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Architecture of Schools

THE NEW LEARNING ENVIRONMENTS

Mark Dudek



Architectural Press

OXFORD AUCKLAND BOSTON JOHANNESBURG MELBOURNE NEW DELHI

the primary focus within the text (Chapters 1–4) is the UK scenario. This is an inevitable response to a political climate which has brought the condition of schools, and the state education system, to the forefront. I believe the debate holds valuable lessons for anyone designing or commissioning new schools, wherever they may be.

Although the theoretical chapters focus in the main on the UK education debate, the case studies are international in scope, exploring the 'state of the art' in current new school design. It is accepted that, in reality, most school development within the UK will take place in and around existing school sites. The case studies, therefore, focus on both new schools built over the past decade and significant new extensions to existing premises.

The word 'environment' is used to define the total space within which children learn, not just architecture and landscape architecture. This implies an integration between equipment and furniture, buildings and the urban, suburban or rural context within which schools are located.

Throughout the text I am concerned with provision for mass education within the state sector. However, I make reference to some private provision, as relevant exemplars.

Notes

- 1 It is important to recognize how early educational ideas spread beyond the present somewhat parochial regional or national systems. The ideas of early educators such as Froebel, Pestalozzi and Dewey had a profound influence on the developing practice of education throughout the world. Today educational theory is disseminated within academic circles by way of the Internet, publications and international conferences. However this elevated academic sphere appears to have little direct impact upon the everyday practice of education, which is driven by a more pragmatic ethos. This often focuses upon health and safety legislation at the expense of imagination and experimentation.
- 2 As quoted in Beck, U. and Beck-Gernsheim, E., *The Normal Chaos of Love* Polity Press, 1995, pp. 143–144.
- 3 To every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal and directed to contrary parts. Isaac Newton, *Principia Mathematica*.

Part A

1

Origins and significant historical developments

Introduction

The naturalistic settings sought for education at the beginning of the century, seen in early examples such as the open-air, Steiner and Montessori schools, all carried within them themes which run throughout the history of twentieth century school architecture. Initially viewed as an issue relating merely to hygiene and the spiritual well-being of underprivileged children in the newly industrialized cities, the desire to make the experience of education more suitable to young children broadened to encompass other concerns. From the 1920s these included a growing interest in child psychology and a more enlightened approach to the educational needs of large pupil numbers within the expanding cities.

To balance these radical impulses, it can be said that the more privileged private education systems tended to maintain an approach to buildings for education which deliberately set out to make them institutionalizing in their own right. This could be seen particularly in the English public school tradition, where strict hierarchies were reflected by an architecture which changed little within the intervening decades of the nineteenth and twentieth centuries. How to de-institutionalize the institution can be seen as a significant topic within the evolving theory of school design elsewhere.

Within this chapter I explore some of the more enduring themes represented by both the radical and the traditional wings, viewed through the most influential buildings and architects. I do not set out to present a detailed account of the history of school architecture. Rather, I describe some of the recurring educational and social concepts which enabled architects to respond in specific and distinctive ways to the needs of children in mass education.

To begin I consider briefly the roots of an architecture for education, not by way of the first dedicated school buildings, but within the framework of an anthropological

view of space as defined by Edward T. Hall and his analysis of the house:

People who 'live in a mess' or a 'constant state of confusion' are those who fail to classify activities and artefacts according to a uniform, consistent or predictable spatial plan. At the opposite end of the scale is the assembly line, a precise organization of objects in time and space.¹

Hall's dialectical arguments may quite easily refer to contemporary school design, which has reached a point where rooms and spaces are intended to meet precise functional needs, and the function of school is framed in neat periods of time, dedicated to specific subject areas. If a modern secondary school comprises as many as twenty specific areas for teaching (aside from numerous smaller ancillary areas), although the outcome of education may be predictable, it also suggests that the range of activities is encouraging a broad and interesting form of education, which nevertheless encompasses large measures of control. It is, however, far removed from the mono-functional spaces of the factory floor or, as we will see, the first schools with their provision of large schoolrooms in which hundreds of children could assemble for instruction at one time.

The implication of Hall's analysis of function relating to the house, where there are special rooms for special functions, does however determine a modernist conception of how people should live their lives. Rooms in the house are allocated specifically to cooking, eating, lounging/entertaining, rest, recuperation/procreation and sanitation. These are functions so precise that they might set the agenda for life. They can impose mental straitjackets. Life is framed by the environments within which it is set; an order is established levelling and stultifying the possibility for wider social interaction, the source from which education springs. Seen in these terms, there is little or no possibility for the form to be interpreted imaginatively. If the



Figure 1.1a
Tehtaanmäki Elementary School, Anvalankoski (formerly the County of Inkeroinen), Finland. Designed by Alvar Aalto in 1938, view of the double height entrance hall with second floor balcony. The foyer level is in fact a raised ground floor due to the sloping site with a gym and changing facilities at the ground/basement level. The architect was absent from the construction, overseeing the development of Villa Mairea and the Finnish Pavilion; however, it is an important example of school design in the early modernist style which subsequently became very influential. (Photograph courtesy of Anjalankosken Sanomat. The plans were drawn by Susanna Salmela.)

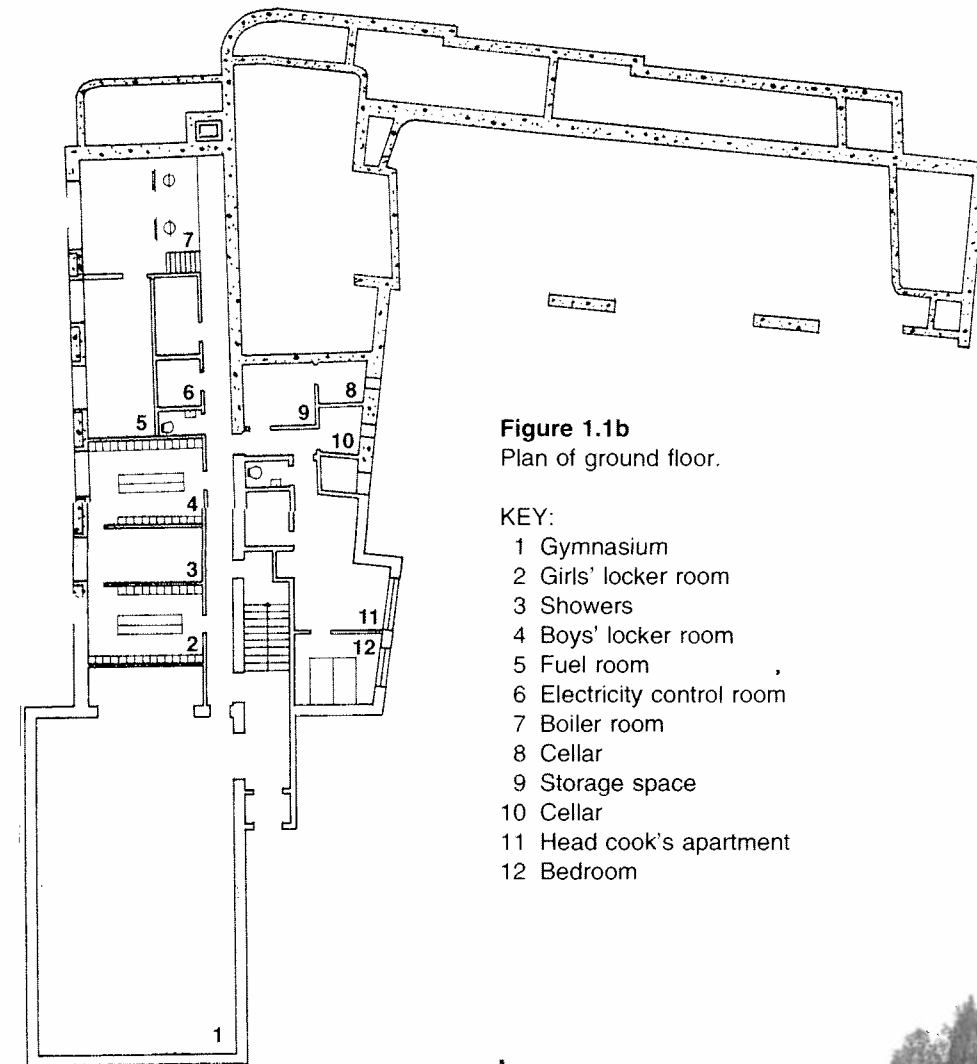


Figure 1.1b
Plan of ground floor.

- KEY:
- 1 Gymnasium
 - 2 Girls' locker room
 - 3 Showers
 - 4 Boys' locker room
 - 5 Fuel room
 - 6 Electricity control room
 - 7 Boiler room
 - 8 Cellar
 - 9 Storage space
 - 10 Cellar
 - 11 Head cook's apartment
 - 12 Bedroom



Figure 1.1c
View towards double height entrance hall with the main classroom block on the right.

Figure 1.1d
Plan of third floor.

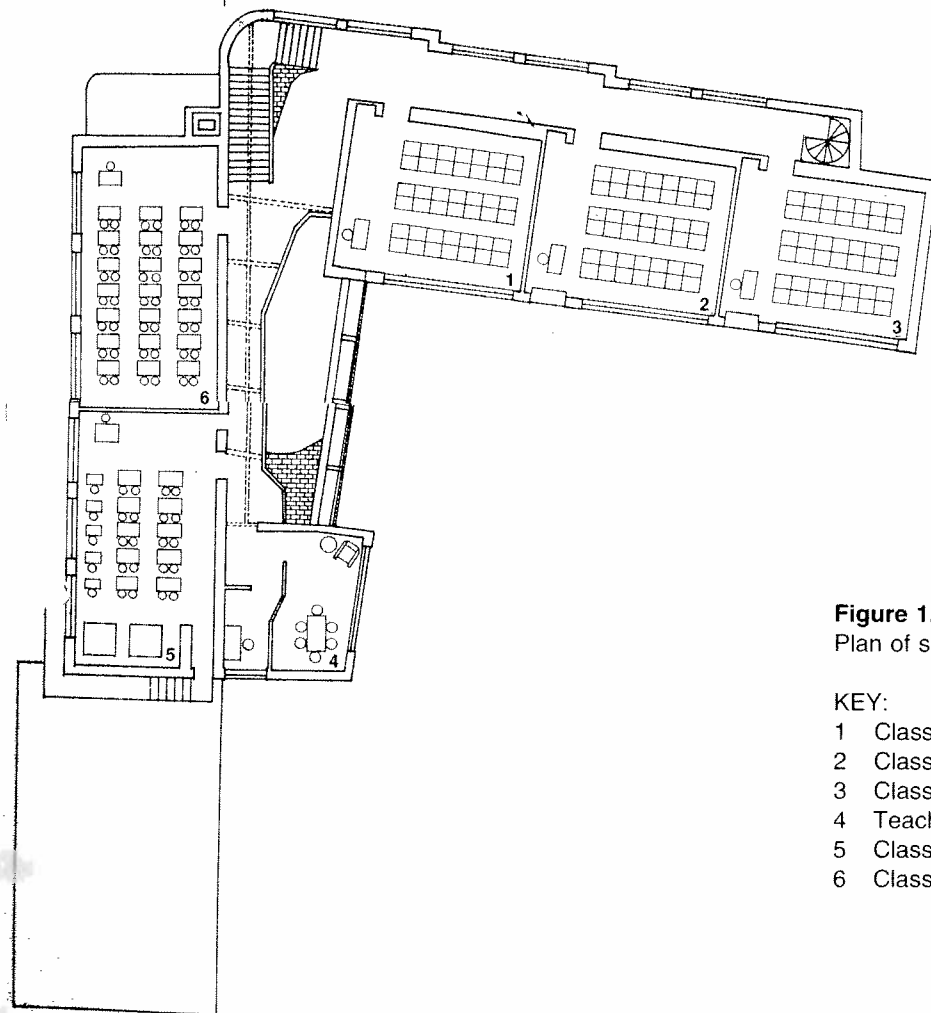
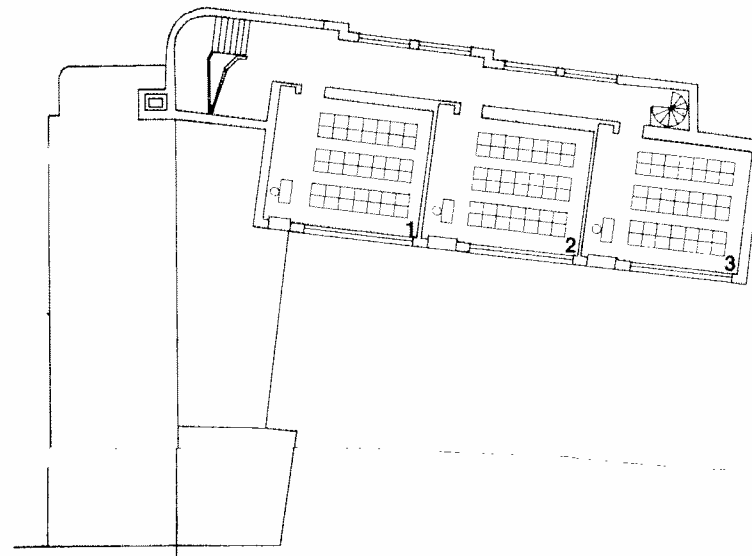


Figure 1.1e
Plan of second floor.

- KEY:
- 1 Classroom
 - 2 Classroom
 - 3 Classroom
 - 4 Teachers' lounge
 - 5 Classroom
 - 6 Classroom

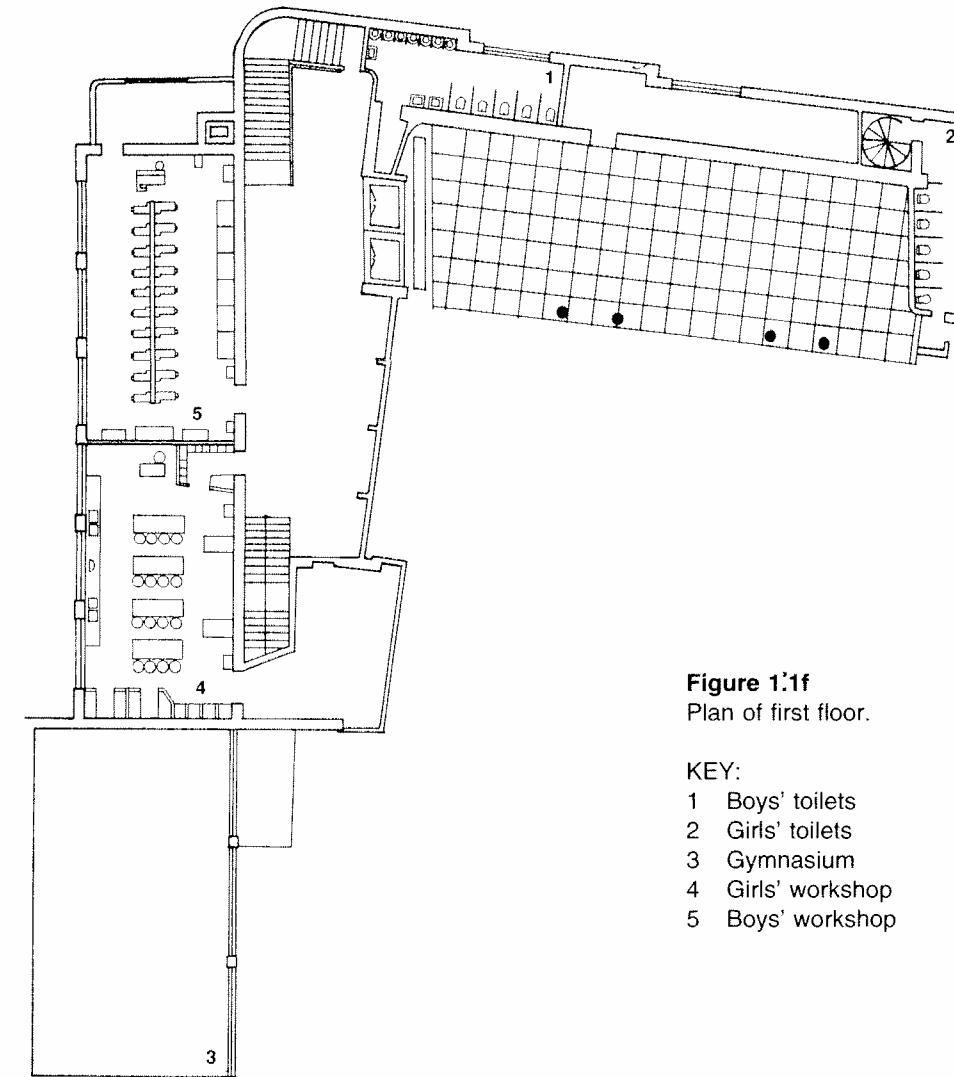


Figure 1.1f
Plan of first floor.

- KEY:
- 1 Boys' toilets
 - 2 Girls' toilets
 - 3 Gymnasium
 - 4 Girls' workshop
 - 5 Boys' workshop

school is based upon a similar mono-functional model to the house, it may also have a negative effect on the personal development of the child.

Dutch architect Herman Hertzberger, who has made a significant contribution to the architecture of schools, puts it this way: *'... a thing exclusively made for one purpose, suppresses the individual because it tells him exactly how it is to be used. If the object provokes a person to determine in what way he wants to use it, it will strengthen his self identity. Merely the act of discovery elicits greater awareness. Therefore a form must be interpretable – in the sense that it must be conditioned to play a changing role.'* This defines the essential dialectic at work within the history of school design during the nineteenth and the early part of the twentieth century: on the one hand, the urge to impose discipline and control through a resolute set of spaces; on

the other, the emerging desire to encourage individual creativity by the production of buildings which were not enclosing and confining. Rather they opened themselves up to the surrounding context, its gardens and external areas, which themselves became a fundamental part of the 'learning environment'. Social interaction, rather than autonomous isolation, became the educational strategy embodied in Hertzberger's influential school buildings of the 1980s.

As with the school, the house as a functional layout with a deterministic programme, which is now taken for granted, is a relatively recent interpretation. Philippe Aries' *Centuries of Childhood* points out that rooms in European houses had no fixed function until the eighteenth century. He asserts that, before this time, people came and went relatively freely within dwelling

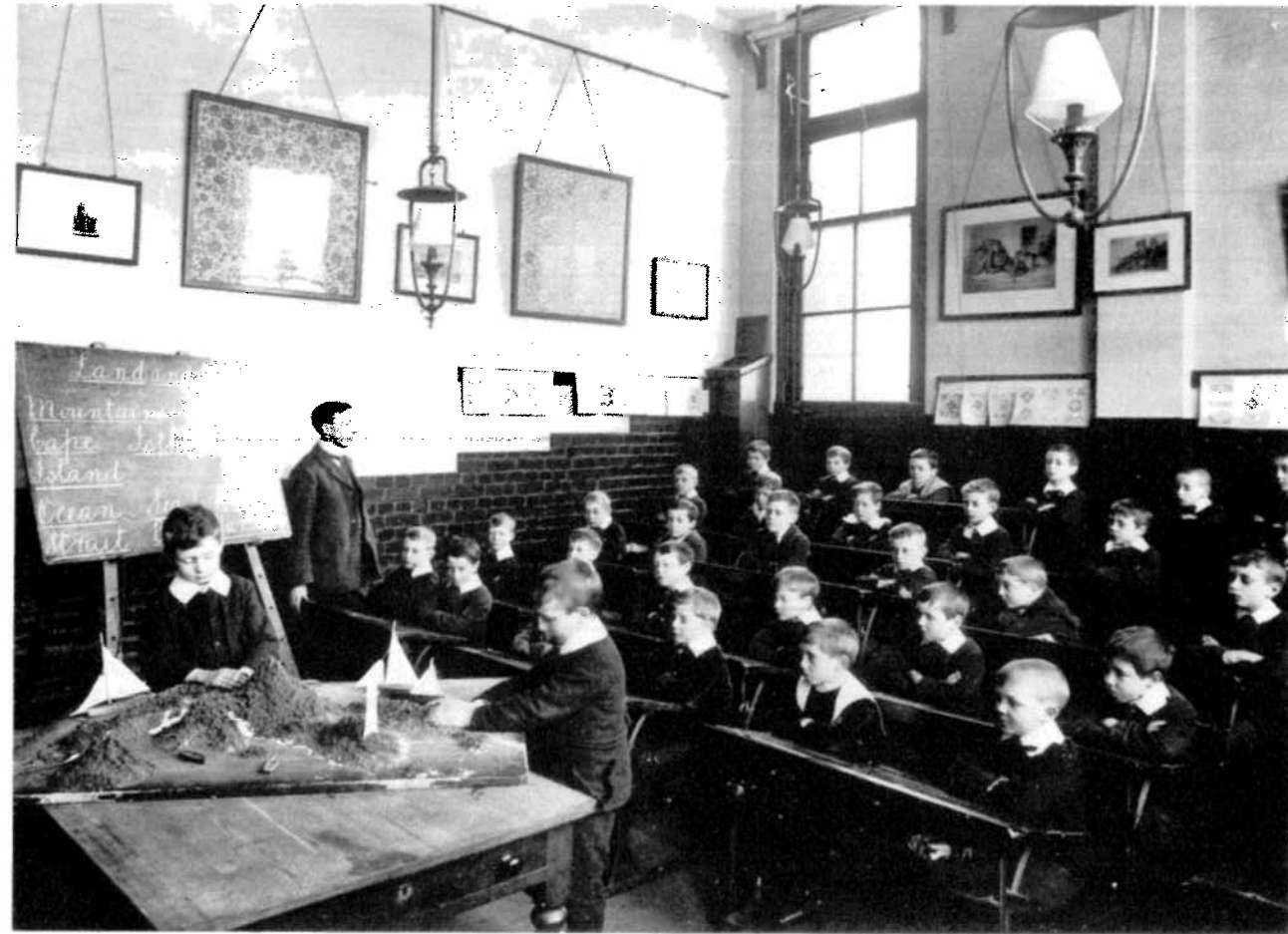


Figure 1.2
Geography lesson at Alma School, 1908. (© GLC.)

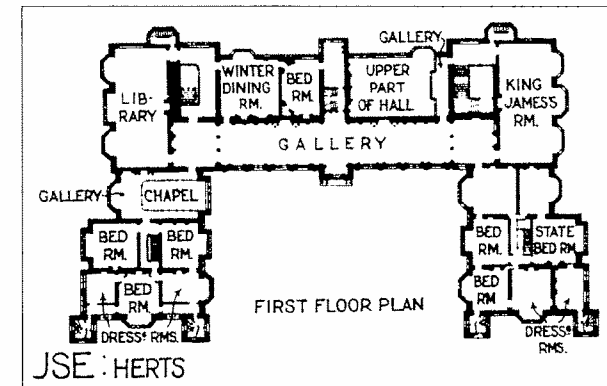
houses. Beds were set up whenever they were needed. There were no spaces that were specialized or sacred. Certainly there were no rooms or buildings dedicated to the education and development of younger children. The 'school', for most children of the middle ages, was the everyday world they inhabited.

Nevertheless, in eighteenth century western societies the home began to take on characteristics of its present form. Rooms were identified as being bedrooms, dining rooms and kitchens, each having their own function. Furthermore, the concept of the corridor came into being. This was a rationalization of the communal meeting place (around the entrance) or hall, which had been the original all-purpose living/sleeping/eating area. The corridor enabled private activities to evolve and the house took on the form of an internal street, with rooms arranged in an orderly form along either side. The children's playroom or nursery would often double as their sleeping area,

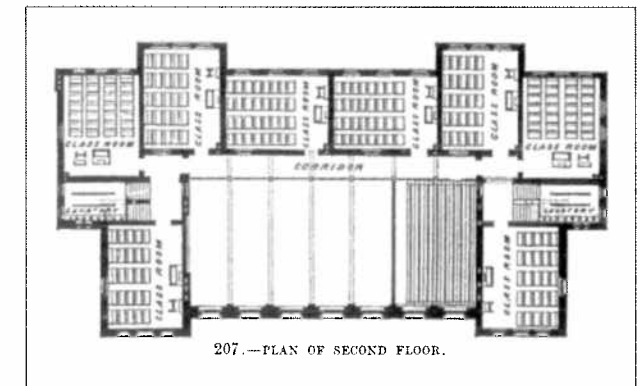
enabling children's games to develop and evolve over extended periods of time.

Often it would be treated as a private territory, a little house in its own right. The room was a secure microcosm of the home itself, with its own social hierarchies played out between brothers, sisters and childhood friends. It would become an important mechanism in the development of social competence, safe from the outside world yet capable of replicating some of its difficulties and complexities. According to Hall, man's knowledge and control of space, which he describes as being 'orientated' is a fundamental characteristic of this social development. Without this sense of control of one's environment, to be disorientated in space, is the distinction between survival and sanity: 'To be disorientated in space is to be psychotic.'

Hall describes this conception as *fixed feature space*. There is no denying the effect this has upon the psychology of the child, indeed on our society as a whole. Winston



a



b

Figure 1.3a and b
First floor plan of Hatfield House, Herts, 1607-11, taken from *A History of Architecture* by Banister Fletcher (Figure 1.3a). Compare this with the plan of a typical Robson School, 1911. (*School Architecture*, E.R. Robson.)



Figure 1.3c
Bonner Street Primary School, Hackney, London, designed by Robson in 1875. An early example which is still in use today. Although added to and extended on a number of occasions in the years after it opened, the building adapted well to curriculum needs, providing a robust workable environment. Despite the contextual additions, the most significant losses are the tall chimney stacks and bell tower which gave the original composition a romantic castelated quality.



Figure 1.3d
Detail of the giant gable ends protruding up towards the pitched roof.



Figure 1.4
Whiteley Woods
Open Air School,
Sheffield, 1911. (*The
English School,
1870–1970,*
Seaborne and Lowe.)
Both settings show
the school master
and mistresses
positioned to control
and supervise;
however, the
Whiteley Woods
image suggests a
more spacious
approach to the
environment. (*The
English School,
1370–1870,* Malcolm
Seaborne.)

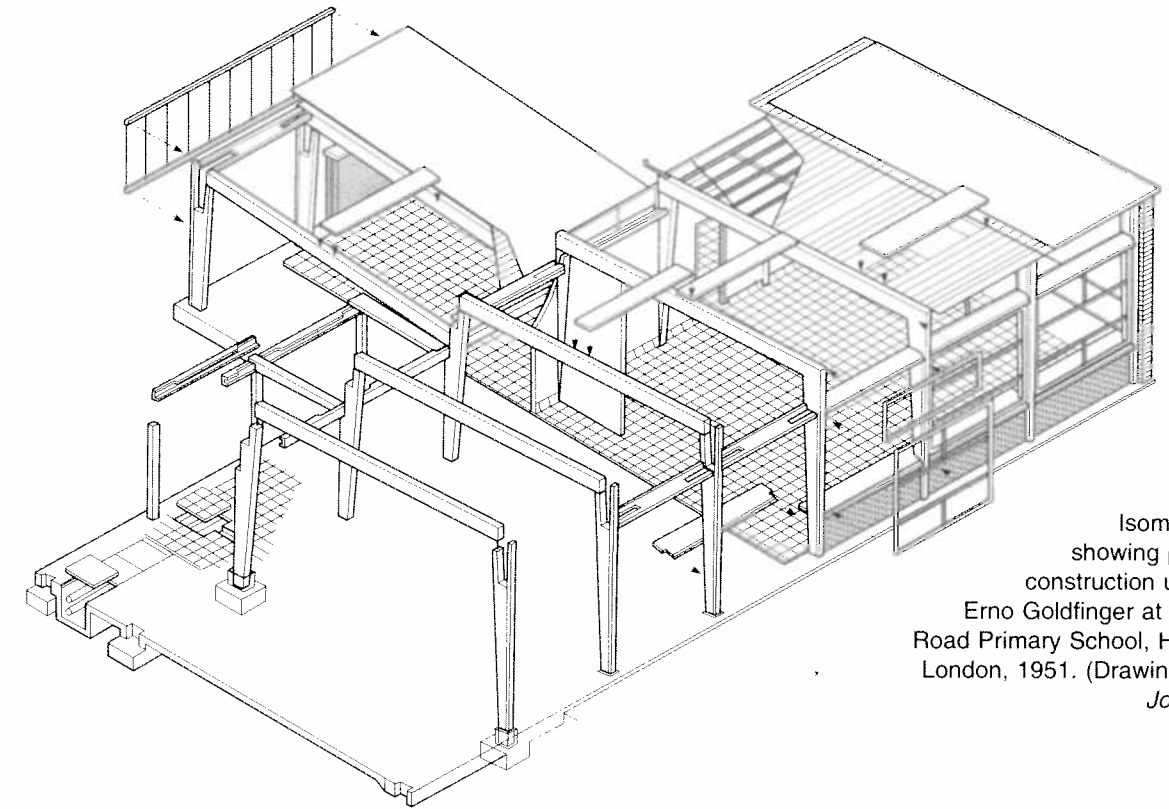


Figure 1.6a
Isometric drawing
showing prefabricated
construction units used by
Erno Goldfinger at the Westville
Road Primary School, Hammersmith
London, 1951. (Drawing: *Architect's
Journal*, 1951.)

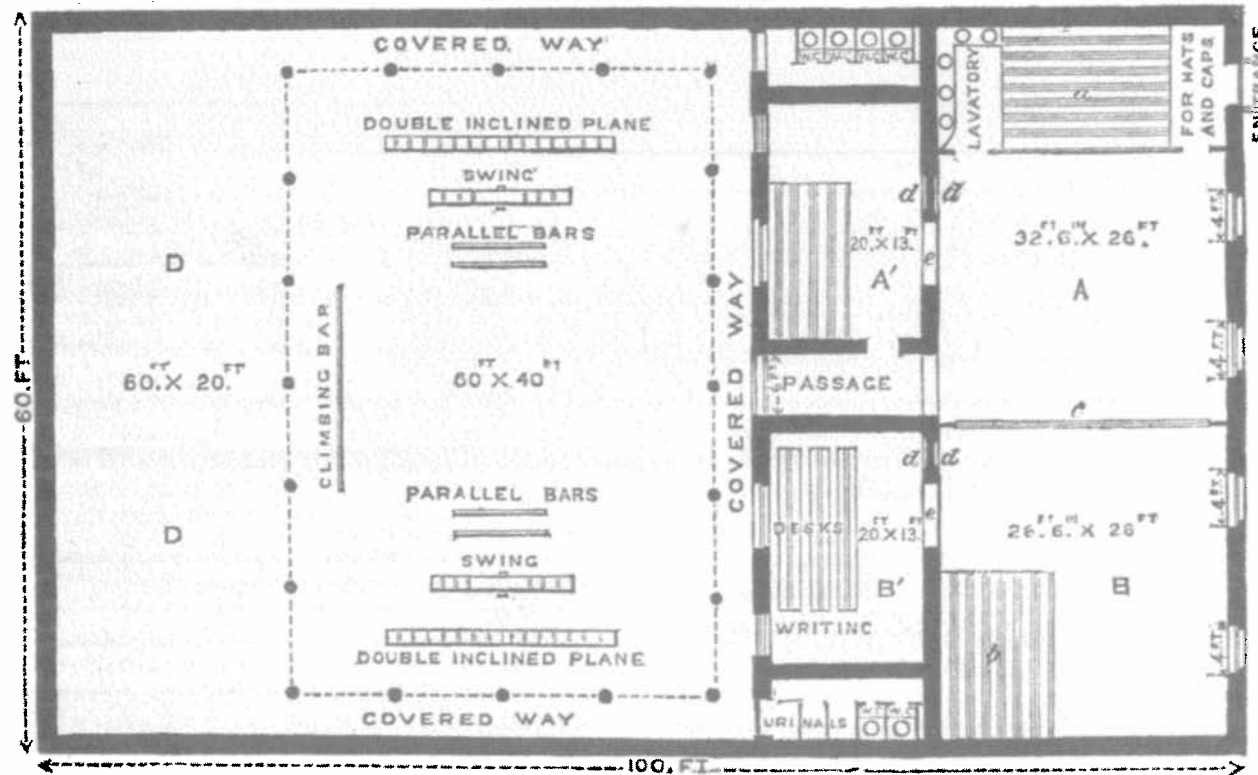


Figure 1.5
Plan of school playground suggested by the Home and Colonial Society. Each of five types of apparatus (four shown), are prescribed for different aged children in this highly ordered layout.



Figure 1.6b
The school as it is today. With its draughty single-glazed windows and poorly insulated roof, the fabric does not meet modern environmental standards; its prefabricated form of construction makes it difficult to refurbish, however its organization and internal scale works well. (Photo: © Mark Dudek.)

Churchill's oft repeated dictum, 'We shape our buildings and they shape us' is never more apposite than when it is applied to the first schools.³ Austere they may have been, but the first board schools designed by E.R. Robson inadvertently adopted a model based around the form of the eighteenth century house, with individual (class) rooms, clearly articulated circulation routes and a large assembly hall at its heart. They had an ordered configuration which was an essential characteristic of the educational process itself, establishing a framework for both. Many aspects of this conjunction prevail to this time.

This interpretation can also be applied to the wider urban environment. For example, the ways in which civic buildings such as town halls, churches, prisons and recreational buildings assumed a particular architectural language, which helped to impose a social hierarchy upon the nineteenth century city. This could be seen particularly in the architectural styles adopted for the earliest elementary schools in England at that time, with the use of Tudor gothic for the Anglican Proprietary schools in towns such as Sheffield, Liverpool and Leicester. This was often countered by nonconformist schools in the same towns adopting Italianate or Palladian styles. Whatever the style, the end result was one of calm, slightly overbearing order, a reflection perhaps of the existing social hierarchy.

Although the styles reflected an interdenominational rivalry, the school spaces themselves were essentially similar, exhibiting the primary characteristics of that most essential example of fixed feature space, the nineteenth century schoolroom. For urban children, exuberance and pure unadulterated play were the domain of the pre-school, the home environment and the street. The school house was intended to be a sober antidote to this, with a single school master imposing strict discipline. The extent to which it is appropriate to determine the form of a classroom on the basis of control is a debate which will be developed in more detail in Chapter 2. However, the notion of a fixed feature space as deterministic as the early schoolroom was, I will argue, central to the actual form of the education.

If the school is essentially concerned with imposing discipline, this conjures up the notion of children being moulded through education to be factory fodder, which would clearly neutralize the potential for school to develop creativity and freedom of expression as part of the educational process. Relating a specific range of functions to a particular space, such as a classroom, in too precise a structure is analogous to the architectural design guide complete with its so-called 'generic plans'. It can smother creativity for both the architect designing the space and the teacher who must use it as the context for teaching, since the plans can be copied to create a single model which takes no account of the context, the physical and social particularities of the site or the creative aspirations of its designer.

To reiterate, the overriding need to provide for large numbers in education is and remains the prevailing

requirement throughout the first two hundred years of school design. The constructional technology adopted ranged between two extremes: on the one hand, heavy traditional structures, which were robust but inflexible. On the other extreme, lightweight modernist conceptions which were quick and relatively cheap to build, but had all kinds of constructional and environmental shortcomings. A similar educational dichotomy can be discerned, which pitched traditional teaching methods against more progressive experimental approaches. The relationship between the educational experience and the architectural context was, and is to this day, understated. As I will argue, it was a reciprocal partnership – one feeding off the other in both negative and positive ways.

The notion of designing a children's environment, such as a school, which does not facilitate a degree of imaginative interpretation, or one which does not allow children to develop their own spontaneity, chance meetings and interactions with their peers, may fail to engender interest in education amongst the pupil body. Child-only spaces, which can be seen in many of the case studies, show children that they too have their own identity and value. These spaces are complementary to the more traditional fixed feature spaces such as the classroom, the gym or the school yard.

The development of the urban school during the nineteenth century

*Lighthouses, my boy! Beacons of the future!
Capsules, with hundreds of bright little seeds in each,
out of which will spring the wiser, better England of
the future.*⁴

Sherlock Holmes' view of the (then) new London Board Schools, looming up above the London skyline like 'beacons' of hope for a bright new future, is a recurrent theme. This metaphor interprets education as a radical and evolving social phenomenon which requires the vision of a strong light shining and illuminating the way forward but also reflecting back to maintain the best of what has gone before. This enlightened view was reinforced by a concern for many aspects of the internal environment prescribed for these new buildings, which set the tone for elementary education in Britain during the early years of the twentieth century.

England had been the first country to experience industrialization and sought educational provision for the so-called industrial classes from the beginning of the nineteenth century. However, the early facilities were patchy, comprising church or factory schools paid for by subscription. Nevertheless, radical educators such as Johan Pestalozzi in Switzerland, Samuel Wilderspin in England and Friedrich Froebel in Germany, developed progressive theories regarding the education of poor



Figure 1.7
This Board School of 1910 has larger and smaller entrance doors for infants and juniors. (Photo: © Mark Dudek.)

children. These were concerned not just with spiritual well-being of children, but were also a response to the insanitary, overcrowded cities where children were often forced to work in factories from a young age.

From the implementation of the 1833 Factory Act, which enforced two hours instruction daily on factory children, reform developed as an all-too-evident response to the plight of the exploited masses. However, the level of government grants allocated to erect school houses in Great Britain seems paltry when compared with similar developments in other European countries at that time. For example, the Irish government provided a £2.5 million subsidy to assist education in Ireland between 1821 and 1828. It was not until the implementation of the UK Elementary Education Act in 1870 that similar sums were invested in England. The Act made education compulsory for all children between the ages of 6 and 11, so that the need to construct large schools within the urban areas became an overriding necessity. At this time, the London School Board advertised for an architect and surveyor to direct the massive expansion anticipated throughout the mainly working class areas of the capital. It was their great fortune that they appointed to the position the then architect surveyor to the Liverpool Corporation, E.R. Robson.

Whilst school systems in some shape or form had been developing throughout the world from the earliest part of the enlightenment, there was no coherent idea as to the educational needs of teachers and the school environment. The schools were usually part of church or commercial institutions. Spaces for education, whilst necessary, were

seen as being secondary to the delivery of 'instruction', which tended to concentrate on discipline and correct moral teaching as exemplified by Dr Thomas Arnold, a headmaster at Rugby School during the nineteenth century: '... what we must look for here is first religious and moral principles, second gentlemanly conduct, thirdly intellectual ability.'

Nevertheless, the first half of the nineteenth century had seen the publication of a number of treatises purporting to be about the design of schools. These were written either from a purely architectural perspective (with an emphasis upon the external style of the building), or from an educational point of view *per se*. Most notable of these was *Designs for Schools and School Houses*, published in 1847 by Henry Kendall, which urged the use of the gothic style, with little or no reference to the interior function of the building.

On the other hand, *School Architecture*, published by Henry Barnard a year later, was mainly concerned with the pragmatic health and safety needs of the children during their time in school. As Secretary of the Board of Commissioners of Common Schools in Connecticut, his concern was almost solely educational: '... so that his book, like many manuals of the time, was little concerned with the external architectural style chosen for schools. Kendall and [others] were architects but not educationists and showed themselves only marginally concerned with matters of internal school organization. Robson's great achievement was to make himself proficient in both the architectural and educational aspects of school design and to integrate the two ...'⁵



Figure 1.8
Design for a school in the
Early English style by
H.E. Kendall, 1847, a
form which became
typical for many English
village schools built at the
time. (*The English
School, 1370–1870*,
Malcolm Seaborne.)

The new Education Act assumed that the existing voluntary schools had sufficient resources to provide education to the required standard. This was often not the case, since most of them did not have prerequisite separate classrooms. Rather, they were comprised of single-volume spaces for the instruction of the whole school simultaneously. Nevertheless, the new state schools would be regulated by school boards and funded in areas of extreme poverty where gaps in provision needed to be filled. The gaps proved to be greater than anticipated, providing architectural opportunities for Robson and his contemporaries over the next thirty years.

Robson had travelled widely following his appointment in 1872. His view of overseas systems, particularly those he viewed in the USA, Switzerland and Germany, led him to the conclusion that although there was a tradition of secondary school education in these countries, upon which England could draw, there was no such tradition in elementary schooling. Ironically, the elementary schools designed by Robson hardly related to the smaller scale and magnified perceptions of most infants, many of the buildings later having been readily transformed into colleges of higher education. Nevertheless, observing the best systems of education the world had to offer proved to be a valuable experience in balancing his professional background in architecture.

His theories were set out in a book published in 1874 called *School Architecture: Practical Remarks on the Planning, Designing, Building and Furnishing of School*

Houses. The book was in reality something of an eclectic mix including chapters on the layout of schools, the planning of classrooms, the interior environment, 'warming and ventilation', school furniture and architectural style. Robson's ideas were widely implemented in London and subsequently adopted by other metropolitan boroughs throughout the country, largely as a result of this influential publication. These austere buildings were to have a profound effect not just on the educational aspirations of subsequent generations but also on the way in which those inner city communities evolved socially.

Views on the classroom set out in *School Architecture* were important in their practical response to the health concerns for the poor working classes. The children were to be kept well ventilated in lofty spaces proportionately relating plan width to height. Robson stated that the lighting of classrooms was all-important. Direct sunshine should never be from the south or south-west, although some sunny windows may be provided. He concluded that the coolest steady light was from the north and recommended that there should be a minimum of 30 square inches of glass to every square foot of floor space. This he asserted had been partly based upon previously unpublished German research. The tone of this publication had a reassuringly scientific clarity for other school designers of the time: '... in this sunless climate of ours it is difficult to make a school room too sunny; yet this may be done if the sun be admitted at the wrong places, as, for instance, right in the eyes either of teacher or children, and without most absolute power of control.'⁶

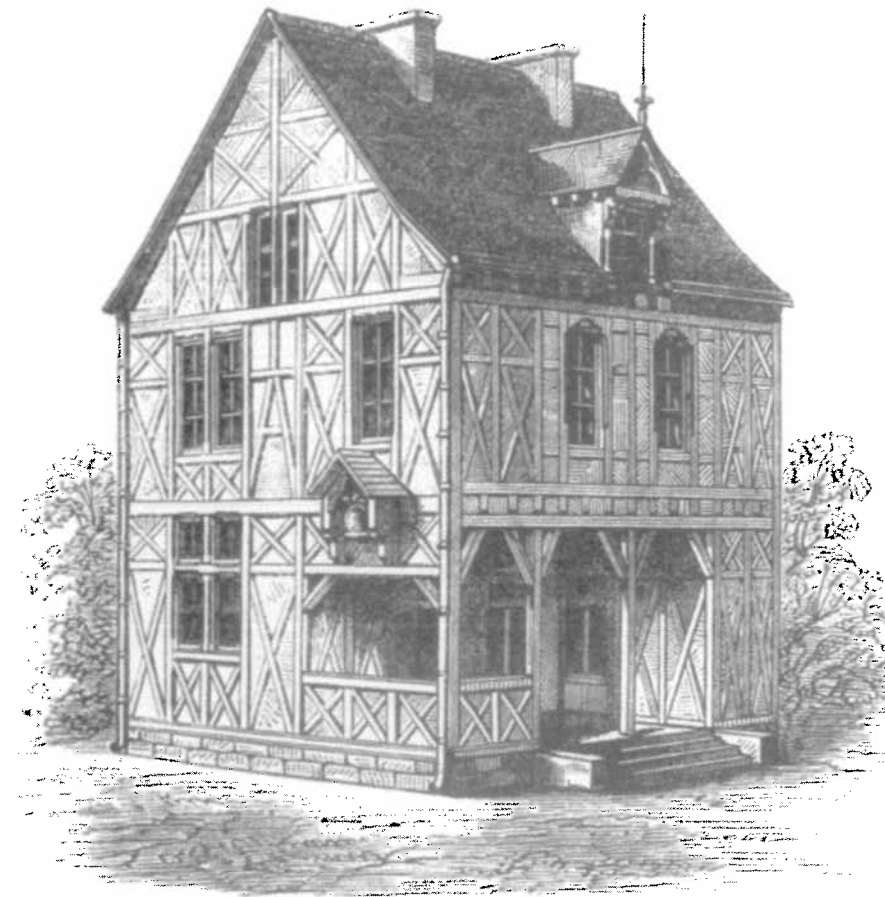


Figure 1.9
French rural school at
Saint Pardoux Les Cars
where a small population
is serviced in this
decorative timber
pavilion. (*School
Architecture*, E.R.
Robson.)

The overall shape of these new schools was largely determined on the basis of two key criteria: firstly the layout of the classrooms and secondly the number of pupils to be accommodated. Robson introduced the Prussian system of separate classrooms organized around a communal hall. Previously, lessons had taken place within vast communal halls. For example, the plan of the Southwark Central School of 1816 showed benches in rows with children sitting side-by-side in lines of 16, eighteen rows deep. Robson felt this to be too inflexible and arranged the classrooms to accommodate five rows of double desks ranged from front to back, a dimension of approximately 11 feet, (rather unscientifically) determined it seems by the distance a teacher's voice would carry. The desks had enough circulation space for the master to inspect the academic progress of each child. Crucially the arrangement allowed each child to leave their desk during the lesson. The classrooms would also include a generous area at the front for display, presentation and general circulation.

The second criterion established class sizes on the basis of a predetermined schedule of accommodation, with an

optimum number of 40–60 pupils in each. This was based upon the numbers which could be comfortably serviced by a single school master. The recommended format for these board or elementary schools was an infant department of 400 children and a junior department with separate boys and girls sections comprising 320 pupils in each. Generous circulation, latrines and the school keeper's house were crucial aspects of the programme. Thus a recommended size of 80 cubic feet per child was prescribed.

The style of these buildings is often described as 'Queen Anne'. They are mainly constructed of light yellow London stock brick with red brick dressings. Robson and his assistants avoided fashionable terracotta details, utilizing instead a little external ornamentation of carved title panels over entrance gates usually cut into the brickwork. The buildings were functionally rather than stylistically determined, with Robson's analysis of use patterns and efficient circulation largely setting the form. Although the contexts for many of Robson's schools were confined urban ones, the building was effectively an object, the form being largely dictated by functions of size (the schools were often three or four storeys high in order to accommodate

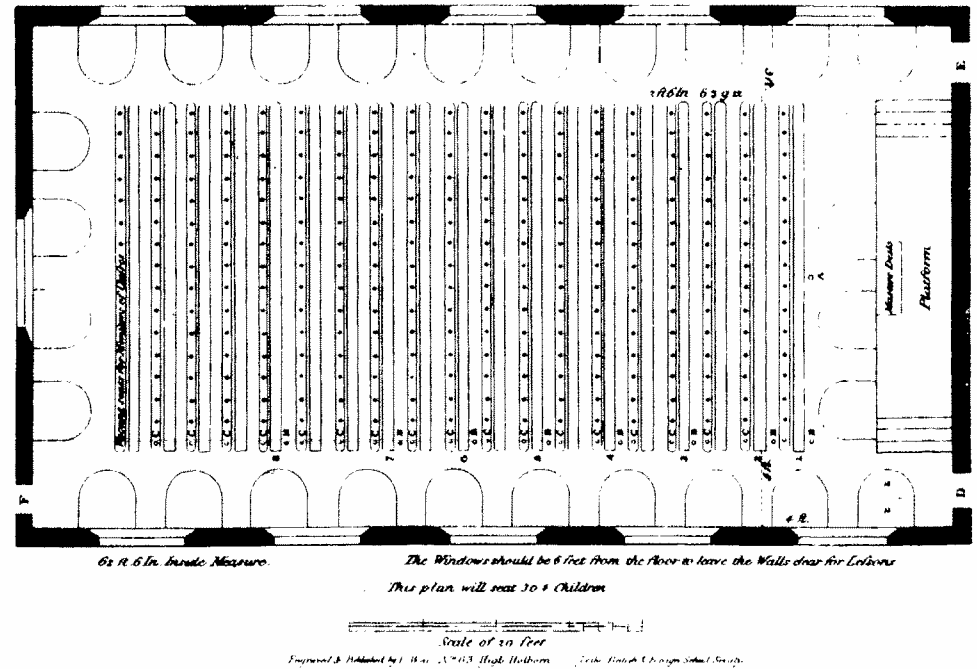


Figure 1.10
Plan of a British school for 304 children. (*The English School, 1370–1870*, Malcolm Seaborne.)
The inscription suggests that views outside would be restricted with windows starting six feet above the ground.

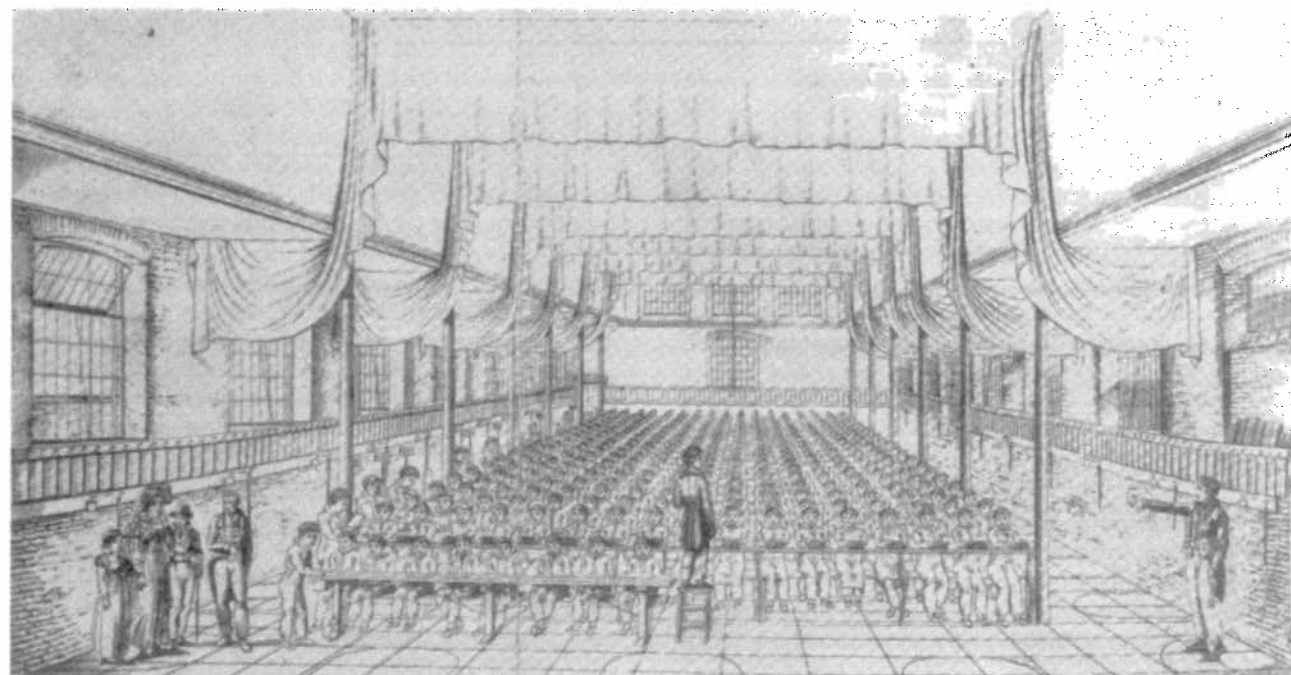


Figure 1.11
A class at Southwark Central School, early nineteenth century, with drapes introduced to soften and break up the large volume. (*The English School, 1370–1870*, Malcolm Seaborne.)

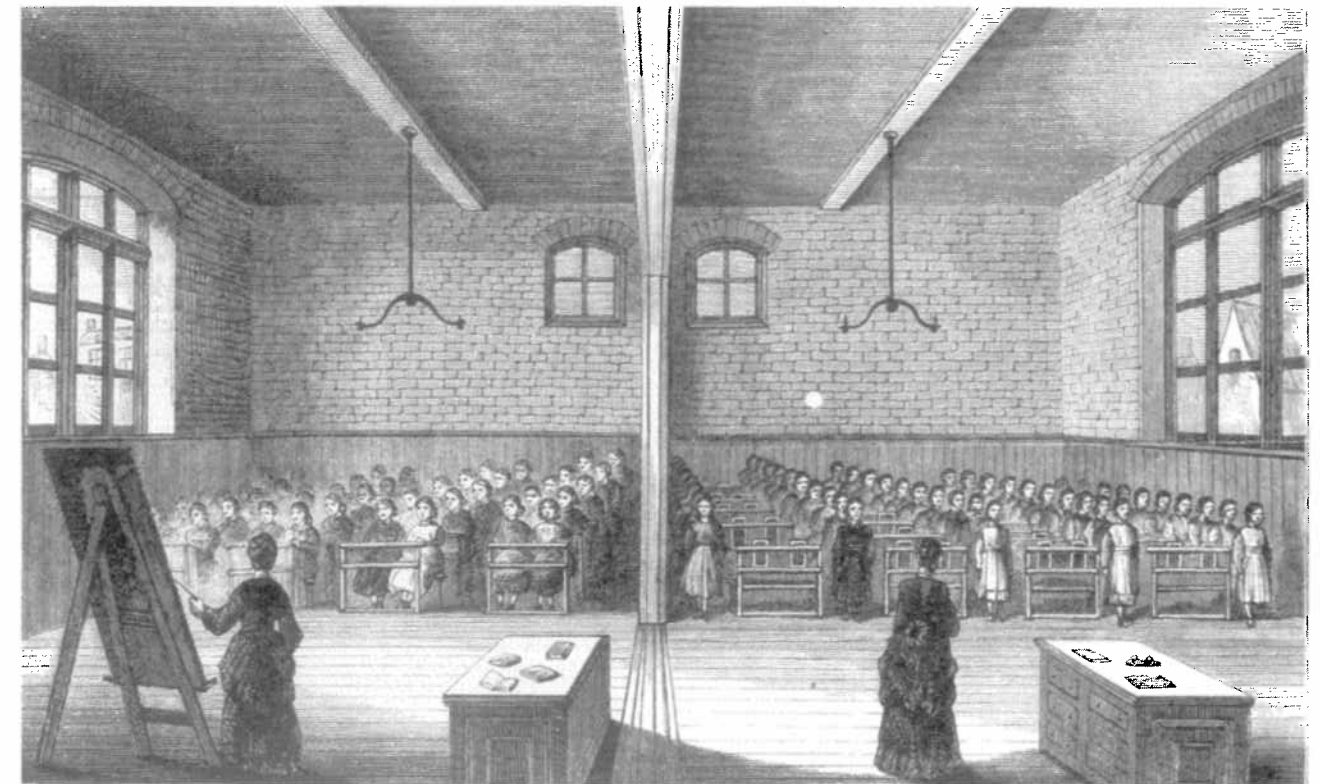


Figure 1.12
Robson's ideal can be seen in this early classroom layout with two desks for each teacher and a dividing curtain, a configuration reminiscent of more recent paired classroom arrangements. (*School Architecture*, E.R. Robson.)

all the local children onto a single site), orientation, and the designer's predilection for romantic variegated skylines; thus pitched roofs with gable ends, and by structural necessity, heavily buttressed brick walls with a prodigious number of chimney stacks established a 'recognizable architectural vocabulary, if not a coherent style.

As a consequence of these site exigencies, the external areas were often problematic. They were secondary to the constructional economics of the buildings themselves, leaving tight overshadowed pockets of 'play' space sandwiched between the high school walls and the boundary walls to the street. Within these bleak overshadowed conditions the children were expected to spend their play-periods. The needs of society were exemplified by the scale of the provision. The uniformity of the environment was reminiscent of the factory floor, where most of the incumbents were destined to end up. Nevertheless, the buildings were robust (many being still in use today) with an environmental strategy which to some degree countered the unsanitary London slum conditions. The schools became a symbol of enlightened progress which combined some aspects of the eighteenth century manor

house layout with a reassuringly sturdy fortified image. Most importantly, Robson was the first designer to marry educational theory to architectural practice in any meaningful way.

Meanwhile, developments in Scotland, particularly in infant education, had been advancing slightly ahead of England. Robert Owen had established his first model infant school at his New Lanark industrial community in 1816 and David Stow founded the Glasgow Infant School Society in 1827, and in 1828 its first school. The single-storey building focused much of its activity on the garden: '... the uncovered schoolroom ... a little world of real life where mental, moral and physical character are best developed and consequently where moral habits can best be formed.'⁷ However, the children were not permitted to touch the fruit on the trees. Stow interpreted this as a vital act of self-discipline within the vice-laden world of the industrial city. Indeed, the flowers and shrubs in the garden were viewed as the antithesis to the cramped environment of the Glasgow tenements, a symbolic assertion of innocence, an invocation of the mythical Garden of Eden prior to the fall from grace.

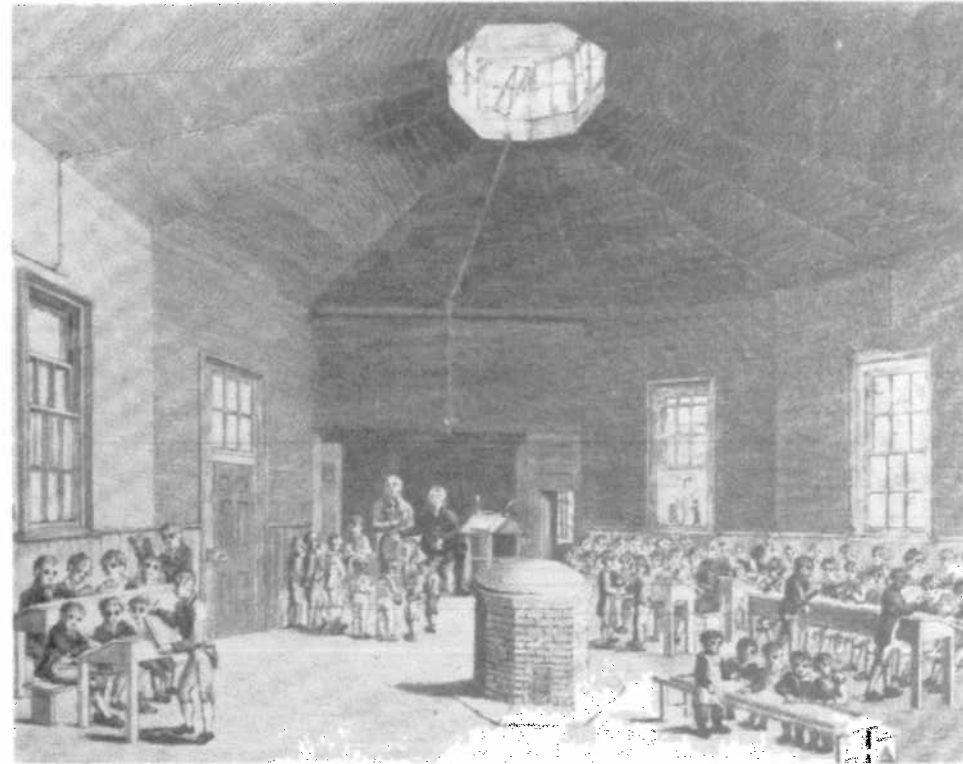


Figure 1.13
Stow's model infant school interior, 1836; the arrangement was quickly superseded as the UK school population rose by individual classrooms for age- or ability-related children. (*School Architecture*, E.R. Robson.)

Stow was involved with the founding of the Glasgow Education Society in 1834, and subsequently oversaw the construction of a seminary for teacher training purposes. It had four model schools: an infants, a junior, a commercial school for fee-paying boys and a female school of industry. The key to the teacher training programme was, according to Thomas Markus, that of control. As a consequence, the space within which the ritual was enacted was precise and focused towards that end: '... everything is designed for surveillance ...'.⁸ The school was housed in a single volume where the master taught simultaneously to all ages; there was a gallery which had to be large enough to accommodate the whole school so that all the children received the same message. For writing, the children sat at desks around the edge of the school room, facing the wall.

Within a period of thirty years, Stow's negative view of the city had evolved into school organizations which reflected a more sophisticated approach. Robson's archetypal plan for the Jonson Street Board School in Stepney of 1873 shows eight classrooms organized around a central hall. Although the hall was still used by the master or headteacher for rotating class groups and whole-school assembly, the classrooms, which were accessed off the hall, were intended for a single teacher working in isolation. There were windows for observation from the hall to the classrooms; however, the (head) master was no longer the sole source of instruction. Not only would it

have been impossible logistically for the simultaneous system to continue, it was pedagogically inappropriate. The newly trained teachers had their own vocational message to add to the standard curriculum which provided a varied and therefore more balanced education for children moving through the school system.

In 1872 an Education Act was passed in Scotland requiring a school board to be established in each district. The committees were given statutory legislation to supervise the building of schools and to provide an acceptable standard of education for all of their children from the age of 5 to 13. Many of the new schools were designed on the principles set out in Robson's book. In 1895, Charles Rennie Mackintosh, the emerging star of the Scottish Arts and Crafts Movement, designed his first school, the Martyr's Public School in Parson Street, Glasgow. The Martyr's had a formal plan very much in the Robson style with tall staircase windows, three storeys of accommodation, and the usual separate entrances for girls and boys. Each floor included two master's rooms.

The form was a Scottish vernacular stretched and adapted to fit its institutional function and its slightly inappropriate site. The style reflects Mackintosh's deeply absorbing study of old Scottish baronial buildings. Although of a higher architectural order, the scale of the building fitted in with the surrounding urban grain of Glasgow tenement blocks, in contrast to the overpowering

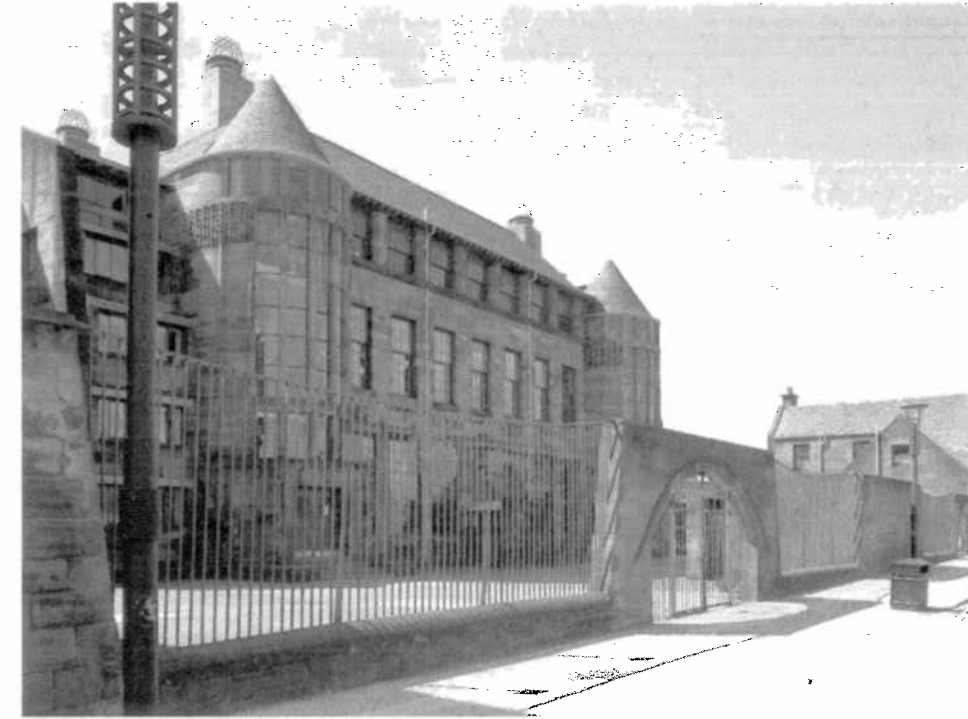


Figure 1.14a
Scotland Street School. (Photo: © Eric Thorburn.)

effect most of Robson's schools had on their surroundings. The hall, which was annotated as a 'Drill Hall', was surrounded by four classrooms and two staircases. There was no lift and the staff and pupils may have spent much of their time between lessons running up and down the staircases. Although the plan was compact, the building feels too tall for its site and purpose.

In 1902, Mackintosh was asked to design a board school in Scotland Street. Although the programme of accommodation had generally been settled by 1903, the building was not completed until 1906. Cost limitations and the Scottish School Board's fixed ideas about its design emanating from Robson's *School Architecture* caused disagreements and delays. By this stage of his career, however, Mackintosh was an independent practitioner with a growing reputation. After much argument the architect got his own way and succeeded in increasing the budget. This enabled the inclusion of crucial spatial and decorative additions which were intended to raise the architectural quality above that of the typical Robson board school.

The three-storey building was constructed of red sandstone with a plan which was based on the standard Glasgow School Board type. It had mirrored entrances with separate staircases for boys and girls. The staircases were articulated as semi-circular towers, with flat protruding entrance porches at ground floor. There was an assembly hall at the centre of the plan, one side of an enclosed corridor running down the middle. There were six classrooms and attached staff/cloakrooms. Above the hall at

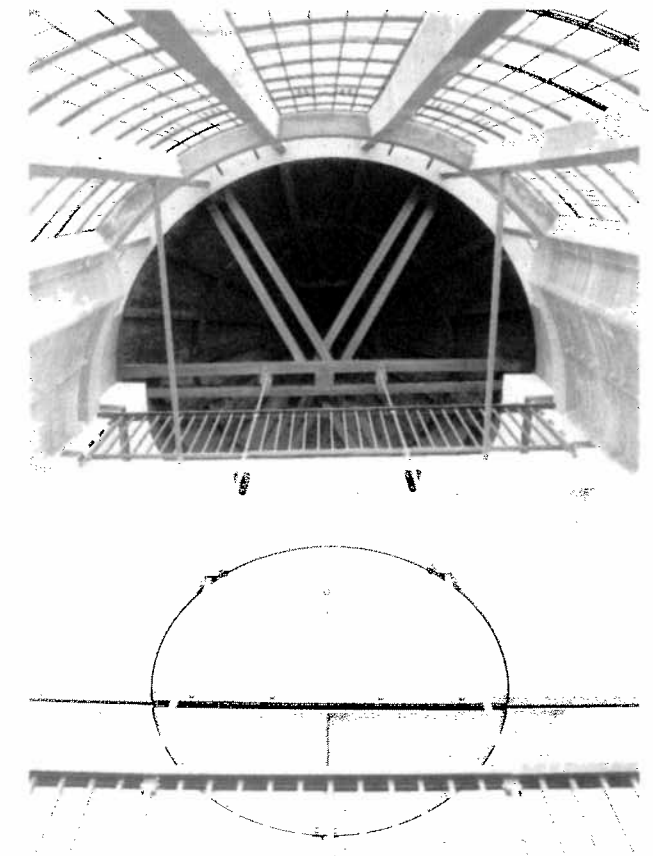


Figure 1.14b
The interior stairwell, looking up. (Photo: © Eric Thorburn.)

first floor there were a further three classrooms, and at second floor, six south-facing classrooms with a north-facing cookery/demonstration room. In total the building had 21 classrooms designed to accommodate 1250 children.

Decorative detail was limited to door and window surrounds. However, the effect of the powerful abstracted organic forms, which appeared on the upper stair towers, combined with the light airy quality of the staircases and other circulation areas, elevated its spatial ambience above the austerity of Robson's proto-functionalism. Robert Macleoud observed: 'Perhaps not surprisingly, in trying to exploit what Mackintosh called "the spirit of the old" without slavishly emulating its details, he produced a building with "the spirit of the new".'⁹

The elegant spatial ambience of the interiors illustrated the manner in which good architectural design could raise the quality of the educational experience. Mackintosh achieved a masterly relationship of the elements translated into a building form which in plan terms was similar to the London Board Schools, but a million miles away architecturally. For example, the proportions and forms of the windows largely respond to the internal functions, making the building's various rooms and spaces legible from the street. With its refined symmetry and articulate façade treatment, Scotland Street School heralded the beginnings of an architectural typology, the urban school. To some extent this straddled the educational attitudes of the nineteenth and twentieth centuries, maintaining some of the worthwhile traditions of the past whilst looking forward towards more advanced spatial relationships.

John Dewey and the Frank Lloyd Wright connection

In the years immediately following the establishment of a widespread compulsory education system throughout Europe and North America, a number of key educators emerged who influenced the architecture of schools in a profound way. For example, Margaret MacMillan in London who addressed the needs of the working poor and Maria Montessori in Rome who pioneered the first apparatus scaled to the size of young children, amongst other innovations. The effects of the First World War, as well as depleting the teaching profession, caused a hiatus in the ongoing development of mass education. Many school buildings were requisitioned by the military. After the carnage of the trenches, an understandable wish to look forward rather than backwards prevailed, which heralded modernist movements in the arts generally and education in particular.

In Britain, there was a realization that the understanding and knowledge of ordinary German soldiers in the trenches had been greater than their British counterparts,

especially in relation to science subjects. A further concern had been the recognition that many of the revolutionary cadres of the Russian Revolution of 1917 had been led by teachers. The new post-war president of the board of education, H.A.L. Fisher, former vice-chancellor of Sheffield University, sought to pay additional grants to serving teachers and where possible to give them what they wanted in the form of buildings and equipment. However, as a result of the obliteration of a generation of men, more and more women entered the profession.

Many conservative educationalists were unhappy about this development, believing that boys should be taught by men. Indeed, they believed that education was primarily to service the needs of industry and was more important for male children anyway. However, after the loss of so many, there was really no alternative and they were powerless to stem the feminist influx. This supplanting of the master with the school mistress was a universal phenomenon which carried the new spirit in education further and more quickly than would have occurred with an exclusively male-dominated profession. Many believe that it promoted a deeper, more questioning, approach to teaching and the environments within which it should take place. Novice teachers now looked for radical new approaches. At the same time, new generations of architects were turning their backs on the stylistic concerns of the nineteenth century, in search of a more meaningful social role for themselves, through their work.

John Dewey (1859–1952), who had influenced those schools designed by Frank Lloyd Wright between 1900 and 1908, had a particular approach to education. It captured the imagination of this new generation of educators during the immediate post-war years. Although the schools designed by Wright were not for mass education – rather 'one offs' commissioned for middle class children – nevertheless they became paradigms in the history of school architecture and in the wider work of the great man. They encompassed a more advanced approach to education than Robson's. Most importantly, they incorporated many of Dewey's radical educational ideas, in new architectural forms of real sophistication.

Born in 1859, Dewey taught philosophy at a number of North American universities before settling at Chicago University where as director of the school of education he remained from 1894 to 1904. During this time Dewey established an experimental school which explored new ways of teaching. He came to formulate democratic (as opposed to autocratic) principles and occupational hands-on instruction which revolutionized educational practice in the USA, Europe and Asia for the next thirty or so years. The primary focus was the desire to create schools which were cooperative communities helping individual pupils to fulfil their true potential. He recognized the importance of stimulating children's senses as part of the educative process: '... *The boy flying a kite has to keep his eye on the*

kite, and has to note the various pressures of the string on his hand. His senses are avenues of knowledge not because external facts are 'conveyed' to the brain, but because they are used in doing something with a purpose.'¹⁰

Robson and his precursors were largely concerned with the educative process as one of control, where the school environment was relatively autonomous and closed to the outside world. Dewey promoted a more open approach, seeking to replicate the ordered diversity of the real world, through an enriched educational curriculum. Administration within the school community, the selection of subject matter, methods of learning, teaching and discipline, reinforced the idea that there was one reality rather than a duality between school and home life. Writing in *School and Society*, published in 1899, he stated: '... [we must] make each one of our schools an embryonic community life, active with types of occupations that reflect the life of the larger society, and permeated throughout with the spirit of art, history and science.'¹¹

The accommodation of these experimental schools would henceforth not just include classrooms, but also laboratories, workshops, a gymnasium and drawing studios to furnish the pupils with broader more questioning skills.

His strongly held views on architecture showed the important relationship which he felt existed between the two disciplines. From the outset, Dewey equated the dated educational methods of the nineteenth century to a similar spirit in architecture of that period, with its stylistic as opposed to social concerns. It was, he believed, an approach which was overly academic and therefore irrelevant to the needs of everyday life. Just as the single controlling message of the early nineteenth century educators was largely obsolete, so too was its architecture, with its similar hectoring stylistic obsessions. The use of history and tradition in itself was not a problem, but '... *the latter have not entered into his [the architect's] mind; into the structure of his own ways of seeing and making. They remain upon the surface as tricks of technique or as extraneous suggestions and conventions as to the proper thing to do.*'¹²

This philosophy initially reflected the authentic spirit of the new pluralistic architecture exemplified by the work of Frank Lloyd Wright and C.R. Mackintosh during the early years of the twentieth century. Good planning and sound construction were graced with a genuine concern for visual delight and variety exemplified by Arts and Crafts embellishments. During the post-First World War years, Dewey's brand of philosophical pragmatism, including practical as well as academic learning together in the same educational package, quickly infiltrated architecture. This lasted for twenty years until, in the spirit of the machine aesthetic, such visual enrichment became suspect. Nevertheless, he continued to assert the importance of architecture, drawing subtle analogies between educational practice and architectural theory.

He recognized the chasm opening up between the modern practice of architecture which was as he understood it, new and authentic, and the ideas of the past. In his view, the theoretical tricks of the academic architect created a pompous, largely irrelevant form. The best new architecture carried in it a quality which brought it closer to nature than any other artistic medium such as painting, sculpture or poetry: '... *Compare buildings with other artistic products and you are at once struck by the indefinitely wide range of materials it adopts to its ends – wood, stone, steel, cement, burnt clay, glass, rushes, cement, as compared with the relatively restricted number of materials available in painting, sculpture, poetry. But equally important is the fact that it takes these materials, so to speak, neat. It employs materials not only on a grand scale but at first hand – not that steel and bricks are furnished directly by nature but that they are closer to nature than are pigments and musical instruments.*'¹³

Dewey hoped to bring about a similar transformation in the way children were educated, making it more various and natural. Buildings for the new education were to have complementary qualities. Frank Lloyd Wright almost certainly picked-up on this philosophy, mixing as he did with the major figures of Chicago's intellectual life. In 1887, when he was only 18, Wright had designed the first building for Hillside Home School at Spring Green, Wisconsin. This had been for his maiden aunts, Jane and Nell Lloyd-Jones. The manner of the building was shingle in style with roofs and gables of a picturesque, vernacular form reflecting the Queen Ann revival emanating from England. By 1900, having been much altered, the buildings had become outmoded spatially.

In 1902 Wright gained a second commission, for a group of buildings for Hillside Home School. This was the first major building he designed independently and the precursor to his masterpiece, Taliesin North. It was constructed of local sandstone formed in rough ashlar blocks. Architectural critic Grant Manson suggests that the rugged effect of the architecture, which came about through an integrated approach to structure, materials and landscape, reflected the client Lloyd Jones' own earnest hard-working spirit. In his view, the strength and primitive lines of Hillside Home School 2 responded to the crags and gorges of the Wisconsin River Valley. This is much more appropriate than the shingle style of the first school. Manson asserts that the second school building has a simple majesty more emphatic than that of its Illinois prairie setting. However, it is more appropriate because it competes and contrasts with the bluffs and ravines of the Wisconsin Valley.

The plan of Hillside Home School 2 is based on a brief from Wright's client which in turn was almost certainly influenced by the ideas of John Dewey. This is evidenced in the provision of classrooms served by a gallery with manual training below, a gymnasium at one end and an



Figure 1.15
Hillside Home School, designed by Frank Lloyd Wright. (© Kenneth Macdonald.)

assembly hall at the other. The school entrance was adjacent to the assembly hall, which was linked to the science laboratory and the drawing studio by a bridge. The pragmatism of John Dewey's thinking is demonstrated in this layout with its deterministic allocation of spaces each for a particular range of vocational skills. The bridge link suggests a more tentative connection between traditional and new curriculum activities.

Horizontality is emphasized by roofs and the mullioned screen windows fixed in the vertical with oversized chimneys. Internally the building was an exploration of complex volumetrics. There was a sophisticated modulation of daylight, with walls which no longer appeared to enclose space in a conventional manner. Screens and other flexible elements largely replaced fixed solid walls. The whole building appeared to be 'spread' across an undulating landscape. Changes in profile externally and stepped floor levels internally added variety, the latter putting into question contemporary thinking that schools should all be on a single uniform level. It can be argued that the spatial awareness of able-bodied children is heightened by this effect. The various forms are complemented with flattened overhanging hipped roofs which are neatly coordinated and bring about a real sense of unity to disparate parts of the plan.

The Prairie House formula applied Dewey's views on flexible multi-functional spaces and harmony with the natural environment for the first time. It demonstrated the suitability of such thinking in education and, in 1902, was widely recognized as the most advanced school form of its type. Built at a time when most school design was essentially based on historicism, Wright's interpretation of the Dewey philosophy illustrated a flowering of architecture for schools in its integration of two radical new philosophies, one educational, the other spatial. Subsequently it was much copied, but never with such architectural dexterity.

It was only thirty years after Robson's first schools opened, but light years away in terms of advanced school design. It could be said that like Robson forty years previously, Wright, with the aid of Dewey's prompting, had invented a new form of school architecture: one which was not confined to a restricted urban site. Rather, it opened itself up to the surrounding green spaces illustrating the positive benefits of rural settings or what in later years might be characterized as suburban. The classroom vista was no longer restricted by high window sills with children stiffly focused on the teacher sitting on a raised dais. Instead they were encouraged to use the surrounding context as a catalyst to creative thought and activity, all on

the same physical and social level as the teacher. Furthermore, the architecture developed in response to its setting, which was used to complement and inspire its design.

Susan Isaacs and the Free Schools

Immediately after the First World War, translations of Freud's writings on psychoanalysis were published for the first time in England and North America. A little later Percy Nunn, professor of education at the University of London, produced the influential *Education: Its Data and First Principles* (1920) which dealt with natural selection and the physical inheritance of the child. As a liberal idealist, Nunn believed in enabling '... each child to realize his potential more completely and he called upon knowledge of human psychology and educational practice for this purpose.'¹⁴ Educational theory picked up on the ideas of Dewey, Bergson, Freud, Jung and Adler, distilling concepts which emphasized the importance of freedom rather than restraint, stressing the primacy of the emotions over and above the intellect. A truly radical spirit of experimentation was transforming the thinking of key educationalists, which would be disseminated into some mainstream practice, within the space of thirty years. Perhaps most importantly, the functioning and processes of the unconscious mind were promoted as having a significant effect on development and well-being, the educational significance of which was keenly felt within these circles.

In 1924, inspired by the writing of Dewey and enthused with this new radical spirit, Susan Isaacs became the principal of the Malting House School and developed her own educational philosophy. This focused on the natural environment, encouraging freedom of expression and a spirit of communality. She allowed, even encouraged, children to behave in free and unrestrained ways, which contradicted much traditional thinking on education. She recognized the radical nature of the Montessori system, which challenged children in their learning. The importance of sensory material to promote understanding was also stressed, as well as the benefits of group and social interaction. The school was an attempt to recreate the 'embryonic community' in its formulation of scaled-down adult activities. This was very much in the mould of Dewey, but applied in a more radical context, the free school as a laboratory of new educational practices.

Children of university-educated parents, with a high level of mental capacity, comprised the majority of the pupil intake throughout the three-year life of the project. The Malting House School, which initially opened with 10 boys, had expanded to a maximum of 20 boys and girls aged 2.8 to 10 years of age by its second year. In the first year it was a day school only, and in the second year

weekly boarders became part of the intake. By the end of Susan Isaacs' reign, one-third of the pupils were accommodated as boarders in two converted houses annexed to the main school. Observation of their activities was to provide data for research, which produced the influential publications *Intellectual Growth in Young Children* (1930) and *Social Development in Young Children* (1933), both written by Susan Isaacs.

Each child had his or her own brightly painted bed sitting room scaled to an appropriate size, with a lock on the door to encourage a sense of independence. As part of the educational curriculum, the children were encouraged to cook, bake and make drinks, using the facilities provided. Furniture was made to the scale of the children, echoing the principles of Maria Montessori. Beneath the observation gallery within the hall, climbing bars and swings provided for indoor physical activity. This was the first such apparatus and a radical transformation from the disciplinarian 'drill halls' of the late nineteenth century schools. The gallery itself was strategically positioned to facilitate discreet viewing by numerous visiting academics engaged in research. There was direct access to a large garden with sandpits, water pools and the first 'jungle gym'. Beyond were trees and wilder shrubbery which provided the opportunity for children to lose themselves.

A complete kit of tools, including saws for wood cutting, were provided as well as more conventional building blocks and craft equipment. The use of practical teaching methods, such as animal dissection, prefaced the introduction of a science curriculum in secondary schools. Mary Field, who made a film about the school's activities, recounted this story of her first visit for filming purposes: '... the children were dissecting Susan Isaacs' cat which had just died, when normally they worked with frogs or dogfish. They all seemed to be enjoying themselves immensely, digging away at the carcass ... Then there was the bonfire. It was supposed to be an exercise in free play, but it got a bit out of hand. The fire spread and spread and reached the apple trees, and then destroyed a very nice boat. Even Geoffrey Pyke was a little upset about that, and he seemed a very calm man.'¹⁵

Unfortunately the film made by Field has been lost. However, we can surmise that the school buildings themselves were unremarkable, comprising of a malting house barn converted for the use of the children, two existing houses and a large garden. Since there were a maximum of twenty boys and girls, only one or two dedicated teaching spaces were required. However, the curriculum was to have a profound effect. The children were encouraged to be curious about everything, and there was no formal class teaching and no fixed lessons. The permissive informality of the Malting House routine was prescribed by Dewey, whilst experimentation in teaching techniques was inherited from Montessori and others. Freud brought the most shocking of the innovations in his

perceptions on infantile sexuality. Isaacs was anxious to study the less attractive aspects of children's behaviour as well as the more acceptable areas, and there were few behavioural taboos.

Evelyn Lawrence started teaching at the Malting House School in 1926 and commented on the uninhibited crudity, savagery and sexual interest displayed by the children, obviously with some concern. She had doubts about the future manners and habits this approach would develop within the incumbents. According to Stewart, her worries were unfounded as later acquaintance showed that Malting House alumni generally possessed easy manners and deep social consciences. However, the school was not dealing with poor children. These were the children of the wealthy intelligentsia, and the highly educated parents reinforced the pedagogy at almost every level. Where such parental support was less understanding of the liberal ethos, such freedoms proved unworkable (see reference to the William Tyndale School in Chapter 3).

The influence of the Malting House School has been out of all proportion to its three-year life span and the limited numbers of pupils with which it dealt. The Russells, Susan Isaacs, Curry and Rudolph Steiner were concerned about a form of education which went beyond the enabling ladders of achievement, lessons being learnt and examinations being successfully passed. Their experimental spirit exemplified by this, the first free school, was akin to those prevalent within the fields of art and architecture. Much of this utopian thinking was to be put to the test in the years leading up to, and following, the Second World War, with the construction of dramatic new school buildings which paid scant regard to the architectural forms of the past. Due to the 'found' nature of its buildings, the environment of the Malting House School was never believed to be of great significance. Its lack of an overt architectural stance was a weakness which was not addressed by Isaacs. She said nothing in her books about architecture and the environment. However, with its focus on child-friendly details and equipment, and its open aspect to the garden, its environment was a vital element of the educational process and an early example of architecture for childhood. The quest to de-institutionalize the institution had reached its nadir.

In a similar spirit to the Malting House School, an experimental educational community was established in Dartington as part of a larger social and economic experiment. In 1931, Leonard and Dorothy Whitney-Elmhirst had established a trust for this purpose. They invested all the land, buildings and services both inside and outside the Devon estate which they owned. The principal aim of the Elmhirsts was to develop its natural resources, and this included the educational potential of the local people. The commercial enterprises owned by the Trust included farms, a textile mill, saw mills and 2000 acres of forest. These provided funds for the development of non-

commercial activities which included an art centre, an adult education centre, research projects, the general upkeep of the garden and grounds, and the establishment of an experimental school.

William Burnley Curry served the school from 1932 to 1957 as its first head and was pivotal in the development of new approaches to teaching during this time. He had first taught at Gresham School Holt and in 1922 went to Bedales where he taught physics until 1926. There he began to experiment with a radical new approach to education which encouraged the independence of the pupils within a traditional educational framework. In Curry's words: '*... a modern school is one which recognizes that the social order must be radically changed if civilization is to advance at all and which also recognizes that education will have perhaps the most difficult and the most important part to play in the changes which must come about.*'¹⁶

Curry went from Bedales to Oak Lane County Day School in Philadelphia, which had been founded in 1916 by a group of businessmen who wished to apply John Dewey's educational theories. Curry became head of school at Oak Lane in 1927, where he remained until in 1931 he became Director of Education at Dartington on the basis of his progressive educational ideas. These could be summarized firstly as an enhanced concern for individual children and their way of learning, secondly the need for pupil participation in school governance, thirdly a resistance to uninformed parents forcing their views of education upon teachers. Instead, parents and other adults should be friends to the pupils in their care. These three tenets became the somewhat unusual principles of education around which Dartington was founded.

Leopold Stokowski asked architect William Lescaze to design a nursery school for the Oak Lane County day school near Philadelphia. After Curry was appointed director of Dartington, he in turn asked Lescaze to design his house. The Trustees of Dartford were so impressed with High Cross that they commissioned him to design a series of projects including a gymnasium addition to the existing school and three boarding house/classroom block combinations. The Dartington Hall work which Lescaze undertook was influenced by his fascination with the Dessau Bauhaus. He designed three buildings for the lower school. Perhaps the most significant architectural loss in the history of twentieth century school architecture was the progressive school project, which would have encapsulated many tenets of the new educational theory in its rejection of past styles. By way of consolation, one might have predicted that the damp Devon weather would not have treated its light planar construction kindly.

The new spirit of functionalism was becoming more and more influential, particularly within modernist housing developments such as the Karl Marx Hof in Vienna. This massive municipal housing scheme was humanized by the incorporation of shops, clinics and, most importantly,

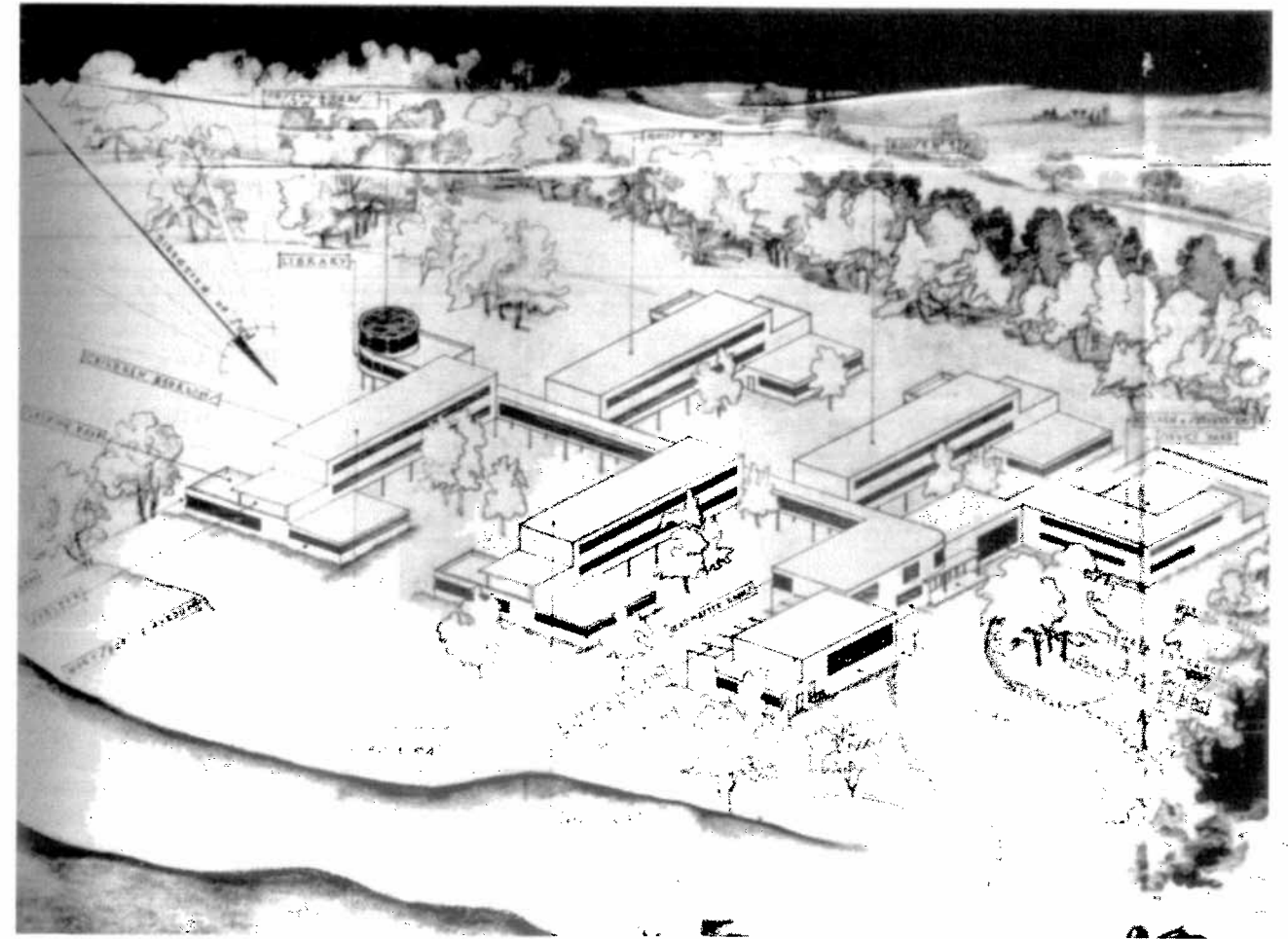


Figure 1.16

A progressive junior school proposed by Howe and Lescaze in 1931 but which was not built in this form because it was too expensive. (William Lescaze Catalogue 16, Rizzoli.)

schools, which created a distinctly European form of social housing. However, many education officers in England viewed this radicalism as being too politically extreme. The village school movement had emerged partly as an anti-European response to this radicalism. Amongst others, Raymond Unwin's conservative theories became highly influential. Unwin and his partner Barry Parker had strong ideas about social amelioration which influenced the wealthy Rowntree family. A site three miles outside York owned by the family was to become the village of New Earswick. This was in direct response to the appalling statistics of overcrowding and ill health identified by one of Joseph Rowntree's sons.

The new development was to include good economic housing, sound healthy education and recreation for its inhabitants. Built from 1910, schools, churches and shops were constructed around a large village green.

Everywhere, children's facilities were given a special emphasis. A paddling pool was included together with an open-air swimming pool next to the main school buildings. In addition to conventional schools, an open-air school was provided with large folding classroom windows and two open verandas on the East and West, to provide additional shaded teaching spaces. The plan of New Earswick was illustrated initially with only the streets and major institutions set out. Although something of an experiment, the development adopted a traditional architectural language, and provided a clear framework for the subsequent housing development.

Around the same time, Henry Morris, the newly installed Director of Education for Cambridgeshire, adopted a less circumspect view in community developments under his jurisdiction. He divided the county into nine areas, each with its own senior elementary school or college. The programme

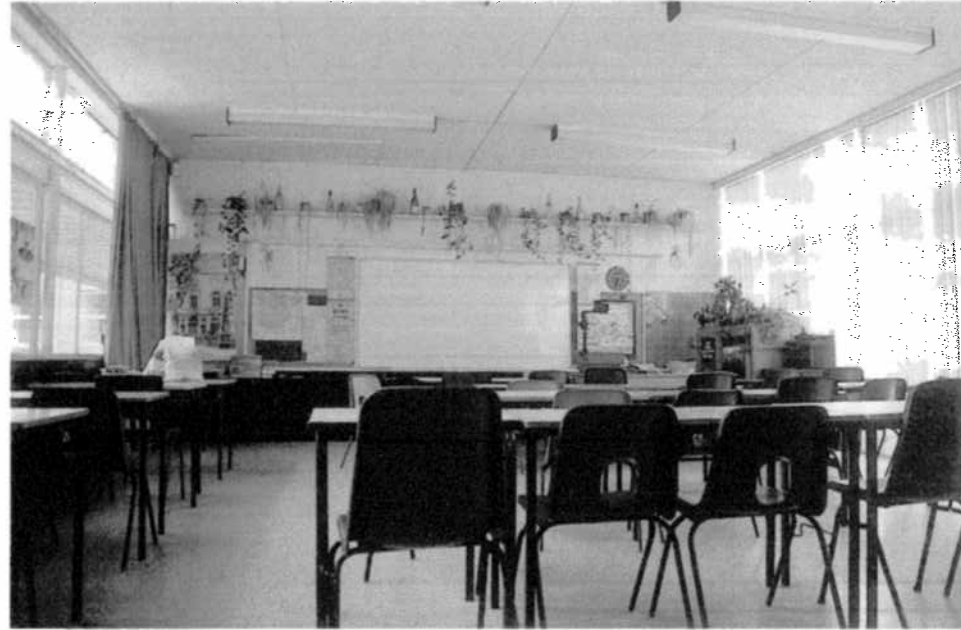


Figure 1.17
Walter Gropius with Max Fry, School and Community College at Impington, Cambridgeshire, double aspect classroom along the west courtyard. (Photo: © Mark Dudek.)

for these new schools would include a cultural centre for adults on the same site. The first college was opened in Sawston in 1930. It coordinated traditional and eighteenth century forms into a modern unified composition. S.E. Urwin, the architect for the second college at Bottisham and Luton, abandoned the neo-Georgian style in favour of a modernist approach. During the course of its construction, Morris met Walter Gropius and became excited by his architectural ideas and charismatic enthusiasm for the new architecture. He awarded the fourth college commission to Gropius working in partnership with Max Fry.

The first scheme was too costly and, much to Gropius' frustration, was modified. However, the building proved to be his finest work of the 1930s. During the day it worked extremely well as a primary school for 240 pupils, and later in the day and during the evenings, it doubled as a regional centre for adult education. The building was planned around a central promenade walkway, which provided an informal social focus, hosting school exhibitions and meetings; this important element of the design also acted as a spill-over area during intervals when evening concerts and plays were being performed in the school hall. The warden's office and staff rooms occupied one side of the promenade, children's entrances and changing rooms the other. The wing on the right of the assembly hall was used for adult education evening classes. The curriculum included courses in the arts and sciences, handicrafts, agricultural and physical training. This sophisticated functional mix was in perfect harmony with the architectural aesthetic, suggesting a progressive and enlightened view of education. It was much imitated by the school designers of the post-war years.

In the years prior to the First World War, the Ecole des Beaux Arts in Paris hosted a radical strain of committed staff and students which led to the emergence of international talents such as Tony Garnier and August Perret and his students Le Corbusier and Erno Goldfinger amongst others. Having won the Prix de Rome (1898), Garnier developed his ideas on urban planning away from Paris. In 1901 he returned with his first study of the Cité Industriel to the Ecole. In it he devised a plan for an ideal city based on mixed functions. Perhaps most significant were his plans for the residential areas, which had an advanced form of tertiary schooling, located close to the dwelling units.

Garnier adopted an undecorated form of architecture for these schools based on geometry and an unprepossessing 'hole in wall' aesthetic. Children were separated in terms of age and advancement in learning. The schools were coeducational, which was another significant advance. Primary schools were dedicated to children from the age of 6 to 14 years. Adjoining infant schools were provided for children from 2 to 4 and from 4 to 6 years. Although unbuilt, Garnier's plans had advanced features such as age-related classrooms and special streets landscaped as safe child-friendly gardens separating younger from older children – usually older and younger children would all play in the same schoolyard, whereas here they were given separate playgrounds so there was less bullying. They also incorporated covered and open play yards, dining facilities with kitchens, covered play areas, and assembly halls laid out with individual chairs and projection facilities. The primary schools were to have gymnasiums. His thinking on secondary schools included

compulsory attendance for all young people up to the age of 18 or 20. The education system was to be designed for the needs of an industrial city, which included administration and commercial vocations, and, for a small number, professional and artistic education. Those who were recognized as having an extraordinary talent would go to a special school for higher education elsewhere.

Unwin's school in New Earswick had been designed in a typical arts and crafts idiom, with sharp gables, half timbering and barn-like tiled roofs, where the visual character of old England was recalled. Between the wars, many new schools were designed to a similar conservative formula, incorporating retro arts and crafts embellishments. The Nazis in Germany responded in a similar way, rejecting any form of modernist references, clothing their new school buildings with ornate bavarian fachwerk dressings. For a time the garden city idea became a popular alternative to the traditional city, with more green open spaces and a comprehensive education system central to the planning.

Garnier's was a garden city idea, but conceived on a far larger scale than Unwin's 'folksy' village idiom. More importantly, it adopted a modern architectural form as opposed to a sentimental arts and crafts style. However, education and the role of children within the city were central to both developments. For Garnier, education commenced at the age of 2, and for the brightest children would continue up to the age of 20 years. These principles, along with the open-air philosophy, were helping to formulate a new architecture of schools which emerged and flourished.

Educating the architects – the post-war years

Education is the result of experience. The wider and more complex the experience, the deeper and more intense the education. The field of experience widens in direct relation to the frequency of contacts, and its complexity grows with the increase in their variety ... institutions limit both contacts and education.¹⁷

Accommodating new generations of schoolchildren in the 1930s and 1940s would require large institutional buildings with multi-functional spaces to match complex social and academic aspirations. The architecture, like the pedagogic philosophy, was seen as an instrument for social change rather than solidification (of the existing social status) as had been the Victorian vision for mass education. The buildings were to be democratic and open reflections of the new societies aspired to by British politicians and educationalists such as Henry Morris, Secretary for Education at Cambridge County Council. He rejected all aspects of the past, including 'the magical view of man and the universe', which had seeped down into the work of certain educational designers, such as those pursuing the Steiner philosophy.¹⁸

Schools were to be based on scientific principles as befitted the age, with a democratic philosophy which (in principle) held that within the context of the school, children developed best through social interaction with their peers, both inside and outside the classroom. In short, the new buildings for education were to be 'cities of childhood' encompassing all the variety and richness implied in Giancarlo's opening quotation, yet adopting the new spirit of modern architecture. They were certainly institutions, yet their pedagogic emphasis shifted away from authoritarianism *per se* towards a freer more balanced approach, adopting many principles of the more extreme educators such as Susan Isaacs.

This could be seen in less self-conscious spatial hierarchies which did away with segregation of the genders as initiated in Garnier's school designs. However, the two to three stage structure comprising pre-school, primary and secondary schools which had developed as a response to the 1870 Act remained remarkably intact within the UK and elsewhere. This, one suspects, was due in no small measure to the traditional urban school environments inherited by the new educators. The architect's desire to lift the nineteenth century institutional weight of the building to reflect a more modern visionary spirit is caught by Summerson's '... profound desire to escape from the remorseless discipline of gravity, a desire to dissolve the heavy prose of building into ... a multiple, imponderable pile of heavenly mansions.'¹⁹ This was exemplified by the move towards lightweight building technologies away from traditional masonry construction.

Pre-First World War health concerns continued to be applied during the inter-war years. This had been seen first in the early open-air school movements. Major conferences on school hygiene were held at Nuremberg in 1905, in London in 1907 and in Paris in 1910. They were attended by a large percentage of the medical profession. A special deputation from the BMA was made to the president of the board of education on the necessity for the teaching of hygiene in schools. An open-air school required a garden site and the adaptability of classrooms which could be opened completely on one side. This enabled teaching to be carried out virtually outdoors for much of the year. The lightness of touch and inside/outside themes were prefaced by Margaret MacMillan when she had referred to the new schools as 'cities of childhood':

The idea of a large and strongly built edifice as a school for children went by the board long ago. To hold such a conception (and it was long held) as if one, escaping from a cave dwelling, insisted on living in a large prison ... The school of tomorrow will be a garden city of children; that is to say a place of many shelters – a township, if you will, of small schools built as one community but with every shelter organized as a separate unit designed to meet the

*needs of children of specific age or stage of life ... every shelter is in effect a small school, it is also a self contained unit or school home ...*²⁰

A very early example of this thinking was applied to the Whiteley Woods School in Sheffield. Provided for the sickly children living in the centre of the city, it comprised a series of timber pavilion type classroom buildings each with a retractable wall on one side. Within the framework of the curriculum, hygiene was taught for two hours per day. A rest period was obligatory. Ralph Williams, the Sheffield Medical Officer, alluded to the importance of the garden spaces when he said: *'More space should be made of the playgrounds of the ordinary elementary schools during the summer months, classes should be held in the open air, and nature study walks in the country for children attending schools in the centre of the city should be frequently undertaken.'*²¹

In later years, the importance of a hygienic environment was emphasized in the form of numerous hybrid designs, with classrooms articulated as pavilions which were linked together by 'marching' corridors, colonnades or open courtyards. These combined the advantages of cross-ventilation and all-round natural light within classrooms, without children having to get wet when moving around the school. In 1911, George Widows designed a school at Highfields, Long Eaton, which comprised a tripartite plan bisected centrally by a broad corridor, which was to be used for drill lessons. It had an open veranda on both sides. There were six classrooms, one for each standard, with two central classrooms linked by folding wall/doors which could be thrown open to provide a single assembly hall. The form was considered highly experimental by the Board of Education, and only six examples were ever built. Seaborne and Lowe assert that whilst establishing the principles of much twentieth century school design, these buildings paid little attention to architectural style: *'They were among the most hygienic and ugliest of English school buildings.'*²²

The 1931 Hadow Report on the primary school recommended that the full use of the environment should be made and that school design be influenced by the open-air principles. Consequently, primary schools built just before and immediately after the war incorporated classrooms, halls and corridors which were generally more spacious than their predecessors. Furthermore, they were located wherever possible on open greenfield sites with southerly aspects. Many retained the open-air feel with window/door partitions which could be opened fully. This set the pattern for a large proportion of the new schools commissioned after the Second World War; they were often located around the edges of the expanding suburbs, rather than in urban locations within the city centres. There was a concern for health, fresh air and ventilation. In later years, the best new architecture which was at the cutting edge of

technological innovation incorporated these health features.

The Architects and Buildings Branch of the UK government's Education Department also had a key role to play in the development of new and innovative ideas. Established in 1949, they produced guidance for the LEAs which was based on research and considerable in-house expertise. They became the intermediaries between the Ministry of Education, dictating policy to the communities in receipt of funding for the construction of new schools. As a result of material and labour shortages one of their concerns was to produce good quality schools at a fraction of the traditional build cost. They took many of the lessons on prefabrication learnt in Hertfordshire, where the local aircraft industry had acted as the catalyst to new methods of construction and procurement.

Stirrat Johnson-Marshall, the Chief Architect at the Ministry of Education from 1948, was a keen advocate of prefabrication. He was concerned with two key issues: choice and control. Choice meant that there would be several independent competitive systems available. Control meant that they should all use the same module such that components were interchangeable between systems. This in theory meant that an infinite number of variations was possible. The strategy was to develop proprietary products with existing manufacturers for use in schools designed by the Ministry. Between 1949 and 1957 the development group devised five complete systems, all of which were lightweight constructions designed for buildings up to three or four storeys in height. They economized on wet trades and all but one used the 3 ft 4 inch Hertfordshire module. The commitment of the manufacturers had to go beyond purely financial considerations and they explored new ways of dealing with social and educational concerns. One of the first such schools to be constructed in this way was St Crispin's Secondary Modern in Wokingham, which opened in 1953.

The well funded A & B Branch were able to take a longer term strategic view of educational buildings than the LEAs, responding to the needs of communities up and down the country. For example, during the early 1950s, activity focused predominantly on urban and suburban facilities, at the expense of small village schools which often lay at the heart of the areas they served, acting as surrogate community centres. A programme to regenerate village schools, many of which had small cellular spaces, heavy pre-war furniture and dangerous open stoves, was instigated. The Ministry of Education Building Bulletin No. 3, which appeared in June 1961, took two typical examples of village schools and provided information on appropriate modifications. The bulletin included detailed building specifications. Such guidance was used to great effect over the following twenty years on other village schools.

The closeness of government architects to education policy enabled the new school buildings to be tailored

more to the needs of the evolving educational curricula. The Plowden Report directed classroom activities away from work in large groups, towards smaller group activities. The basis of the proposals came from similar American prototypes which had adopted an open, zoned approach to the organization of the school. It was not exactly a return to the single volume school room, but in terms of its general openness, it came close. The success of the system would very much depend on the way in which the teacher could organize and control space, to provide three clear zones: a generous outside covered space, a messy practical zone, and a zone for reading, writing and arithmetic which maintained the discipline of children interacting with each other.

Such was the fluid movement of educational ideas that similar thinking infused other countries of the developed world in their own new buildings for mass education. Sophisticated modern architecture first appeared in European state schools designed in the early 1930s – Dudok in Hilversum, André Lurcat in Villejuif near Paris and Duiker in Amsterdam. This work was in strong contrast to the hygiene-obsessed utilitarianism of many schools built at that time within the UK. One of the foremost examples of the new school architecture was a project designed by Jan Duiker and Bernard Bijboet in 1927. The commission was for an open-air school 'for the healthy child' in a suburb of Amsterdam. As Jan Molema described it at the time, the work would create: *'... one of his most outstanding and characteristic buildings. Like a transparent sparkling crystal the school expressed Duiker's desire for a healthier society.'*²³

Duiker's first plan was for a T-shaped building with a smaller one-storey rectangular block connected by a covered way. The main part was on four floors with staircases which had projecting landings at each end, reminiscent of a Le Corbusier balcony detail. However, the indoor and outdoor classroom arrangements were unsatisfactory so modifications were made to achieve an improved relationship. Unfortunately, negotiations by the local authority and the client for the original site proposed for the new school were abandoned because of a lack of funds. The building was relocated from an expansive green field site to a more urban setting within the centre of a perimeter block. Modifications were made to Duiker's earlier scheme, incorporating a new entrance block, an entrance gateway, a handicraft room and a cycle shed. The building fitted its new site remarkably well.

The greatest design modification was the rotation of the main block in order to introduce a diagonal axis into the plan. The structural columns at the corners were then displaced to the centre of the external walls, and the classrooms were interchanged. This produced a refined building with a slender concrete frame, a maximum amount of openness and free-standing siting, all of which gave the school a delightfully light quality. The plan on the upper

floor comprised three truncated squares on a diagonal rotation, served by a central staircase and lifts. Two of the stairs on each floor were glazed, lending an airy transparency to the circulation routes. The gymnasium was formed by an extended leg on the diagonal. Classrooms were accommodated on four storeys, with the gymnasium beneath provided within an extra half level, dug out from the basement. Duiker's inspiring school was strongly influenced by Russian constructivism, the concretization of a revolutionary ideology.

The Italian Rationalists, of which Giuseppe Terragni (1904–1943) was at the forefront, incorporated the structural discipline of the machine age with nationalist values of Italian Classicism. According to Mimica and Shannon, the Sant'Elia nursery school in Como designed by Terragni was a 'canonical' representation of the school type in its synthesis of tradition and innovation.²⁴ All furniture and fittings were designed in lightweight materials at child scales. Classrooms had opening partitions for flexibility yet the whole building was integrated and solid in its architectural composition. Inspired by Duiker's open-air school, each classroom had its own outdoor terrace with canvas awnings, defined and supported by a bold concrete screen wall. Boundaries between indoors and outdoors were dissolved, an effect which was enhanced by external night lighting reflected up onto the bright concrete surfaces, to accentuate the rhythmic verticals of the entrance porches.

Six years later, Eugene Beaudouin and Marcel Lods, who had collaborated on Cité de la Muette à Drancy, designed an open-air school located at Suresnes, six kilometres to the west of Paris. It was designed for children whose fragile health prevented them from attending the normal schools of the commune, and integrated the special needs sections into the structure of an ordinary school. Sited on the south slopes of Mont Valerien, its natural east-west orientation strongly influenced the layout of the school spaces. The main block was two storeys in height and 75 metres in length. Boys were accommodated in the west wing and girls in the east with the kindergarten occupying the centre block. An octagonal classroom was rather self-consciously placed in the garden adjacent to the kindergarten for children with learning difficulties. The eight 'pavilion' classrooms were arrow-headed in layout, connected to the main block only by lightweight covered arcades. The roofs of these arcades acted as access points to sun-decks on top of the classrooms. The medical unit was at the intersection of these covered ways. Each classroom was surrounded by grass and was openable on one side, to provide the best possible environment for learning.

The school accommodated up to 350 children arranged in the form of eight ordinary classes, a special class and two kindergarten classes. The intake was to be thirty pupils per year, selected on medical grounds from other

schools around the commune. There were thirty children to each class, which were sex segregated. In the main school, children aged 6–14 years were accommodated, whilst the kindergarten had spaces for forty children aged 4–6 years. The isolated class system was developed as the best answer to the needs of health and teaching. Boys and girls had separate entrances into the main block. On the ground floor, children reached classrooms from exercise spaces by means of covered ways. Both girls and boys each had their own communal dining rooms, service pantries and rest rooms.

The rest period was intended to take place on the sun-decks, weather permitting. The constructional system was similar to that used at Cité de la Mette à Drancy near Paris by the same architects. It consisted of standardized wall and floor units supported on a steel frame. Floor units were of reinforced concrete frames with infill concrete slabs. External wall slabs were of concrete finished with white pebbles set in. These were used for north walls of classrooms and north and side walls of the main block. All other external walls were glazed, with horizontally sliding doors and windows, or infilled panels of sheet steel. It was an example of an advanced open-air school laid out as a city of childhood. It is conceivable that this influenced a generation of school designers who were developing similar green field sites.

Willem Marinus Dudok was born in Amsterdam in 1884 and moved to Hilversum in 1915. His early work was influenced by Berlage and his attraction to the massive grandeur of the Romanesque. Later work appeared to derive its style from both the expressionist Amsterdam school of Kramer and De Klerk, and the De Stijl movement, where giant horizontal and vertical elements dominated. When Dudok was appointed director of public works in 1915, the town was in the process of rapid growth, from what had been merely a large farming village. Textile mills and farming were flourishing and the new railway passing through Hilversum linked it directly to Amsterdam. This produced growth in local industries and, as a consequence, a substantial increase of the residential population. During the course of his professional career, Dudok designed and built eighteen schools, eight of which were built at the heart of new housing districts in Hilversum.

Between 1916 and 1918 Dudok produced a programme for the town's growth, and planned to achieve an urban architecture with an overall system of space whereby groups of basic urban units could be utilized in a variety of ways. Following Raymond Unwin's ideas, the working class districts of Hilversum were designed to provide adaptable relationships between, on the one hand, the house and garden, and on the other, groups of buildings and urban spaces. Dudok used this urban vocabulary primarily on low-cost housing projects and schools. Public buildings, such as theatres, swimming baths and schools, were to have an urban presence acting as focal points for

the local community. Sometimes, as was the case with the Hedenschool of 1926, with its double L-shaped plan, the gymnasium itself doubled as a community centre.

Many critics believe that Dudok's was a rather indulgent pluralistic approach. The evolution of his designs for schools neither developed chronologically, nor did they demonstrate a maturing language of architecture. Sometimes they recalled tradition, sometimes the buildings stressed function and user needs; alternatively, historicism was evoked, and even new fashionable trends in architectural language. Dudok was a latter-day eclectic, choosing a style on the basis of his personal taste at that time. These divergent preoccupations are exemplified by the Berlage-influenced Geranium School of 1916–18, followed in 1921–22 by the Bavinck School, a stereometric play of geometry very much in the manner of De Stijl, and subsequently in the 1926 Fabritius School. There, Dudok exploited the vocabulary of vernacular architecture, mixing traditional materials, under a thatched roof, with continuous industrial-style glazing, set on rendered walls. Tiny staircase towers and the heating chimney helped to articulate the composition.

Dudok never embraced, nor was he embraced by, the ideas of the new international movements in architecture and design. Fifty years ago in *Space, Time and Architecture*, the myopic Siegfried Gideon dismissed Dudok with a single line, describing his work as merely romantic. However, the school work was copied in some quarters, particularly during the 1930s, as it combined elements of tradition with the expressive mass and volume of the constructivists and De Stijl. For example, the Burlington Secondary School (1935) by Burnet Tait and Lorne was highly derivative of Snelliusschool School in Hilversum and others of the early 1930s. Designed for a long narrow site next to Wormwood Scrubs, it is articulated with ponderous deliberation in its horizontal and vertical massing. It is self-consciously asymmetrical to break with classical tradition and has strip windows with brick cladding. However, it incorporates the flexibility of a concrete structural frame. The classrooms are all south-facing, onto the playground areas, with the school hall and entrance block placed as a barrier between the classrooms and the busy main road. Despite its ambivalence, it has outlasted much of the later modernist work, in providing environmentally workable and pragmatic accommodation, in a form with which many ordinary people can relate. This hybrid building is still in a very usable condition today, having accommodated the vicissitudes of generations of noisy teenagers.

Modernism in mainstream school design

Many of the ideas which influenced two generations of school architects in the UK were included in a special issue



Figure 1.18
Burlington Secondary School (1935), London, by Burnet Tait and Lorne. (Photo: © Mark Dudek.)

of the *Architectural Review* published in July 1940. What was not discussed were the fascinating architectural precedents which largely dictated the style of these new buildings. There appears to be strong de Stijl influence at work, seen in the intersecting planes of Rietveld's work, and in the use of ashlar as a cladding material. Le Corbusier's

Swiss Pavilion and the Villa at Toulon were similarly of great significance. Rubble walls were not used in their traditional way, but as single wall planes offset by large infill glazing panels, all supported by a separate structural frame. These buildings incorporated new spatial relationships and geometric principles which appealed to young

designers as truly vintage modern buildings paralleled in the 1930s only by the work of Breuer and Lubetkin in the UK, Lurcat in France and Neutra in the USA.

A little-known precursor to all of this was one of Alvar Aalto's earliest buildings. In June 1938 the county council of Inkeroinen (in the region of Anjalankoski) bought an area of 6000 sq. m on which to build a new elementary school. The following month Aalto was commissioned to produce a design which was to be as economic as possible. His drawings were approved unanimously; however, after September of that year Aalto was not involved on the site works due to commitments elsewhere.

The school was to accommodate 200 pupils. The entrance hall, which was two storeys high, contained an expressive staircase and a free-form gallery which suggests that it was contemporaneous with his other work of the time, such as Villa Mairea and the Finnish Pavilion in New York. The building was sited on a slope and stepped down in three elegant stages. It included a house for the headteacher. On the ground floor there was an apartment for the head cook, a gymnasium, storage, a boiler room and girls' and boys' locker rooms. The first floor included the entrance space, the school kitchen, the boys' workshop and lavatories. There was a teachers' lounge on the first floor with a girls' workshop and classrooms. On the third floor there were three more classrooms.

The overall effect of strip windows, piloti and spiral stairs referred back to Aalto's early rationalist period; however, it was still considered to be very modern and it is hard to believe how early it was conceived and built. It used rendered brick painted white, concrete beams and some timber framing. The building displays many of the features developed and refined by Aalto in his later work, such as a sophisticated response to the site with integrated horizontal and planar massing. The school exhibits for the first time many of the qualities which were to make Aalto famous in later years.

In 1937, adopting a similar form of elegant modernity, the young architect Denis Clarke Hall entered the influential *News Chronicle* competition and won the main section for the design of a larger school. The competition was held during a period of much new school commissioning and research. Other competition entries included those from Marcel Breuer and FRS Yorke, Erno Goldfinger, Denys Lasdun with Wells Coates, amongst others. Clearly they found the design of schools a new and exciting proposition well suited to the technologies promised by the modernist ethos. Mass repetitive construction allied to a pure abstract aesthetic seemed appropriate to the needs of education. Clarke Hall's success in this ideas competition led to a real commission from Frank Barraclough, a progressive education officer in Yorkshire. The project was for a new secondary school with a plan based largely on research Clarke Hall had carried out for his *News Chronicle* scheme.

Richmond High School for Girls had accommodation for 160 pupils. It was completed in 1940. The site, which was located on high ground with a south east orientation towards the Cleveland Hills, lay approximately half a mile from the centre of Richmond, Yorkshire. Local stone was used as a walling material with stone cobbles as paving for the forecourts. Paths were of smooth concrete with rough pebbles laid out in a geometrical form reflecting the rhythms of the whole building. Solid rubble walls were adopted for those parts of the construction which were small enough to be spanned by stone lintels. Concrete frame construction was used for walls which had larger openings. Each pair of classrooms had glazing on one side, set into concrete frames. The building was generally one storey throughout with the exception of a two-storey block of staff and library accommodation.

The free development of the plan on its green-field site gave Clarke Hall the opportunity to organize nearly everything on a single level. The two major environmental concerns were firstly the need for even light and ventilation and secondly acoustic isolation for the quiet areas intended for study. Classrooms were isolated in pairs, and articulated as independent pavilions with open terraces between. A wide central corridor connected the pavilions with short enclosed glazed links. This was the spine of the building and it accommodated all the book lockers and floor ducts carrying mains services. In its general principles, it was a development of the competition-winning scheme, with pavilions sitting in the landscape enclosing neat open courtyards internal to the plan.

In subsequent years it was much criticized because it treated education as a process with little concern for the diverse needs of people working and being taught within the building. Like many of its type, the environment was often cold in winter and hot in summer, and it was difficult to find spaces which fulfilled the need for more private contemplative activities; the acoustics of the quiet spaces were far from perfect. Most crucially, the extent to which Richmond became a model to be plagiarized in less appropriate settings by less accomplished designers became one of the main reasons for its widespread condemnation in later years; it set the wrong example. However, for its time this was a spirited building incorporating new spatial relationships which expressed modernism in its raw uncompromising state. It must have been an inspiring building to grow up in during its early years, whilst new and pristine.

The extent to which schools became the testing ground for later, grander projects by key architects of the twentieth century could be seen in a number of projects of this time. One can cite the work of Alvar Aalto, as previously mentioned, the Smithsons, Karl Ehn, Aldo Rossi and most importantly Denys Lasdun, who designed his first and most successful project for a school in Paddington, before going on to design London's National Theatre, amongst

numerous other high profile public buildings. Whereas Karl Ehn's Karl Marx Hof housing scheme of 1930 included an infant school within the enclosed space of a large island of housing, and Le Corbusier's nursery school was located on the roof of the *Unite d'habitation* at Marseilles (1947-52), Lasdun's Hallfield School was a dynamic composition in a *ville radieuse* layout, which nevertheless related well to its traditional urban context.

Initially designed as a Tecton commission with Lasdun as the partner in charge, it was completed after the dissolution of that practice in 1948. Lasdun dismissed the diagrammatic approach to design, eschewing modernist devices such as grids, boxes and stilts. Standardization for its own symbolic purpose, which dismissed the human element, was rejected perhaps as a response to Richmond. Instead an integration into its 2.75 acre urban site was sought, retaining most of the existing trees in a similar manner to Nev Churcher's Woodlea School. 45 years later (see Figures 3.11a-c, page 91, conceptual sketches of Woodlea and Hallfield Schools). Lasdun's concerns with the site ultimately forced on him the curvilinear block and the fragmented position of the various elements to produce its poetic and appealing form. When compared to the adjacent high rise housing blocks it appears humane and of a fitting scale: *... an approach is favoured in which individual human activities are enhanced by the articulation of spaces of different character, in which a building's unity of form and idea is considered paramount, and in which technique is made the servant of the controlling form. The humanism of this approach and the departure from mechanistic modern architecture are underlined by the biological analogies of the plan, especially the resemblance to the unfurling form of a plant, with stem, leaves and petals.*²⁵

The scheme included a long, twisting sinuous block, which houses junior school classrooms and staff rooms, all of which are east facing and on two floors. At the east end of the block there are dining facilities. Halfway down, the block is bisected by a cross route. This links two identical assembly halls, one above the other on the north side, and on the south, a group of four pentagonal pods, each divided in half to provide eight infant classrooms in a hybrid pavilion form. Thus the building develops a fragmented appearance when catering for infants, and a more conventional linear shape at junior school level. The main entrance is from the north and is organized as a connecting extension of the Hallfield housing scheme.

Administration, assembly and dining halls are stacked for structural economy. Close collaboration between the architect and the structural engineer ensured that load-bearing elements would be fully exploited for reasons of economy and to provide column-free space as necessary. In the junior classroom block, nine-inch brickwork is employed to form load-bearing cross walls at 24 ft centres providing optimum noise reduction. Deep reinforced concrete beams create a solid framework for the walls

which enclose the classrooms. A series of large-scale reinforced concrete mullions at 4 ft centres transfer loads from the first floor and roof levels only. The rhythm of the façade is emphasized by these elegant tapering vertical elements. The continuous glazing is set back slightly. All structural members are of pre-cast concrete faced with Portland Stone or in-situ reinforced concrete with natural and splatter dash coloured finishes, which lend a humane texture in a contemporary idiom.

Interior finishes continue in this solid, authentic vein. Pink sandlime bricks are used for the load-bearing cross walls and staircases. Internal panels of the junior school corridors are constructed in black bricks, and in the children's lavatory white glazed bricks are used. Bright colours are restricted to focal points at the end of vistas. Between the mullions in the dining halls, interior panels are available for mural paintings. In total the school comprises eight infant classes and ten junior school classes providing accommodation for 540 pupils. It is a building which, perhaps more than any of Lasdun's later projects, remains as fresh and appealing as the day it was opened; it is arguably his best work. The constraints of the difficult site place restraints on the extremes of modernist ideology, to create a school which is human in scale and detail. Almost 50 years after it first opened, with its robust structure and finishes Hallfield is still perfectly serviceable. Assembly halls and classrooms are used after school and at weekends for adult activities making it a building of immense value to the community.

By contrast, the infamous Hunstanton School in Norfolk, designed by Allison and Peter Smithson in 1949 (completed in 1954), has proved less durable. It possessed an even more mechanistic architectural image than Richmond, and unlike Hallfield, it had no site or client constraints. Influenced by Mies van der Rohe's work in Illinois and by the Palladian tracts in Wittkower's *The Principles of Architecture in the Age of Humanism*, the building caught the flavour of the times. Although the Smithsons said in 1953 that the form of the school was not arrived at through precedent, but by a careful study of educational needs, it seems more likely that the economic compactness of the planning was the main determining factor in its layout. The construction was similarly cheap, yet in a form which was 'radically chic' for its time.

Light and air was still seen as being very important in the 1940s, as a foil perhaps to the Victorian and Edwardian school interiors of Robson. In addition, the use of steel framing which allowed for maximum areas of glazing, fast track construction and an air of advanced purposeful technology in use, was the potent mix. However, the windows were detailed without sub-frames, so the glass was fixed straight onto the steel structure. Even under initial construction, 50 out of the thousand odd panes of glass had to be trimmed to fit, the tolerances required being too demanding for the manufacturing

process. In 1984, after many years of piecemeal repair, hundreds of panels were condemned for replacement. Tony Twiggs, Norfolk's deputy county architect at the time, said: '... after a clear frosty November night, I have watched panels shatter one by one as the sun has come up and heated them.'²⁶

In a similar vein, Douglas Little, headteacher in 1984, described how he would sit at his desk and watch the changing reflections in the windows as the sun moved round: the panes becoming concave or convex and then flat again. No wonder the architecture of schools was held in such low esteem in subsequent years. On the one hand, it was lauded by the architectural establishment winning prestigious awards, on the other the building contained extremes of technical incompetence integral to the design aesthetic. Recently, new glass panes have been fixed with timber sub-frames, a design compromise to the original minimalist concept at which the puritanical Smithsons would probably have been appalled.

Extensive repairs have also been made to the flat roofs. Acoustic problems have been attended to internally; however, the building plan is so geometrically complete that it is almost impossible to extend. One of its major problems is the need to accommodate 900 pupils, twice the number for which it was originally intended. As an echo of the Richmond School experience, the current headteacher suggests that it is '... a bit of a nightmare because the building is too cold in winter, hot in summer, the interior is too noisy and open and creates teaching difficulties, maintenance costs are high.'²⁷

However, the building was more economical than the Mies' Illinois example, with its specially designed windows and expensive broad flanged steel members. The Smithsons' building used an assembly of readily available components which they described as 'found'. The competition of 1949 was judged by only one assessor. This had been Denis Clarke Hall, architect for Richmond, which had been visited by the Smithsons in 1945. Despite the functional and performance shortcomings, it was an attempt to produce an exciting alternative to the more conventional approaches to school design at that time. In a certain light it appears Mondrianesque and contains perhaps unconscious allusions to de Stijl. The A & B Branch, however, never viewed it as a jewel in their crown, rather an expensive and irrelevant aberration.

Apart from the obvious radicality of its technology, access to the main teaching areas on the first floor were by way of ten staircases. There were almost no corridors to speak of and, as mentioned previously, circulation takes place by way of the entrance lobbies and the communal hall which is at the centre of the plan. '... The hall is used for everything, it's used for assemblies, it's used for naughties at break time, it's used for feeding, and 700 would go through that canteen, so it's actually quite a hive of activity. In many schools the hall is a sort of administrative corridor

through which you wouldn't be allowed to walk, now I can't be doing with all that. So the architecture probably does hold itself open to sort of stopping in corridors and chatting which helps the relationship with staff.'²⁸ Perhaps within these final comments some lessons can be learnt from the sad affair of Hunstanton School. The circulation is an integral part of the assembly hall, which in its better moments becomes a true forum where school staff and children are encouraged to function in an environment of variety and rich social interaction.

Hans Scharoun, Aldo van Eyck and Herman Hertzberger

The major historical developments in school design during the twentieth century would be incomplete without brief mention of Hans Scharoun. Aldo van Eyck and Herman Hertzberger working in Germany and Holland respectively. Where most school facilities are characterized by standardized classrooms, with little differentiation between rooms for younger and older children, Scharoun provided a more tailored humane approach. Whilst influenced by the functionalist ethos, his architecture was anti-modern movement. Van Eyck, with his sophisticated spatial ideas of harmony in motion, and the importance of the 'spaces in between', added another dimension to the theory of schools architecture. Both were immensely influential. Perhaps most important, however, has been the contribution of Herman Hertzberger, which is ongoing (see Case Studies 6 and 7). His work, initially on the Apollo Schools in Amsterdam (1980), illustrated new ways of enhancing the social relationships between the users, through the organization and detail suggested by the built form.

Scharoun was part of the later phase of the modern movement in architecture. Aalto had developed an international reputation before the war; whilst revered in Germany, Scharoun was little known elsewhere. He discouraged writing about his works and wrote little himself. He also remained in Germany throughout the war. As a consequence he was influenced by Hugo Haring's functionalist doctrine which was opposed to the international Modern Movement's interest in geometric abstraction. The clarity of his early work in the 1920s and 1930s was widely accepted by architectural writers as having a certain authentic international flavour. However, Scharoun thought of himself as a designer in a particular Nordic tradition – an approach which he believed contrasted with the Latin tradition, where rules of abstract mathematical harmony had prevailed.

In the post-war period, Scharoun designed three schools, two of which were built. His plans for a primary school in Darmstadt were launched at a conference entitled 'Man and Space', held in 1951. The unrealized

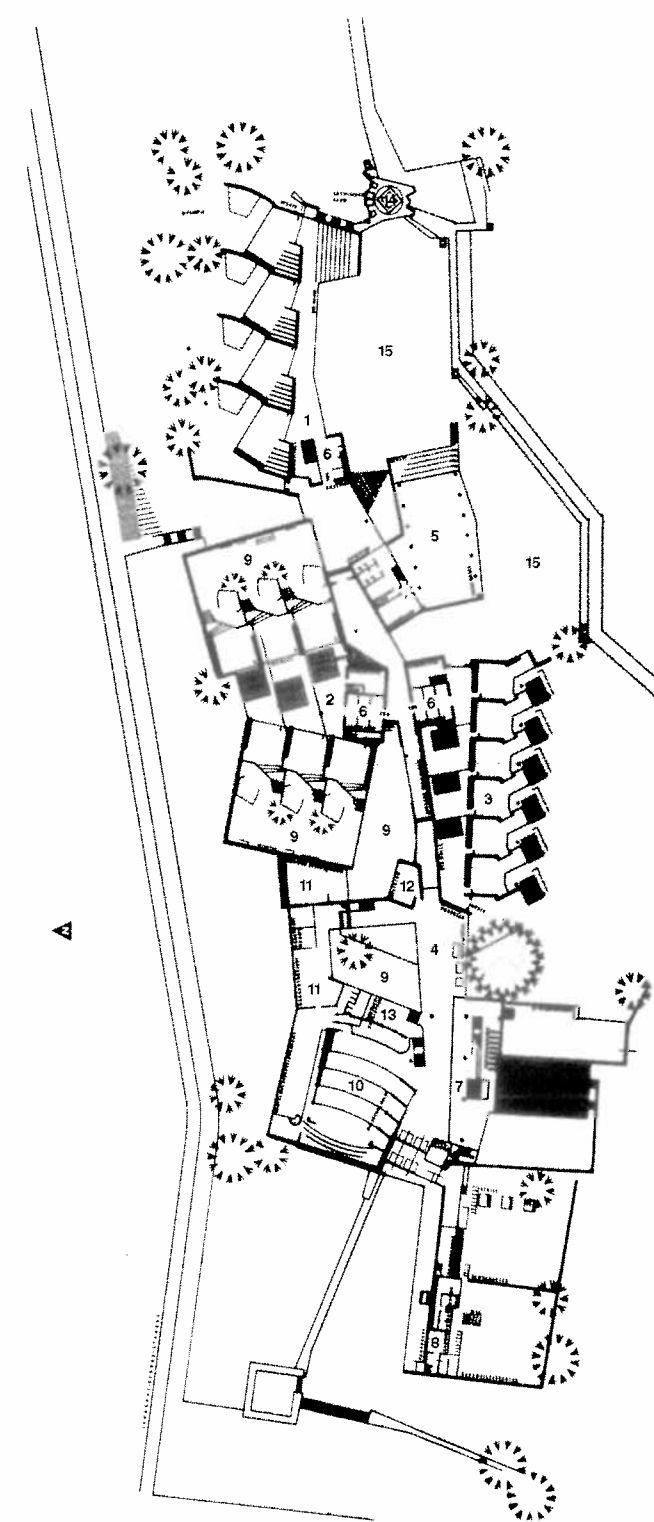


Figure 1.19
Ground floor plan of Hans Scharoun's project for a primary school, Darmstadt, 1951. (Hans Scharoun, Peter Blundell-Jones.)

- KEY:
- 1 Upper school
 - 2 Middle school
 - 3 Lower school
 - 4 'Meeting cloister'
 - 5 Gymnasium
 - 6 'Gatehouse towers' containing cloakrooms and WCs
 - 7 Staff and administration
 - 8 Porter's flat
 - 9 Courtyards
 - 10 Assembly hall
 - 11 Arts and handicrafts
 - 12 Chapel
 - 13 Library
 - 14 Observatory
 - 15 Playground

project was seen as a prototype which displayed the intrinsic social structure of the school community in its planning and organization. Subsequently he was commissioned to design two schools on similar principles at Lünen in 1956 and Marl in 1960. An interesting connection with John Dewey can be made as the designs are not merely about functional requirements, but are also concerned with the school's social role. The wider needs of the pupils were seen as of primary importance. Scharoun believed that the basic principles displayed in the design had a universal relevance which he employed in later public buildings. He saw the school as a microcosm of the city with the classrooms as houses, each with their own communal space articulated as a sort of internal street. Institutional elements of the programme such as the chapel and the assembly hall could be interpreted in terms of urban iconography as the church and the town hall. In this particular instance, the metaphor would be that of the fortified town familiar in that part of Germany, with the plan marked out with walls and tower-gatehouses.

The gatehouses were two-storey cloakrooms which served each wing of accommodation. Classrooms were arranged in three separate units each accommodating three school years with their own common rooms and cloakrooms. They were enclosed small communities within the overall framework of the school. The spatial sequence created a hierarchy which went from private to public. Starting first with the private domain, the pupil inhabits his or her own dedicated space within the classroom, then he or she belongs to the class social group, then the school unit, then the whole school and finally the locality or neighbourhood. The siting of the building and the colours used on the interiors related to the age of the pupils. The activity areas for children aged from 1 year to 3 years face south. Scharoun believed that the youngest children needed plenty of sun and light for physical and spiritual growth. Zones for educational and play activities were provided, comprising external teaching spaces as well as conventional teaching zones.

The second unit comprised classes for 4–6 year olds and was orientated east to west. This middle school wing emphasized a different sort of learning. Scharoun saw it as *'recognizing, understanding and experiencing interest in lessons and independent activities.'*²⁹ Development of the self within the community was the major issue in the final group for 7–9 year olds. This stage heralded self-identification by children who Scharoun believed were investigating their own personalities and beginning to explore ways of representing their individuality, an indirect reference to Freud's developmental concept of individuation. The classrooms face north and benefit from cool modulated light. The architecture reflects the pedagogical development theories of the time, where each phase of the child's growth is represented by a different type of space.

The area which links the classroom units to the rest of the school is a passage conceived of as a meeting place,

with additional facilities such as the assembly hall, staff rooms, the gymnasium and workrooms. Scharoun described the assembly hall as the 'mediating room'. It was an open area for a social mix of pupils of different ages from the three class wings. Pupils from other schools in the city were also welcomed to this section. Religion and biology rooms were located between unit areas. A domed cosmic room was situated at the eastern end of the school. The dome symbolized the heavens and the floor described a concentric square and circle depicting the earth within its cosmos. It was an important representation of the pupils and their relationship to the wider world, in this rich humanistic setting.

The Geschwister School in Lünen, Westphalia, gave Scharoun the opportunity to use his ideas of the organic in the context of a secondary school. It was a girls' high school for pupils aged ten to 18. The site was overshadowed to the north by the Church of the Sacred Heart, where, logically, Scharoun placed the main entrance. From there, physics, biology and chemistry classrooms were accessible from an elongated assembly hall. Classrooms were designed to be like small flats, homes familiar to many of the students. Included in the classroom cluster was an entrance/cloakroom area, an external teaching space and an annex. The specialized classroom wings utilized at Darmstadt were abandoned here in favour of the same standardized but sophisticated teaching units throughout.

As in the Darmstadt project, the school was divided into lower, middle and upper sections. To the south east, eight lower school classrooms were organized in a serrated formation along a wide internal street. To the south east, eight lower classrooms were planned in a similar linear serrated form. Next to them were the six classrooms of the middle school. The upper school had four classrooms at first floor accessed from the hall. The circular playground was located next to the assembly hall. Scharoun was trying to produce controllable spaces paralleling the child's development, whilst fostering growing independence. The form and layout of the rooms encouraged pupils to identify with their schoolrooms as a whole.

The issues Scharoun was grappling with were complex ones for the period. The architectural representation was compared in the visual arts to the work of the cubists. Different stages of connectedness to the whole, and the establishment of clear polar relationships, were the conceptual basis of the plan. However, they did not have a complementary sectional form, with all the spatial richness that implies, as seen in some of Scharoun's larger public buildings. Like a natural landscape they were spread out and disparate with considerable travel distances between different parts. The schools were a fragmentary assembly of parts. They were organized to respond to the precise needs of the user, and in the case of Darmstadt to the educational needs of each particular age group. In plan terms they were highly sophisticated, laid

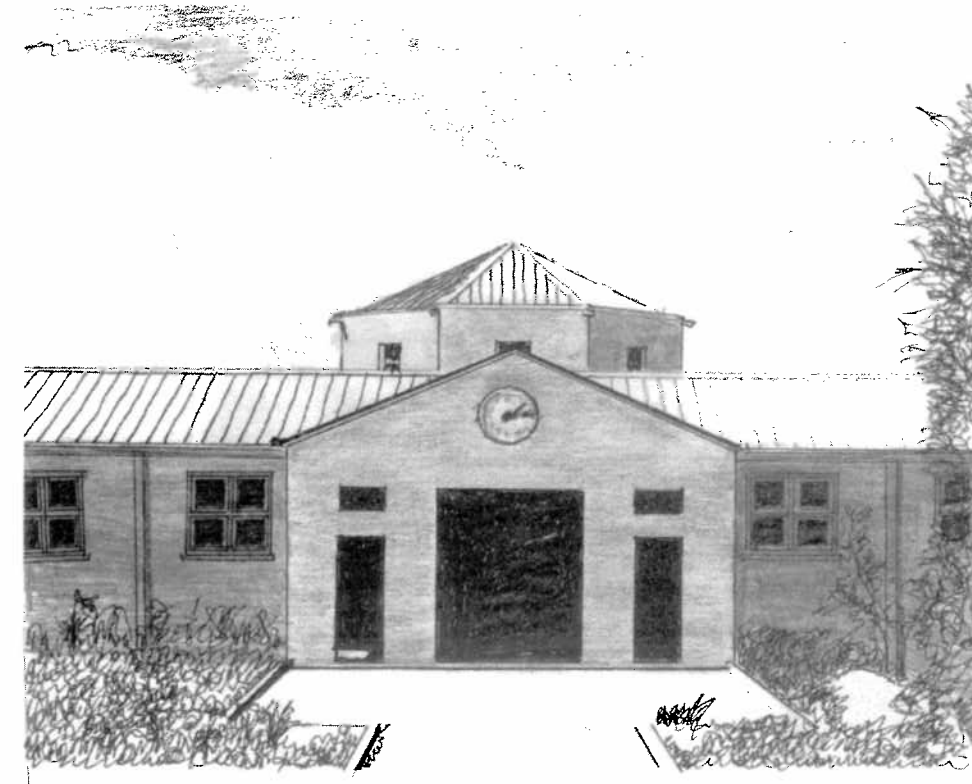


Figure 1.20
View of entrance to
secondary school (1976)
at Brondi by Aldo Rossi.
(© Kenneth Macdonald.)

out like geometric landscapes. They succeeded in establishing an alternative approach to the mechanistic layouts of most other schools being built at the time.

In the early 1950s, Aldo van Eyck was commissioned to design a new village community for Nagele, on the outskirts of Amsterdam, which was to incorporate three new schools. Although featureless architecturally, the Nagele schools were composed with an open centre with accommodation rotating around and away from the central square or courtyard. Each school had the 'centrifugal' playground at its heart, not surrounded symmetrically, but eccentrically, with the same block of accommodation bent around two sides of the space, or set eccentrically to the centre point of the courtyard. The classrooms were likewise arranged around small group halls in windmill pattern, encouraging circulation between spaces from a larger to a smaller scale. Halls and playgrounds interlocked and there were axial connections made between larger and smaller components of a similar disposition.

The system was applied to van Eyck's commission of 1955 for a municipal orphanage in Amsterdam. The deeply committed client, Frans van Meurs, had been an orphan himself. He wished to create a small idealized world, where residents could be given a more complete childhood than ordinary children. A utopian thinker, he commissioned van Eyck on the basis of his deep theoretic

cal approach to design. The brief which the development team created was unusually complex and evocative. It was a clear statement of impassioned prose on the proposed life patterns intended for the new orphans, and was very deterministic. Its image was intended to be anti-institutional and non-controlling; however, it appears to have created almost the opposite effect.

Van Eyck abandoned the static symmetrical form favoured for school institutions, instead adopting a more articulated version of the Nagele approach, with accommodation grouped in L-shaped blocks around open loggias and courts. They mediated between inside and outside, in theory creating a more fluid welcoming effect. Although lauded by the architectural establishment at the time, the orphanage proved less than successful. One young visitor was heard to ask his father: *'Do they lock boys away here?'* The architecture was certainly open and fluid, but it was also rigorously gridded and contained vertical age segregation which proved too inflexible an arrangement for later directors of the institution. Whilst incorporating some beautiful childlike details for integrated seating and sandpits which were in tune with the patterning of the plan, as a whole the project suffered from contractual difficulties. Van Eyck's design ideas were sometimes overruled and diluted by combined client and contractual pressures.



Figure 1.21
General view of the Orphanage, Amsterdam, designed by Aldo van Eyck. (Photo: © Mark Dudek.)

In the 1970s a new generation of educationalists rejected anything they considered authoritarian. This happened to include the architectural determinism imposed by most of the buildings in which they worked. Education was a process which flowed between individuals rather than institutions. They appeared to interpret the fixed feature configuration of the orphanage as controlling and over-institutional, exactly the opposite to Van Meur's original vision. Perhaps it was; the times had changed from the socialist principles of community groupings organized and fixed in time, god-like, by the client/architect team. The new educationalists saw the equipment and architectural features of the individual living areas as obstacles to their own pedagogic creativity. Perhaps more damaging was their perception of modernist buildings as inflexible and overbearing; an embodiment of the egotistical architect as a social manipulator of the under-privileged masses.

The building was badly maintained and by 1986 was in a dreadful state of repair, having been altered and somewhat vandalized. It was close to total demolition before an international group of conservationists led by Herman Hertzberger stepped in and persuaded the government to support a programme of restoration and to provide a new use. Now it operates as a school of architecture, a fitting epitaph for this highly theoretical work. Perhaps van Eyck and his client's difficulties were encapsulated in Hertzberger's own quotation from the opening section referring to '... a thing made exclusively for one purpose, suppresses the individual because it tells him exactly how it is to be used ...', which brings us neatly back to Hertzberger.

Herman Hertzberger was born in 1932. His interest in the school type has realized numerous designs which develop along similar lines. A major culmination of this came in 1980, when the authorities of Amsterdam granted him the commission to design two new primary schools side-by-side on Apollolaan, a boulevard and major axis on the south of the city. Although the programme for each was identical, the pedagogical ethos was radically different, one being a conventional state school and one being a Montessori school based on principles of development through the child's creativity, in contact with his or her peers.

Hertzberger's response to the somewhat degraded urban fabric was to choose a villa typology which referred to the surrounding residential character. The three-storey structures contained eight classrooms organized around a central atrium or communal hall. This was the crucial organizing device; with its open staircases and stepped terraces, the form took on a spatial dynamic which enabled the pupils to develop a constant awareness of their relationship between their own class group and the wider school community. Where most schools were organized horizontally, the Apollo Schools were vertical in disposition. In a much more controlled and spatially sophisticated way, this was a revisitation of the Hunstanton central hall system, which encouraged social interaction, whilst ensuring that the enclosed classes were available to support the needs of the less confident child.

The sophisticated integration of architectural and educational thinking marked these, and subsequent school projects by Hertzberger, as exemplars of a more social

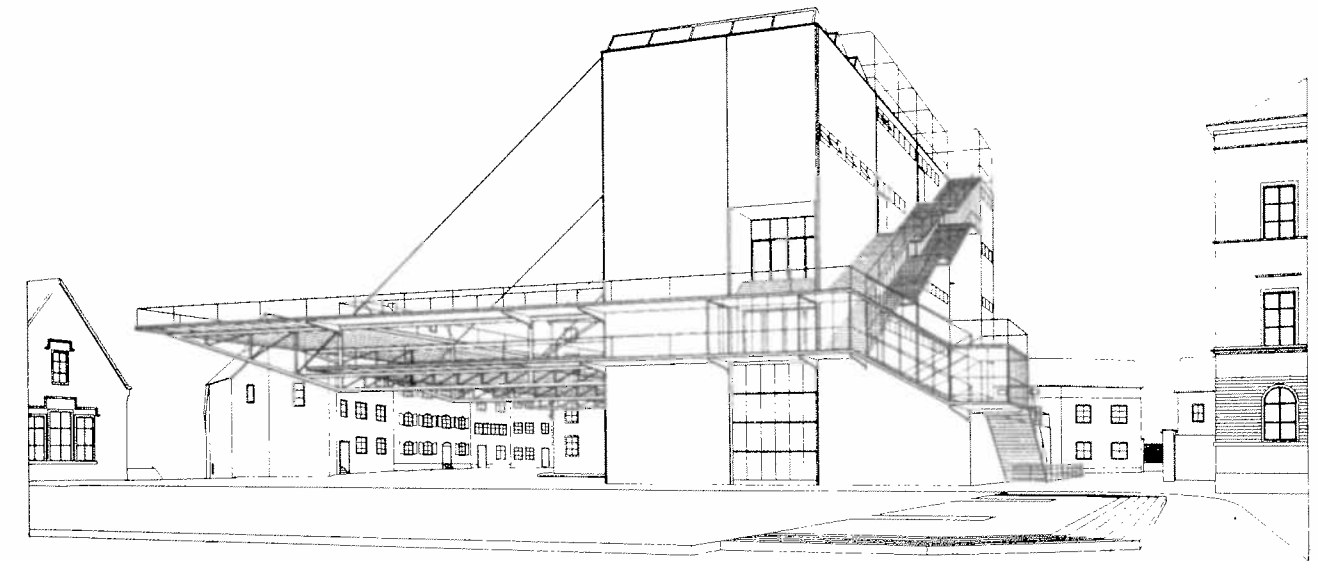


Figure 1.22a
Preliminary study, perspective sketch from the north-west.

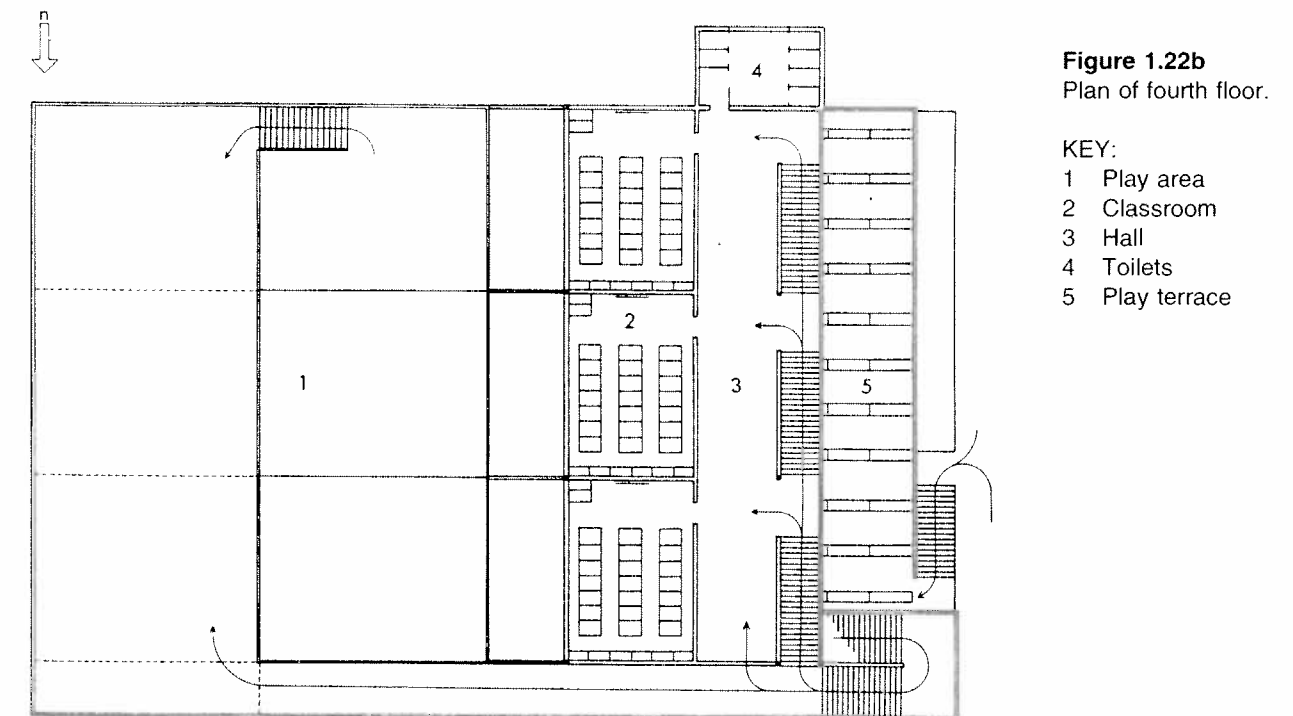


Figure 1.22b
Plan of fourth floor.

- KEY:
- 1 Play area
 - 2 Classroom
 - 3 Hall
 - 4 Toilets
 - 5 Play terrace

This project was designed by constructivists Hannes Meyer and Hans Wittwer in 1926. It is a primary school in the old quarter of Basle. Overshadowed by tall buildings, the school is elevated above street level with a playground on a giant suspended platform above the street. A grand external staircase connects each level of accommodation comprising three classrooms and a play terrace. This theoretical project was an imaginative response to the need for generous circulation areas, light and ventilation within the new urban schools during the 1930s (Schnaidt, Claude, *Hannes Meyer – Buildings, Projects, Writing*, Alex Tiranti, London, 1965).

approach. At a time of threat to the child's freedom to use the wider environment freely, due to stranger danger and traffic stress, this was an advanced strategy which as Kenneth Frampton observed, created: '... a school as a city-in-miniature, the school as a compensation, one might say, for the loss of a public forum in the community as a whole. It is difficult to imagine a more specifically political gesture than this and it would be hard to find any school built during the last twenty years that is of comparable critical subtlety and depth.'³⁰ Twenty years later the schools are still viewed as icons, much copied, and further developed by Hertzberger and others (see Case Studies 6 and 7).

Summary

During this brief canter through some of the most influential people connected with the historical development of schools architecture, these large buildings for mass education have grappled with the conflicting need to create humane environments for learning. Perhaps the culmination of this has been the work of Hans Scharoun at Darmstadt and my description of it as the geometric landscape. However, the focus has been on the built form rather than external spaces. There has been very little mention of the importance of the environment in its totality, or what is sometimes referred to as the 'micro sphere'. During the demolition of the iconic prefabricated school buildings of Alexander and Neutra in Los Angeles, they were dismissed as being: 'constructed in a simple industrial vernacular, had been placed according to a suburban mindset then typical of modernists who treated buildings as machines in the garden.'³¹ The critique ignored the notion of the buildings in their setting and the important relationship they established with the garden, which added a significant dimension to the social development of the pupil body.

Their interpretation as pavilions or little houses, to which each small class community could relate, was a theme which has been adopted by a number of educationists, particularly in the provision of pre-school facilities. The theme was touched upon by John Summerson in his essay 'Heavenly Mansions' when he described a type of play which is common to every child, where a shelter is formed out of a piece of furniture or a garden bower which takes on the symbolic characteristics of his or her own house. It becomes a necessary haven where the child can withdraw into a fantasy world away from the pressures of the public realm, a requirement which many child specialists believe is of psychological importance to children and school pupils throughout the education system:

... At a later stage, the child's conduct of the game is transferred to a new plane of realism; he constructs or uses dolls' houses and insists on a strict analogy

between his own practices and those of adult life – the doll's house must be an epitome of an adult's home. But whether the child is playing under the table or handling a doll's house, his imagination is working in the same way. He is placing either himself or the doll (a projection of himself) in a sheltered setting. The pleasure he [sic] derives from it is a pleasure in the relationship between himself (or the doll) and the setting.³²

Summerson goes on to assert that even as adults, many people never outgrow the need for this symbolic game, which he believes has much to do with the aesthetics of architecture: '... camping and sailing are two adult forms of play analogous to the "my house" pretences of a child.' However, the difference is well explained by this reference to camping and sailing. They are outdoor as opposed to indoor activities which assert the relationship of the sky and the sea at first hand. Whereas the need for the child to appropriate his or her own space still exists, it is no longer contained within the real life house (or school or kindergarten). The adult or older child would not construct the garden shed inside the house, whereas the pre-school child may well interpret the interior space of the nursery school as a microcosm of the world, an indoor garden in miniature, or a kindergarten.

Environmental psychologist Roger A. Hart views the interior and exterior architecture of the ideal school as one in which a child can develop an awareness of his or her surroundings, furnishing them with a lifelong skill which he describes as *environmental competence*. Referring to an earlier study which defined these safe manageable spaces where constructional toys could be laid out, sophisticated skills could be developed through an engagement with a world in miniature, as the 'micro sphere'. He states that: '... this micro sphere of physical objects allows pre-school children to gain competence and confidence before venturing out into the complex social macro sphere. This makes good sense, but I should note that in my own research I have noticed little or no decrease in children's interest in constructional play until they approach 12 years of age.'³³ The pre-school and primary school spaces are the context where this very important role-playing should be allowed to develop.

This implies that the role of the interior of the school takes on a more profound psychological significance than simply the machine for learning in. As stated previously, the need to provide a diverse range of internal spaces for the younger school child is perhaps more important than for the older child, who through his or her greater independence will be able to find symbolic shelters within the external environment – the conception of smoking behind the bicycle shed as a territorial assertion of the pupil's growing independence. However, it is my contention that the need for safe manageable social spaces

into which the secondary school pupil can withdraw to construct their own 'little shelters' should now be carefully conceived of as part of the schedule of accommodation for any new school.

There is growing evidence which suggests that many children are developing a close relationship with computer games as part of this need to withdraw. Part of the attraction lies in the visual and aural representation of three-dimensional spaces, which can be manipulated and effected by the operator. The little house syndrome is replicated by way of participation most often in the form of violent interactions. The figures or doors and windows of the buildings depicted can be demolished, but rarely are they constructed. The implications of this are firstly that a generation of children is developing a relationship with space, through their computers, which is obsessive and violent. Secondly, their ability to develop environmental awareness is limited, since the spaces of their computer are at best engaging only three of the senses.

With the UK government's emphasis on computer-aided learning, do we risk a generation of spatially impoverished adults? The remedy lies partly in the qualities of both the internal and the external school environment, conceived of in its totality, to provide rich spatial diversity as embodied in a Scharoun or a Lasdun school. The connection between the quality of the architecture and the learning outcome has been explicitly stated throughout this chapter. Whilst difficult to prove, particularly in the context of van Eyck's experience of educational practice during the 1960s and 1970s, it is nevertheless axiomatic and is reinforced by the author's own experience, and my ongoing discussions with numerous adults who benefited from good new school buildings during their formative years.³⁴

Notes

- 1 Hall, E.T., 'The anthropology of space.' An organizing model essay. In Prohansky, Ittelson and Rivlin (eds) *Environmental Psychology* (2nd edn): *People and their Physical Settings*, Holt Rinehart and Winston, New York, 1976. p.158.
- 2 Hertzberger, H., *Harvard Educational Review: Architecture and Education*, 39, 4, 1969, p.95.
- 3 Churchill was concerned how the restoration of the House of Commons should be brought about. He feared that a departure from the intimate confrontational public school debating tradition, as the parliamentary debating chambers had been designed, might transform the nature of British politics.
- 4 Arthur Conan Doyle, *Sherlock Holmes, The Case of the Stolen Naval Treaty*. Selected Stories, Oxford's World Classics, Oxford University Press, 1998. On 30 April 1998, a new government initiative aimed at identifying excellence in schools within the UK and

spreading good practice was announced. The 100 centres of excellence 'will be called "Beacon Schools" and will ... act as a guiding light for others to follow, by representing examples of good practice in areas such as: numeracy; literacy; tackling disaffection; or overall performance' (Department for Education and Employment press release).

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- 6 Robson, E.R., *School Architecture* (with an introduction by Malcolm Seaborne). Leicester University Press, The Victorian Library ..., 1972 (first published 1874), p.167.
- 7 Markus, Thomas A., *Buildings and Power*, Routledge, 1993, p.78, quoting originally from Stow, 1836.
- 8 Markus, Thomas A., *Buildings and Power*, Routledge, 1993, p.79.
- 9 Macleod, Robert, *Charles Rennie Mackintosh: Architect and Artist*, E.P. Dutton Inc, 1983, p.12.
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- 19 Summerson, John, *Heavenly Mansions ... and other Essays on Architecture*, Norton Library, 1963, p.9.
- 20 Margaret Macmillan quoted in Dudek, Mark, *Kindergarten Architecture*, E. & F.N. Spon, London, 1996, p.1.
- 21 Williams, R.P. 'Open air recovery school at Whiteley Wood', *School Hygiene*, 1911, p.132. Quoted in Seaborne, Malcolm, *The English School: Its Architecture and Organisation 1370-1870*, Routledge & Kegan Paul, London, 1971.
- 22 Seaborne, M. and Lowe, R., *The English School: Its Architecture and Organisation 1870-1970*, (2nd edn), Routledge & Kegan Paul, London, 1977, p.93.
- 23 Duiker, J., *Jan Molima*, Uitgeverij 010, Rotterdam, 1989, p.18.

- 24 Refer to Mimica, V. and Shannon, K., 'Utopia as tradition'. In Bullivant, L. (ed) *Kidsize, the Material World of the Child* Skira, 1997, p.167.
- 25 Curtis, W.J.R., *Denys Lasdun; Architecture, City, Landscape ...*, Pall Mall Press, 1974, p.12.
- 26 Spring, Martin, 'Smithson's School.' *Building*, 28 September 1984, p.10.
- 27 *RIBA Journal*, January 1997. Masterclass, Dan Cruickshank's history lesson on Hunstanton School, quotation from the headteacher, Kate Shaw, p.51.
- 28 'Comprehensive Architecture' a diploma dissertation (1998/99) submitted to the School of Architecture, University of Sheffield by Andrew Mortimor. The quotation is taken from an interview with the headteacher Catherine Shaw on 15 October 1998.
- 29 Bürklee, J. Christoph. *Hans Scharoun*, Artemis, Zurich, 1993, p.105.
- 30 Frampton, Kenneth, *Modern Architecture: A Critical History* (3rd edn, revised and enlarged), Thames & Hudson, 1992, p.32.
- 31 'School extensions.' *Architectural Record*, July 1985.
- 32 Summerson, John, *Heavenly Mansions ... and other Essays on Architecture*, Norton Library, 1963, p.3.
- 33 Hart, R., 'Summer in the city.' *International Play Journal*, 1, 3 September 1993, E. & F.N. Spon.
- 34 The author is developing a research methodology which links good new school buildings with educational and social competence as part of his research activities within the School of Architecture, University of Sheffield.

2

The educational curriculum and its implications

Introduction

The first part of this chapter concerns itself with the educational curriculum within the UK, Canada and the USA. What must the teacher do in the modern classroom to be an effective educator? What concerns might the classroom teacher have with his or her environment, relating to the delivery of education, which the school designer should understand? I present an overview of the current educational debate, aimed at architects and designers who perhaps have little conception of the complexities surrounding the role of the classroom teacher. I present tentative proposals for the design of an ideal primary classroom, developed in consultation with an existing school community.

Well over a hundred different schools have been visited during the course of this research. Some of the most memorable observations made to us by teachers and educationalists about their environment and educational methods form the second part of this chapter. Whilst I am critical of certain aspects of the school environments to which I refer, I am also aware that the implications of some of those decisions may not be immediately apparent. I stress that part of the methodology used in this chapter was to challenge teachers to be spatially aware in order to relate their experience directly to the classroom environments within which teaching and learning currently takes place.

I begin with some definitions of school.

Schooling is universal, provided as a right to every child and therefore relatively easy to define and explain. The school is an institution which is intended to nurture, care for and educate children within the framework of structured age-related class groups. Schools will invariably be led by a headteacher, reporting to a board of governors, with one or two streams of mixed ability pupils of approximately thirty children. However there are a number of variations to this format, distinguished by smaller class



Figure 2.1

The Queen's Inclosure, Hampshire, activity in the central 'mall' – a spacious, calm environment. (Photo: © Hampshire County Architects.)