in the School Curriculum", ICHPER International Questionnaire Report.

Soccer is by far the most popular game.

Hard porous and all-weather surfaces: The period of use for grassed playing fields is limited to five or six hours per week. They cannot be played on for several hours after a rainstorm. This has led to the introduction of non-turf surfaces. These are of three basic types:

Waterbound: A pervious surface composed of suitable crushed stone, brick or similar material dependent on hygroscopic action for stability. Must be maintained regularly.

Semi-porous: A surface of hard granular composition which does not rely on moisture for stability but which may require regular or occasional maintenance.

All-weather surfaces: Any durable maintenance free surface not seriously affected by weather or temperature. It may be monolithic with rough, smooth, fibrous or pile finish, or of granular or fibrous composition stabilized with tar, bitumen, asphalt, cement or plastic. Such surfaces can be porous or impervious; resilient or non-resilient. The method of laying varies and may be in slab, sheet or tile form or poured on the site.

Two books deal exhaustively with these surfaces; they are: "Etablissement et Entretien des Sols en Plein Air", published by the Ministère de la Jeunesse et des Sports, Paris, and "Notes on Hard Porous and All-Weather Surfaces for Outdoor Recreation", published by the National Playing Fields Association, London.

The use of non-turf surfaces will increase in developing countries if the use of floodlighting increases. It will usually not be possible to floodlight more than one pitch, which will then be used intensively.

There is a need for supplementary information for developing countries where certain materials such as cinders and crushed brick do not exist.

The laboratory of the "Service Technique de l'Equipment", 11 Avenue Tremblay, Paris, 12, makes analyses of soil for constructors of playing fields in France, to find out their mineral, chemical and granular composition, then sends back a list of materials to be added to stabilize the soil. This is the simplest way of making a hard surface playing field. The laboratory would be prepared to do a limited number of analyses for schools in French-speaking territories.

Turf: The growing, drainage and maintenance of sports turf in tropical areas is a specialized study. The Agricultural Research Service, Georgia Coastal Plain Experiment Station, Tifton (Georgia) U. S. A., has done work on this subject. They have developed several mixes of grass seed suitable for sports turf in the Southern United States and tropical countries.

Specialists from the Tifton Research Station should be invited to write this section in the final handbook.

Landscaping: The landscaping of sports facilities is extremely important. It has more than aesthetic value; planting can be used as a means of controlling climate and for the control of winds. Closely planted trees can form wind-breaks that reduce wind velocity by as much as 20 per cent. Vegetation can also act as a dust filter; measurements have shown that a 600-foot wide belt of planting can reduce the dust count by as much as 75 per cent. Even lawns act as dust filters and of course prevent the generation of dust. Trees give shade and generally tend to reduce heat by vaporization of moisture from their foliage.

Methods of environmental control through planting are outlined in "Shelter for Physical Education" by The Architectural Research Group, the Texas A & M College, and in "Environmental Control in School Building through Planting" by Rooskander Winant, Unesco, Bangkok.

Planting can also be used to divide one area from another, to divide the tennis courts from the cricket pitches, or the sports fields from the rest of the school.

Chapter 9 of the book "Etablissement et Entretien des Sols en Plein Air", published by the Ministère de la Jeunesse et des Sports, Paris, deals with landscaping under the following headings:

Classification of trees; planting distances; classification of planting; hedges; planting on slopes; selection of shrubs in the nursery; transplanting;

the transport of shrubs; favourable periods for transplanting; planting; lawns; protection of lawns; care of plants and trees; list of trees and shrubs with their characteristics.

It should be possible to write a similar chapter on tropical landscaping, using the same headings with the addition of a section on environmental control.

Lighting: The lighting of sports facilities in developing tropical countries is important since it means that physical education and sports can be practised in the cool of the evening - a cheap form of air-conditioning.

This section should be written by a specialist.

Apparatus and equipment for games and athletics: Posts and nets for games, hurdles and other apparatus can usually be produced locally for less than imported equipment. It is therefore important to have exact specifications to give to local workmen. "Aménagements Sportifs - 1960", published by the Ministère de l'Education Nationale, Paris, now out of print, contains simple drawings and specifications for the following:

balancing beams, frames for climbing, suspension beams, soccer and hockey goal posts, rugby goal posts, volleyball nets and posts, basketball posts and nets, high-jump hurdles, tennis posts and nets, stops for shot-put, etc.

These drawings might be copied with any necessary changes and additions and then reissued as part of the handbook.

Outdoor and limited-shelter gymnasiums, spaces for dance

Outdoor gymnasiums: There is no need in most tropical climates for the enclosed gymnasiums of temperate zones. Most physical education in developing countries takes place on a rough piece of ground. This can be modified so that it becomes a suitable place for physical education and gymnastics. It is surely more appropriate to do gymnastics in the open, surrounded by trees and sky, than in the artificial environment of an enclosed gymnasium. Physical education in the open also makes a clear break with the other activities of the day which take place within buildings.

This space would be used mainly for gymnastics; games being played elsewhere. Dance needs a different sort of space and will be dealt with later.

The disadvantages of a rough piece of ground can be dealt with in the following way:

The rough surface: The British handbook "Secondary School Design - Physical Education", Building Bulletin 26, published by the Department of Education and Science, London, has this to say:

"The floor is considered by most physical education teachers to be the most important feature of a gymnasium. Not only must it give safe foothold but it must be suitable for people to sit, lie and roll on as well as to work on in bare feet. Probably no better material is likely soon to be found than hardwood strip."

Nevertheless, several artificial materials now exist which have most of the qualities of a good wooden floor, and at the same time stand up to exterior conditions. Research will be needed to find the material most suitable for tropical conditions.

Excessive heat and sun: A certain amount of shade can be given by trees which also reduce heat by vaporization of moisture given off by their foliage. Trees judiciously planted give shade and need not interfere with physical education activities. Protection from low-level sun can be obtained by planting on the edge of the area. The actual uninterrupted areas, in the round, needed for gymnastics are quite small. Most work needs length - vaulting for example. The gymnasium could follow the layout of an army assault course, or be hexagonal as proposed in a recent Dutch "Bouwcentrum" study. (1)

Dust and wind: Here again vegetation is useful, as explained earlier.

Climbing apparatus would have to be three-dimensional. Showers and changing rooms should be near at hand. Spectator seating could be formed of banks of earth, stabilized with concrete sprayed on expanded metal. It would be useful to install floodlighting so that physical education periods can take place in the cool of the evening.

Limited-shelter gymnasiums: A limited-shelter gymnasium is a gymnasium that has a floor and a roof as protection against sun and rain but no walls.

In addition to gymnastics, the space may be used for small team games. Pitches for small team games are often overlaid in the same area to economize space and expensive surfaces.

The following pitches can be provided in a space 24 x 33.5 m (79' x 110'): 6 badminton, 1 basketball, 1 lawn tennis, 1 pitch for five-a-side football, and 1 netball pitch.

The following pitches can be provided in a space 15 x 24.50m (49'6" x 80'): 3 badminton, 1 basketball, and 3 cricket nets.

The following can be provided in a space 31.50 x 16.50m (104' x 54'): 1 netball, 1 lawn tennis (but with only 13' run bank and 9' each side), 1 basketball, and 4 cricket nets.

(Taken from "Secondary School Design - Physical Education", Building Bulletin 26. HMSO, London.)

The publication, "Gymnase et Salle de Sport", (Ministère de la Jeunesse et des Sports, Paris) notes that:

1. Stichting Informatiecentrum Voor Scholenbouw, op. cit.

The following pitches may be provided in a space 30 x 20 x 6m high (98' x 65'6" x 19'6" high): 1 basketball, 1 volleyball, and 2 training pitches for volleyball.

The following pitches can be provided in a space 40 x 20 x 7m (131' x 65'6" x 23' high). For competitions a sports hall measuring 44 x 24 x 9m high (144' x 79' x 29'6") is recommended: 1 basketball, 1 volleyball, 1 lawn tennis, 1 handball, and 3 training pitches for volleyball.

When so many pitches are superimposed, the problem arises of how to separate, visually, one line from another. It is recommended that white be used for tennis, light yellow for handball, red-orange for basketball, and sky blue for volleyball.

When two lines of a different colour cross, priority must be given to the darkest colour, an exception being made for white which is given priority over all other colours.

The handbook should contain diagrams showing how floors can be marked to combine pitches and save space.

The roof can be either of conventional sheet materials (steel, asbestos or aluminium) on a structure of timber, steel or concrete, or vinyl-coated nylon on a catenary tension structure of steel cables. Photos. 10 and 11 show a swimming pool in Paris roofed in this way. The floor could be any of a variety of materials. The handbook should contain a comparative study of roof and floor materials.

The English handbooks show jumping pits in gymnasium floors. The French documentation states that on no account should jumping pits be cut in gymnasium floors. It seems more reasonable, in a tropical climate, to follow the French advice.

Area for Dance and Drama: Dance is a very important part of physical education programmes in developing countries, not only national dance but dramatic and classical dancing, ballet and folk dances from other countries.

Dance needs a different sort of space from physical education. Ideas on open-air spaces for dancing will vary but a good floor is essential and there should be some form of enclosure - hedges, walls or moveable screens. The shape of the area will influence the flow of movement, e.g. circular space pay tend to draw the movement in too strongly; a long narrow space may draw it out too linearly; a completely square space may be too static.

The Freinet school at Vence, France has a good example of a dance area.

Swimming pools and beaches

There is a great lack of swimming pools and other places to swim. The majority of schools would like to teach swimming, which is part of the school curriculum, but lack the facilities.

The handbook should contain: dimensional data for the construction of instructional swimming pools; details of the construction of a simple concrete-lined swimming pool; details explaining the construction of cribs (these are structures in timber that can be immersed in rivers and lakes to make them safe for swimming instruction. The use of cribs is limited because water in tropical areas so often contains parasites and water-borne diseases); construction details of equipment - ladders, diving boards, starting blocks, etc.; information on methods of filtration and water treatment.

Changing facilities

Students are required to change into special clothing for physical education in 90 per cent of the countries replying to the ICHPER questionnaire(1), but lack of facilities often makes this impossible. There is a great need for changing rooms and showers.

The Canadian handbook "Physical Education Facilities for Elementary Schools" has a well-documented section on changing room and shower facilities, (p. 14 to 21). This could form the basis of the section on changing facilities in the handbook.

The water in showers should not have a temperature lower than 27°C., 80°F. Cold showers after vigorous physical exercise, in a tropical climate, are not advisable. As a cheap method of obtaining hot water, various methods of solar heating should be investigated.

Maintenance

In the enthusiasm of developing new programmes, human and capital resources can be found to build new facilities. It is less easy, however, to maintain existing ones. Recurrent budgets must be provided, permanent ground-keepers hired, volunteer help solicited. In developing countries where limited resources are almost entirely devoted to new capital investments, maintenance is too often overlooked.

1. ICHPER, op. cit.

APPENDIX 1

ADDRESSES OF ORGANIZATIONS WHERE TECHNICAL INFORMATION MAY BE OBTAINED

Unesco, Educational Facilities, Department of Planning and Financing of Education, Place de Fontenoy, Paris 75700.

CONESCAL, Centro Regional de Construcciones Escolares para América Latina, Apartado Postal 41-518, México, 5, D. F.

REBIA, Regional Educational Building Institute for Africa, P. O. Box 1720, Khartoum, Sudan.

ARISBR, Asian Regional Institute for School Building Research, P. O. Box 1368, Colombo, Ceylon.

IAKS, The International Working Group for the Construction of Sports Facilities, Institut für Sportstättenbau, Carl Diem Weg, Köln-Müngersdorf, Federal Republic of Germany.

Mitteilungsblatt des Österreichischen, Instituts für Schul-und Sportstättenbau, Wien 4, Prinz Eugen-Strasse 12, Austria.

Stichting Informatiecentrum Voor Scholenbouw, Bouwcentrum Weena 700, Rotterdam, Postbus 299, Netherlands.

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APPENDIX 2

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