

From classrooms to Centres

Mary and David Medd's contribution to postwar school design in Britain

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This paper reports on the school design innovative strategies carried out by Mary and David Medd, breaking away from the idea of *classrooms* and incorporating the concept of *Centres* in the architectural discourse.

From *classrooms* to *Centres*: Mary and David Medd's contribution to post-War school design in Britain.

Paula Lacomba Montes and Alejandro Campos Uribe

After the Second World War, the County of Hertfordshire in Great Britain succeeded in overcoming an emergency situation where rapid reconstruction of school buildings had to take place, partly due to the Education Act of 1944 that raised the school leaving age from 14 to 15. In the school design field, Hertfordshire's achievements were deemed so satisfactory that they were transplanted to a national scale in 1949, when Stirrat Johnson-Marshall and other members transferred from Hertfordshire County Council to the Ministry of Education – which would become after 1964 the Department of Education and Science.

This period of school reconstruction involved many professionals who all made important contributions as to how the school building evolved in terms of space, as well as how this type of building was envisaged within the wider community of families, educationists, administrators and politicians. This paper highlights the contribution, which in terms of design was remarkable, of the architects David Leslie Medd (1917–2009) and Mary Medd (1907–2005) (née Beaumont Crowley), members of the Development Group, who worked as civil servants until after the 1970s. This couple managed to synchronise education and construction so as to suggest an architectural response to the needs of the time; Mary as an architect with a high-quality attention on educational issues and David, also an architect, but most closely concerned with technical developments. In 1941 Mary Medd was recruited as an architect to work within the Department of Education at Hertfordshire County Council by John Newsom, to advise on the provision of school kitchens; David Medd, who joined Hertfordshire later with Johnson-Marshall, designed prototypes for future programmes, as he himself explained in his personal account dated 2009.¹

The existing documented record, elaborated by architectural historians such as Andrew Saint (1987), Stuart Maclure (1984), Catherine Burke (2013), and in some specific studies developed by Geraint Franklin (2012); acknowledges thoroughly this period and the contribution of David and Mary Medd to the field of educational architecture in the post-war period. Burke's numerous critical contributions, especially her book on Mary Medd's life, reveals her role as a woman

and an architect very much concerned and involved on education and architecture matters.² Franklin's thematic study gives a detailed overview of the work within the Architects & Building Branch and analyses the architect-educator relationship through the examination of the Medds' work.³ Saint's renowned contribution explores the background which of course conditioned the Medd's work by a thorough analysis of the economic, social and economic circumstances, and details the importance of the prefabricated system in school construction that emerged in the period.⁴ Finally, Maclure's book includes a helpful section of school plans in which the Medds took part in the execution of the drawings.⁵

Overall, these existing enquiries have acknowledged the Medds' contribution to post-war British school design, but they have approached their work from a historical perspective, with no specific emphasis on typological innovations in the field of educational architecture. This article focuses on the Medds' contribution in the evolution of the school types in terms of space, that is, it aims to uncover their architectural strategies that transformed the school model.

Hertfordshire's experiment⁶ constitutes the basis for understanding the innovations and developments in school design including; firstly, an intense collaboration between professionals from different fields who exchanged ideas; secondly, a thorough research process regarding spatial, technical and programmatic aspects of school design; and thirdly, important developments in terms of constructional prefabricated systems. The sum of all these efforts gave way to new and experimental approaches to school design, which started to challenge the hegemony of the classroom as it had traditionally been conceived [1]. The prevailing tendency towards homogeneity in schools, often seen in Hertfordshire's early school plans, began to disappear, and new proposals within the Architects & Building Branch in the Ministry of Education later introduced new strategies that incorporated heterogeneity to school planning. Since the limited period that the Medds worked in Hertfordshire was insufficient to apply their design and educational approach to primary schools, the present article covers also some of these Development Projects.

Templewood and Burleigh Primary School 1948



Circulation area
Templewood Primary School, connected to the classroom by folding doors, 1950

1 Templewood and Burleigh School, 1948. Left: Circulation area. Centre: Hall. Right: Classroom and corridor. (Medds' Collection ME/E/19).

The Medds' contribution: from *classrooms* to *Centres*

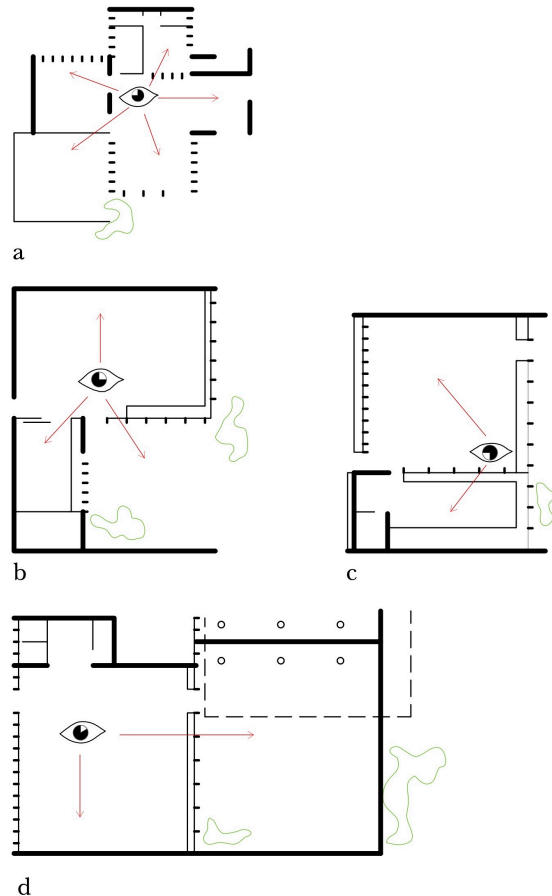
Before introducing Hertfordshire, as the precedent to the work carried out in the Ministry of Education, and in order to frame the Medds' design proposal in relation to a broader theoretical and historical architectural discourse, it is worth acknowledging the main features – in terms of space – of the school plans in the previous immediate period. From a typological perspective, the significance of the Medds' contribution should be measured against the early twentieth century shift from a room-based scheme, commonly known as *classrooms*, to a school as a set of *classrooms-units*, as was thoroughly studied by Alfred Roth in *The New School* (1950). Roth's research has proven to be one of the first and most important contributions to tackle the evolution of school buildings through the study of pedagogical and architectural principles corresponding to the period of the 1930-50s, with examples of schools built in Europe and the United States. The remarkable aspect of the survey is the emphasis on the *classroom* and the successive variations that it experienced according to the new learning methods that were being developed at the time.⁷

Up to the 1930s, according to Roth, the design of school buildings did not take into account the various functions that a school was to house. The solutions adopted, in most cases, were composed of a mere repetition of *classrooms*, all identical to each other. It is significant that this schematic design actually ignored not only all pedagogical requirements but, above all, the physical and psychological needs of the child. Symptomatic of this design approach is the fact that, once the urgent need for school construction was assumed by English public and financial institutions, as well as educational councils, the school building criteria was defined as the division of the school-aged population in *classrooms* of 30 children. However, Roth points out significant architectural contributions and changes taking place between 1930 and 1950, which he defined as the transition from a *classroom* to a *classroom-unit* scheme:

Although modern pedagogics demand some differentiated teaching methods and a considerable number of special purpose rooms, the classroom must still be considered the basic element of the school. In designing the classroom, account should be taken, on the one hand, of well-regulated lessons and the more independent activities and, on the other, of the need for a healthy, friendly and stimulating atmosphere. Such a classroom has little in common with the former conventional type. Actually, the classroom is now generally termed classroom-unit, the modern conception being based on Pestalozzi's dictum: 'The classroom must be a living room.'⁸

Hence, as the main achievement of pre-war school design, Roth highlights the leap that occurred in the nature of the teaching space, that shifted from a single room (*classroom* = cell) to a set of several smaller spaces around an open area (*classroom-unit*) [2]. If the conventional type, according to Roth, was that of a square room equipped with rows of tables and chairs which was associated to the Prussian

education system, the *classroom-unit* concept was a response to modern pedagogical methods. As the term *classroom-unit* implies, the teaching area was now a compound of several parts with diverse spatial conditions – for different activities – that was repeated as many times as needed throughout the school. Crow Islands School in Winnetka, 1940, by E. Saarinen, Perkins, Wheeler & Will, was highlighted as one of the first examples of this new approach: ‘the unique design of the *classroom-unit* increases the teaching possibilities considerably.’⁹



2 Some basic classroom types. a. Kindergarten; b. Classroom unit with teaching area, work room and outdoor space; c. Classroom unit with teaching area, work room and garden exit; d. Classroom unit with large teaching area, partly covered outdoor area. (Authors’ redrawing of Alfred Roth’s schemes in *The New School*).

The result of the *classroom-unit* concept can be observed more clearly in the school designs contemporaneous with the work of Mary and David Medd, such as the Darmstadt School by Hans Scharoun in 1951, and the Delft Montessori School by the Dutch architect Herman Hertzberger in 1960 [3]. In the latter the *classroom-unit* prevails as it is repeated or mirrored along the site, generating the whole school plan. Each *classroom-unit* is a compound of three spaces: main, crafts and lecture areas. In the former, the repetition of different *classroom-units* generated the different wings of the school plan, which varied according to the children’s age. It turns out that the use of the *classroom-unit* idea was also the main step carried out in

Hertfordshire during the 1940s and 50s, as the following section will explore. It needs to be recalled that the Medds' career started in Hertfordshire, so it is worth taking it as the starting point, as it was where their initial knowledge was achieved and was later on used to continue on their most radical proposals.



3 Top: Darmstadt School, 1951 by Hans Scharoun. Bottom: Montessori School in Delft, 1960 by Herman Hertzberger. Source: Authors' drawings.

The Medds' actual contribution, from an architectural design perspective, was to make a forward step in this educational/architectural evolutionary process: from the *classroom* to the *classroom-unit* (Hertfordshire), and finally to a school made of *Centres* (Ministry of Education). The disappearance of the *classroom* as a dominant space was the main input of their work, an entirely original and unheard of strategy at the time that was far from the so-called *open plan*. In their latest proposals at the Ministry of Education, the whole interior was to be defined by a sequence of small and dissimilar rooms, permanently separated but connected to each other (*Planning Ingredients*). This spatial change was supported by a deep understanding of the educational activities that were to take place in the schools, and involved a different perspective towards educational architecture, closer to a home than to an institution.

Understanding Hertfordshire

From 1948 to 1954, more than one hundred schools were built in the County of Hertfordshire, mainly due to an increase of 39,000 of the school population.¹⁰ There

were many professionals involved, but Charles Herbert Aslin, Stirrat Johnson-Marshall, S. Morrison, O. Carey, Anthony Cox, W. Henderson, W. D. Lacey, Bruce Martin, Mary and David Medd were particularly concerned with primary schools. From 1946 until 1949 the Medds' job was not to lead a team, but to carry out specific duties.

Mr L.F. Gibbon, a school inspector attached to the Department of Education and Science, recounts in the *Education* journal of 1964 the story of the early development in Hertfordshire where, in 1945, began a programme of emergency building known as HORSAs - Hutting Operation for the Raising of the School leaving Age. As Gibbon stressed, the shortcomings of the HORSAs huts were soon recognised by John Newsom, director of education for Hertfordshire, who decided that Hertfordshire should have 'schools designed for the new and continuing developments in teaching, not repetitive boxes in which teachers and children would have to adapt themselves as best as they could.'¹¹

The origin of this working process, which had its focal point in designing high-quality schools under restrictive circumstances, was that people with similar interests but different backgrounds pointed in the same direction. According to Gibbon, Johnson-Marshall, Mary and David Medd and Ernest Hinchliffe (a manufacturer of pre-fabricated steel frames), formed the main springs of the design and production team – which under the patronage of Aslin set out to answer Newsom's exacting educational requirements against the background of material, labour and financial stringency.¹² The Education Act of 1944, which emerged as a response to the growing social and educational demands created by the war, served as a basis for rethinking the educational models and methodologies employed by teachers in schools. It felt necessary to establish dialogues and collaborative processes that enriched this new language.¹³

During this early period, there was a research process that included visits to existing schools mainly by architects, encouraged by Newsom. This meant observing, drawing, analysing what was going on, and rehearsing it to reconsider how schools should be at that time, with regard to the new educational methods. Mary Medd carried out much of this work with Anthony Cox.¹⁴ She did many drawings of the children's ways of interacting with their environment and of the interrelations between teachers and children, which are collected in her notebooks and diaries, archived in the Institute of Education, University College London. The new ideas in terms of education and architecture incorporated emerging ways of understanding the child as the centre of learning development. These theories had been influenced by previous European thinkers such as Johann Heinrich Pestalozzi, Maria Montessori and Friedrich Froebel. But in this case it was not a question of applying a preconceived methodology, but of simultaneously developing the curriculum, the methods, and the learning spaces. The approach towards school design was an active one, meaning that different disciplines had to work together: architects, educationalists, teachers, manufacturers, engineers, and policymakers. As Guy Oddie explained, writing in the *Architectural Review* in 1963:

Mary Medd led the research into educational requirements, going out for long periods into existing schools, watching and listening to children and teachers at work, making imaginative assessments of their problems and what was needed to overcome them. Almost simultaneously, on the constructional side, the attempt began to design a 'Meccano set' capable of meeting the requirements Miss Crowley was discovering. Thereafter the whole development was a subtle interplay between educational and technical requirements reacting on each other.¹⁵

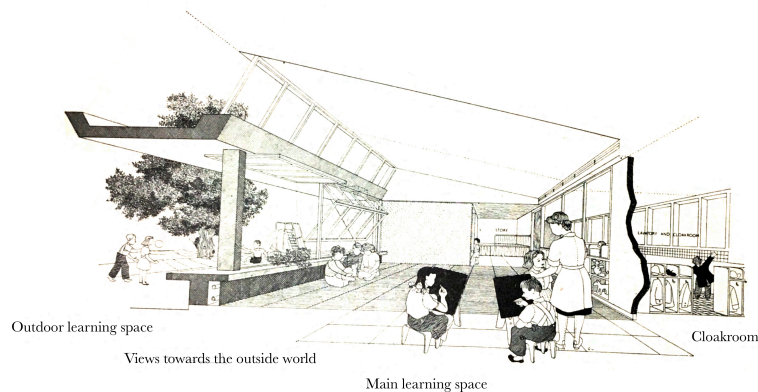
The outcome of these continuing negotiations came out in the form of a series of detailed briefs. From discussions with the educationalists, backed by studies of schools in action and some dimensional surveys of children, the architects were able to piece together a programme for a typical school. The buildings were to be designed for the children in the first place, then for the teachers, and finally for the governing body. The *classroom* was to be a child's familiar place, not only where he or she would have to work and play, but where belongings could be kept, and drawings pinned up so as to contribute to the creation of his or her own surroundings.¹⁶ The building was to be on a domestic and intimate scale, and to have a light and cheerful appearance and a reasonably high standard of finishes. Of course, there were also some later conclusions, when the process reached maturity in the Ministry of Education, as the examples will show. These ultimately led to significant changes in architectural layouts, based on the revolutionary layouts made by Mary Medd. As David Medd recalled in an interview in 1988:

She is well known for her desire to understand what people want to do and to talk to them and understand their position, and interpret their needs into buildings, plans especially, in a way that they couldn't have imagined. I think her planning skills are very considerable and especially at a time when one's designing down to a price, when one had to achieve what one wanted to achieve with the absolute minimum of square footage or square metreage. And the amount of jigsaw puzzle work she would do in order to get the relationships that they wanted within a less overall area she was very, very skilful at that.¹⁷

In addition, there were other experimental research processes where architects could work hand in hand with manufacturers on constructional systems, sanitary equipment, furniture, colour ranges, and so on, in order to design standardised equipment of high quality which was to be incorporated in the school programs.

Hertfordshire's architecture

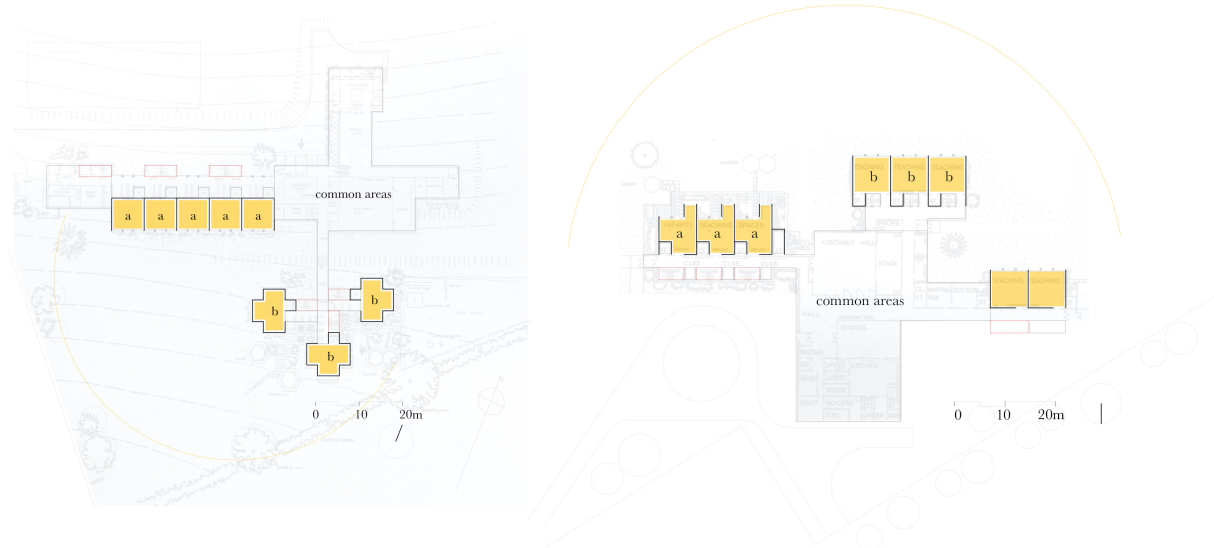
In order to understand Mary Medd's innovative layouts during their work at the Ministry, it is useful to start with Hertfordshire early school proposals, where some of the strategies were already incipient. The schools built within the Hertfordshire's programmes responded to the educational requirements, attending to site conditions and design interpretations. Some of the achievements introduced in Hertfordshire's school designs can be summarised in Gordon Cullen's drawing published in *The Architects' Journal* in 1948 that shows the main working area (playroom as it refers to a nursery school) with observation windows to the garden, bed stores at the end of the room and lavatories and cloakrooms on the right [4].



4 Nursery Schools: Planning Requirements and Technique Surveyed by Denys Lasdun.
Source: Drawing by Gordon Cullen. © Gordon Cullen Estate

The projects developed in the county of Hertfordshire were located on open sites and, generally, stretched out occupying an extensive surface. This relation with nature became meaningful due to the new learning methodologies, which implied 'learning by doing'¹⁸ through exploration, experimentation and discovery. Most programmes organised the school in sets, differentiating the infant and junior areas and the common spaces, which in most cases occupied the heart of the school. From the core, which contained the entrance and assembly hall, the dining area, the music and staff rooms, long wings extended forming the infant and the junior sets. Some schools were more linear in their structure, others opted for a staggered solution, and others turned to be more compact, reducing the circulation areas. The finger-plan, as it was called, was the most common typology whereby the footprint of the school extended right across the site. A selection of school projects (not all by the Medds, designers are given in captions) will be used to describe some of the architectural approaches of Hertfordshire.

The Architects' Department within the County of Hertfordshire tried out some changes arising from ideas put out by the Education Department. One of them dealt with breaking up the shape of infants' teaching spaces into a series of alcoves, each of which contained one or two small groups in which the infants would work, suggesting the use of the *classroom-unit* concept: 'the shape of the *classroom-unit* should contain a number of alcoves or recesses, or auxiliary rooms in which the children can be separated into a number of groups for varying activities.'¹⁹ This strategy can be seen at Borehamwood and Morgan's Walk School [5]. In 1950, in Borehamwood infants' school, *classrooms* were planned with an alcove of three bays to accommodate group activities. This decision broke with the regular square shape of the *classroom* and introduced new corners within the same area to increase learning opportunities and foster small group encounters. In the same way, the infants' teaching spaces in schools like Morgan's Walk (1948–49) contain a smaller space within the *classroom*, in this case very well integrated with the outdoor teaching area. The nook emerged from the inside space and opened

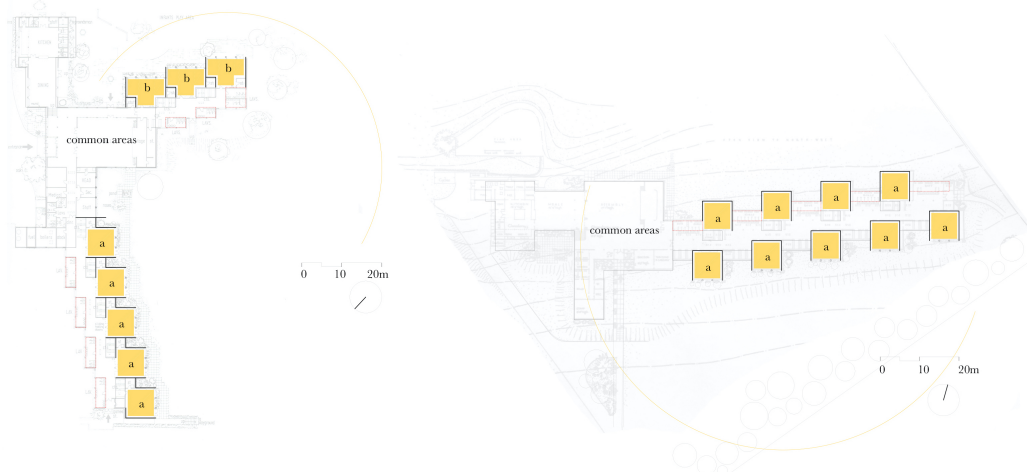


5 Left: Infant's area at Borehamwood J.M.I School, by A.R Garrod & Mary Crowley, 1948-9. (Authors' drawings combined with Medds' Collection DC/MA/B/7, Institute of Education, University College London).

Right: Infants teaching spaces at Morgan's Walk J.M.I School, Hertford, by B. Martin & M. Smith, 1949. (Authors' drawings combined with Medds' Collection ME/D/8, Institute of Education, University College London).

towards the outside world as a bay window, extending the views and capturing as much sunlight as possible. Even though the *classroom* still prevailed as the main unit of this infant set, this part of the school seemed to be a compact area, separated from the rest, becoming the children's own world. In Templewood, another design in the Hertfordshire programme was explored, in which the corridor becomes an extension of the *classroom*. Each *classroom* is a self-contained unit with its own corridor, store and cloakroom separated from the next one by sliding and folding

doors. Children lay on the floor to draw, they covered the walls with their own drawings, and as a result, the unit turned from a neutral space to a personal one, colonised by its users. In Spencer School St. Albans (1948–49) the circulation became more spacious, creating generous in-between areas in front of the lavatories and cloakrooms, which turned out to be as spacious as the *classrooms* themselves [6]. Across most designs the hall was the key feature of the school, but there was variation in how learning spaces related to it. Unlike the designs of Borehamwood or Morgan’s Walk, for instance, where the hall organised the school into classroom-wings, the teaching areas at Monkfrith School (1948–49) became small independent pavilions connected to a central body that contained the assembly hall, which used to be the main meeting point [7]. This type, where teaching areas gather around a central space, already presented the most common feature of compact plans, exactly as did the designs developed by the Medds in the Ministry of Education.



6 Left: Templewood JMI School, by A.W.C. Barr, 1949. (Authors’ drawings combined with The Architect and Building News September 30, 1949. (Medds’ Collection DC/MA/B/7).
 Right: Spencer School, by D. Barron, 1948-9. (Authors’ drawings combined with Medds’ Collection ME/D/5).



7 Monkfrith School Infant School, East Barnet, by Mary Crowley & O.J. Cox, 1948. (Authors’ drawings combined with Medds’ Collection ME/D/5).



8 Cheshunt: Burleigh JMI School: 1947. Typical classroom. Project architects: Bruce Martin and Mary and David Medd. Source: Hertfordshire County Council.

These and other strategies can be followed in Hertfordshire's schools, as well as other innovations concerning the use of standardised equipment and prefabricated building components, for example Croxley Green Junior School [8]. Looking closely at some details of the buildings, the main theoretical contribution of this architectural experiment comes from the small interventions regarding the *classroom-unit* and its spatial relations to other parts of the brief, but the school plans were mainly defined by a series of repetitive units. The school projects built in Hertfordshire within this period, from 1946 until 1949, reveal that three years was not long enough to perform all the research carried out in regard to how space could respond to educational demands. In fact, it took years to transform these investigations into design requirements in formal reports.

It was indeed a period too short to see the advances in built schools, in light of the innovations that would later be achieved within the Ministry of Education. To understand the full extent of this process, it is necessary to go beyond Hertfordshire and analyse the Medds' work within the Ministry of Education, the Development Projects, where their theories were fully transformed into built schools.

David and Mary Medd in the Ministry of Education

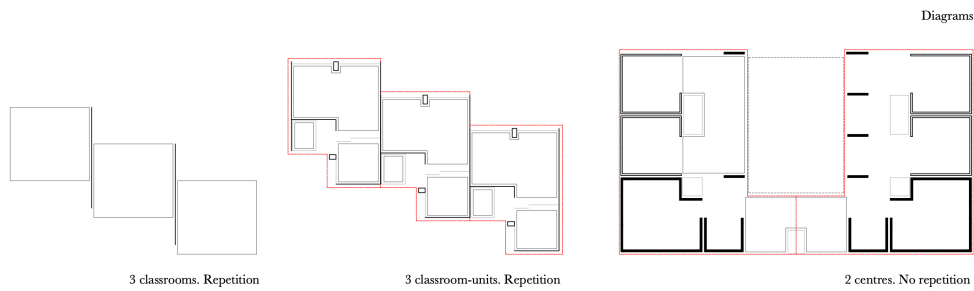
Although Hertfordshire's innovations could not be fully developed and applied to the designs, the Ministry of Education considered the experience fruitful and took the initiative of disseminating the knowledge generated through what would be known as *Building Bulletins*. These were a series of anonymous documented booklets that were first produced in 1949 and described different aspects of the school design processes. *Building Bulletin 1* set out all the aspects researched and developed in Hertfordshire. The Development Group, one of the two sections within Architects & Building Branch created inside the Ministry of Education as a body dedicated to putting all previous research into practice, therefore started with the dissemination of Hertfordshire's achievements.

The Development Group and the Medds' *Planning Ingredients*

While Hertfordshire still kept the *classroom-unit* as the main feature that defined the school plan, it wasn't until later that this began to be questioned. Mary and David Medd, who were appointed Heads of the Development Group in 1949, developed most of the architectural strategies of primary school plans. It wasn't until the Development Projects within the Architects & Building Branch that the most noticeable approaches in terms of space took place, with the aim of making the *classroom*, understood previously as a closed space, disappear towards an increased variety of learning spaces.

The way in which this variety advocated by the Medds was introduced to the design process, is what they called *Centres*, through a system known as the *Planning Ingredients*, a design methodology used in their school designs. As David Medd explained in a conference lecture at St. John's College in Cambridge in 1972:

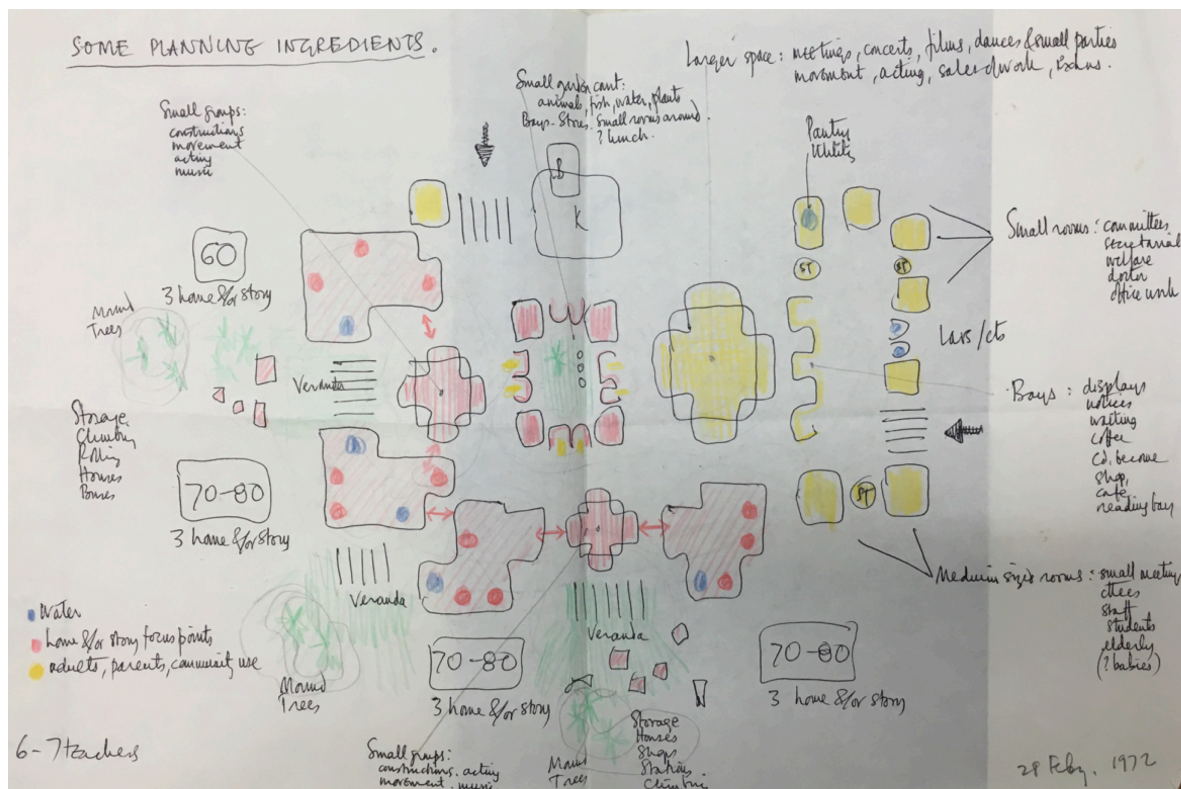
*The term Centre implies coherence, yet within it a mixture of provision for a definite number of people, to which they can feel they really belong. A Centre can take the form and size thought to be appropriate for the age range, the work, and the degree of sharing – if any – of teachers' skills and special equipment. There is no reason why there should not be – there often is – a room which is virtually a classroom within a Centre – for use for certain kinds of work with a fairly large group. But other kinds of space are needed too, for other kinds of work and other group sizes. The essential attribute of a Centre is that it should at the same time provide a secure relationship between pupils and teacher(s) as well as encourage the maximum opportunity for a variety of different kinds of work which interact with each other. Educators must determine the mixture within each Centre.*²⁰



9 Diagrams: from classroom, to classroom-unit, to Centre. Source: Authors' drawings

A school layout, according to the Medds, should no longer be made of a series of *classroom-units*, but *Centres*, bigger sets of smaller specialised rooms. From a programmatic viewpoint, we could contrast the term *Centre* to the concept of *classroom-unit*. If, according to Roth, the *classroom-units* housed between twenty-five and forty students, the Medds' *Centres* could accommodate one hundred or more students, depending on the educational requirements agreed in advance with educational authorities. Moreover, while *classroom-units* repeated throughout the schools' layouts, the *Centres* were always unique, designed with the concrete educational requirements in mind [9]. Within each *Centre*, there was a sequence of rooms, which would be later known as *Planning Ingredients*. Being generally larger units, each *Centre* resembled a big home, within which users could travel freely from room to room.

This new approach to school design is subtly shown in diagrams by Mary Medd, where the school is conceived as a sum of different parts [10]. The conception of space by parts encouraged the articulation of uses that, while remaining distinct and responding to the specific functions of a primary school, were integrated into a closed unit: 'it is accepted therefore that we are designing in terms of *Centres*, rather than *classrooms*, in which a variety of provision and the sharing of teachers' skills and equipment are possible.'²¹ Hence, the concept of *Centre* resulted in an entirely new school-design strategy which years after was given the name of *Built-in variety*, with the *Planning Ingredients* as the base of the approach. The *Planning Ingredients* proceeded by defining each space independently, proposing spatial qualities to respond to its needs and particularities. As David Medd puts it, 'are we now designing in terms of *Centres* instead of *classrooms* – if so, how is their size, their contents, and their character affected by the age of children?'²² The applied strategy eliminated the centrality and the condition of finite space in a traditional *classroom*, increasing the learning opportunities thanks to the division of the big *Centres* into sequences of dissimilar rooms.



10 'Some Planning Ingredients' by Mary Medd. Source: Medds' Collection, Institute of Education, University College London.

David Medd also expressed this way of designing in terms of polarities, building on the idea that a school should have something of real life: 'some of us believe that the building must encourage and provide a structure for variety responding to basic human needs such as withdrawal, gregariousness, quiet, noise, large scale, small scale, clean, dirty, inside and outside.'²³ The Medds, aware of the

need to propose a solution to the pedagogical advances in the schools, suggested a model where there was a complex network of opportunities that students took advantage of according to their needs. David Medd argued that the variety in the definition of school spaces was derived from the variety of activities that took place inside. He also pointed out that this was very far from what he understood as flexibility: 'we should abandon an abstract concept of flexibility for a real concept of variety,'²⁴ breaking with the homogeneity in order to force children to interact with the environment. Contrary to flexibility, 'variety is not a mechanical attribute, variety is an inherent characteristic that a school should possess – built in as it were.'²⁵

It is to be noted that David Medd had an opposite understanding of flexibility/variety to the one introduced by Roth in *The New School*, which referred to the transformability of the spaces. Roth assumed flexibility as a pedagogical requirement because, as far as he was concerned, all issues related to education were in a constant state of evolution, so that the interior should be able to be modified according to teaching needs. In a sense, this principle of flexibility was directed to the adaptation of the interior space to changing needs, as well as construction requirements such as the possibility of expanding schools if necessary.

Contrary to these theories, the Medds' schools were characterised by presenting an heterogeneous system whose parts had different physical and operational characteristics, but were also able to sustain different activities within the same range. They were spaces designed in terms of polarities, not for reading, woodworking or dancing, but for activities that required silence, the use of tools or free movement. This is how the adaptability of the Development Projects should be approached. Of course, this architectural strategy moved away from contemporary interventions where more flexible, more homogeneous spaces were proposed, such as Mies van der Rohe's Crown Hall (1950) which can be seen as a radical interpretation of the *flexible school without walls* idea, or the Smithson's Hunstanton school (1950), that still maintained the *same classroom for everything* as the school's basic unit. In a 1972 manuscript, filed under the title 'Primary Child School Design', David Medd insisted that flexibility or the *open-plan*²⁶ space were far from his overall strategy (as this would be the counterpoint to the idea of *built-in variety*), but he did mention it as the characteristic offered by the furniture that equipped the spaces.

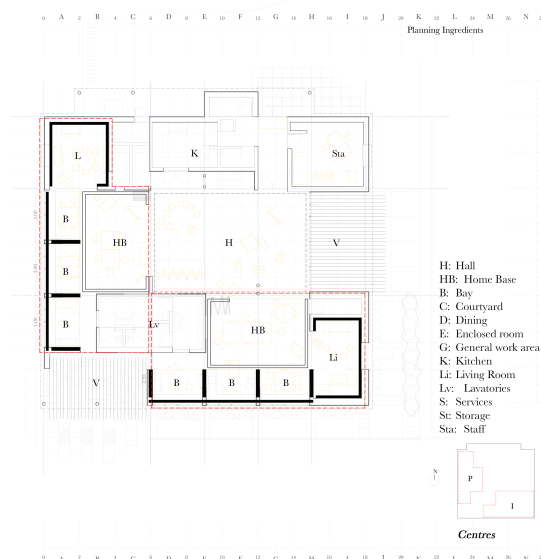
The 'schools without walls' slogan heralded a fashion which transformed the box classroom into a box school. This introduced larger spaces and more uniformity, instead of spaces for smaller groups and more variety. This is why so many feel uncomfortable in these schools, which derive from a dogma, not from experience of teachers working with children. The big box school with its wide perspectives heralds the new academicism with the sameness everywhere and its lack of variety. The term thermal envelope reflects the absence of human priorities. The big box school reflects an abstract concept of flexibility, not a real concept of variety. What is all important for all ages of children is to provide

*that which encourages personal relationships between children, and between children and teachers. For this the scale is small, but the range and work and activity is big, unpredictable and without limit.*²⁷

Roth's typological analysis of pre-war school designs, as well as a survey of the work of the Medds' closest contemporaries (e.g. Hunstanton School by Allison and Peter Smithson or the post-war schools by Herman Hertzberger, Aldo van Eyck, Hans Scharoun and Arne Jacobsen), prove that the *built-in-variety* strategy was an entirely original approach, deviating from both the *classroom-unit* concept, and the *open-plan* types that were being developed with flexibility in mind – as shown, David Medd himself literally rejected the 'box-classroom school' and the 'big-box school'. Therefore, if architectural references have to be found, these should be searched in domestic architecture (mostly British): the work of Charles Voysey, Baillie Scott, William Morris, Frank Lloyd Wright or Alvar Aalto, frequently mentioned by the Medds. Geraint Franklin has pointed out the affinities between the fluid handling of space in the Medds' designs and the houses designed by Baillie Scott and has indicated that their aesthetic preferences were closest to the English Arts and Crafts movement.²⁸ It is hardly surprising that the schools were conceived with homely environments in mind, since a school envisaged as an ensemble of different *Planning Ingredients* can be compared to a house envisaged as a sequence of different rooms.

The Development Projects: Finmere Primary School and Eveline Lowe Primary School

The plans of the schools built under these principles show that programmatic needs and functions were much more interwoven. Finmere Primary School,²⁹ built in 1958–59 by the Architects & Building Branch in collaboration with Oxfordshire County Council, was a village school where the Medds, along with Pat Tindale, applied the principles of the *Planning Ingredients* [11].



11 Plan of Finmere Primary School, Oxfordshire. Source: Authors' drawing.

In some brief notes written by David Medd in 1983, he stated that the design of this school stemmed from a particularly close collaboration with the advisers in the local education authority in order to promote the teaching practices they were encouraging.³⁰ This included the teacher Edith Moorhouse, who worked many years in Oxfordshire, had a very intimate relation with the Medds and wrote a personal brief about her experience as a teacher.³¹ The *built-in variety* was only possible with a deep understanding of what happens inside a school, provided by Mary Medd's extensive fieldwork and the continuous collaborations with teachers and educationists inside and outside the Ministry of Education.

Designs such as Finmere supported active learning, with freedom of movement, and enabled group work of different sizes. Moreover, Finmere is also an example of the use of the Hall as main space of the school and heart of the design, following Hertfordshire's early innovations. The main space, in the *Centre* of the plan, had room for 50 children. This *Centre* expanded towards the perimeter, first through intermediate spaces – home-bases for the two groups – and finally to the bay-windows. Each *Centre* – infant and junior – had its own private room, a living room and a library, which were divided from the home-base by means of a curtain. The practical bays were close to the verandas, considered outdoor teaching areas. Unlike the early Hertfordshire projects, here the school composed of a series of *classroom-units* disappears in favour of a richer, more complex interior, a two-*Centre* plan, full of specific and different learning opportunities.



12 Plan of Eveline Lowe Primary School. Source: Authors' drawing.

Another interesting school from the Development Projects period is Eveline Lowe Primary School. It was opened in 1966 and was designed to introduce some planning principles that had mainly evolved in suburban schools. The irregular shape of the site made it difficult to plan compactly but provided an opportunity

for developing different parts of the school with a degree of independent character, both inside and outside, appropriate to the various age-groups as they progressed through the school. The plan had eight different *Centres*, according to the age groups. The character of the interior was envisaged as being domestic, informal and varied, and furnished with a mixture of adult and children's furniture, including such items as rocking chairs, curtains, window seats and carpets. The whole school is divided into areas of accommodation for different groups, according to age. These groups have their own home-bases but also share smaller spaces. Groups B and D, for example are linked by an indoor space which can be used by small groups from both rooms, and also by a covered area [12]. Also, *Centres E and F* could at times even be regarded as one space, with a series of small group areas - some for more noisy and messy activities and some for quieter reading, writing and story-telling [13].

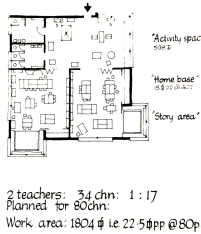


13 Interior of Eveline Lowe Primary School.
Source: Institute of Education, University College London.

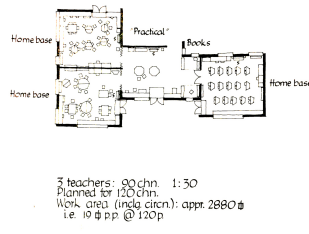
These are just two examples of the Development Projects that show a significant evolution from the schools built in Hertfordshire. As David Medd stated, variety should prevail in school plans, and open, flexible and undefined spaces tended to disappear [14]. In Finmere (1958) and Eveline Lowe (1966), but also in Woodside Junior School in Amersham (1957), Delf Hill in Bradford (1969) and Dderi y Ysgol in Wales (1976), all Development Projects directly involving the Medds, we can find the best examples of what Hertfordshire's experiment could contribute to the field of school design. As can be observed in the five layouts, the *Centres* do not repeat forming a series [15]. There is no repetition as a starting

principle, neither of *classrooms*, nor *classrooms-units*, but a definition of larger compounds (*Centres*) adjusted to the specificities of each group of students and teachers.

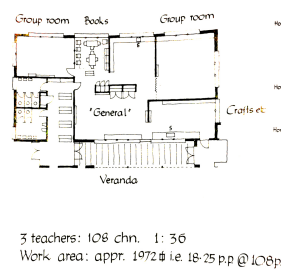
2 HOME GROUPS



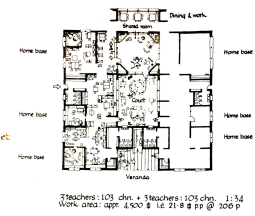
3 HOME GROUPS



HOME GROUPS



A PAIR OF 3 HOME GROUPS



14 Diagrams shown at Kings Manor at the Institute of Advanced Studies at York University on the 11th - 12th April 1972. (Medds' Collection ME/M/9/2).



15 Centres in Development Projects. From left to right/up and bottom:
 Woodside Junior School in Amersham (1957), Finmere Primary School (1958), Eveline Lowe (1966), Delf Hill in Bradford (1969) and Dderi Y Ysgol in Wales (1976).

Hertfordshire, expanding the limits of education

This survey of the period covered, from Hertfordshire after 1946 to the Development Projects from the 1950s onwards, has shown how post-war learning spaces were transformed by the members of the Development Group within the Ministry of Education. Setting aside construction innovations, the original contribution of the Hertfordshire school experiment was the focus on the plan (layout), supported by pre-war pedagogical innovations, as a means to affect and transform the act of learning. The Hertfordshire experiment built up a methodology – collaboration, research, prefabrication, cost limits etc. – that defined working principles, and has been well analysed by Saint and Maclure.

However, the Architects & Building Branch, with David and Mary Medd as acknowledged leaders, then took this work on and indicated a step forward as to what a school, spatially speaking, should be like. The new school layouts challenged the school model of traditional closed rooms and suggested a school made of *Centres* rather than *classrooms*. This change opened up an extensive field suggesting how architecture could actively contribute towards the transforming process. A planning methodology aiming for a *built-in variety* could have a real effect on education since, instead of neutral or flexible spaces, it encouraged a specific way of using the school in which the children would take an active role. However, that active role was not just a fanciful concept in which the content of teaching was unimportant. To the contrary, following the Hertfordshire and Architects & Building Branch designs, students, in their active movement inside schools, found spaces carefully designed with the curricula in mind, appropriate to their age and the specific contents to be learned. The schools were designed by teachers and architects together, without any sense of a single spatial unit (*classroom*) for learning of all kinds.

Nevertheless, this process should be framed within the period of the European Welfare State development, when architects, educationists and policymakers were all committed to the idea of progressive education. In the early 1980s, educational national policies were significantly altered, questioning the previous model and requiring a radical physical change of most of the schools designed by the Development Group. But the argument still prevails: whether to respond to progressive educational claims or to a more conventional curriculum, the spatial qualities of the schools had to be thoroughly adjusted to the pedagogic requirements. The Medds' contribution has to be seen as one of the most radical changes to educational architecture, an exploration of the relations between pedagogy and architecture to its latest consequences. That's why this case study shows how architecture can extend the limits of education, and vice versa.

Notes

1. David Leslie Medd, *A personal account. School design 1920's-1970's* (Unpublished document, Catherine Burke's personal collection, 2009), pp. 1–58.
2. Catherine Burke, *A life in architecture and education: Mary Beaumont Medd* (London: Ashgate Publishing, 2013).
3. Geraint Franklin, "'Built-in variety": David and Mary Medd and the Child-Centred Primary School, 1944–80', in *Architectural History*, 55 (2012), pp. 321–367.
4. Andrew Saint, *Towards a social architecture: the role of school-building in post-war England* (New Haven: Yale University Press, 1987).
5. Stuart Maclure, *Educational development and school building: aspects of public policy 1945-73* (Harlow: Longman, 1984).
6. The term *experiment*, referring to Hertfordshire's school design process, has been coined by the historian Andrew Saint, who points out that 'the philosophy from the outset was to begin with something which could gradually be turned into something better. [...] Prototypes were built not as ends in themselves, but as means towards a richer 'language' of school architecture. Always the architects learned from what had been done before'. It was indeed a short period of experimental design, which was extended beyond, into the later projects within the Ministry of Education. See Andrew Saint, *Not Buildings but a Method of Building...The achievement of the Post-War Hertfordshire School Building Programme* (Hertfordshire: Hertfordshire Publications, 1989), p. 7.
7. The architect Herman Hertzberger published the book *Space and Learning* that covers a wide scope about his work on educational architecture from the 1920s until today. The architect and historian Anne-Marie Châtelet has contributed to the field of educational architecture through her PhD thesis: *Les écoles primaires à Paris, 1870-1914: définition et élaboration d'un équipement* (Université de Strasbourg, 1991) and the book *L'école de plein air : Une expérience pédagogique et architecturale dans l'Europe du XXe siècle*.
8. Alfred Roth, *The New School* (Zurich: Girsberger, 1950), p. 42.
9. *Ibid.*, p. 44.
10. Hertfordshire County Council, *A Hundred New Schools: School Building 1948-1954* (Hertfordshire County Council, n.d.).
11. L.F. Gibbon, 'What happened in Herts', in *Education*, (27 November 1964), 977-978.
12. *Ibid.*
13. As pointed out by Malcolm Seaborne and Roy Lowe in *The English School. Its Architecture and Organization 1870-1970* (Vol. II. London: Routledge & Kegan Paul, 1978).
14. Medd, *A personal account*, pp. 1–58.
15. Guy Oddie, 'The New English Humanism: Prefabrication in its Social Context' in *Architectural Review*, (1963), 180–182 (p. 180).
16. Charles Herbert Aslin, 'On the design of Primary School', *The Architects' Journal*, (16 October 1947), 1–12. Medds' Collection, Institute of Education, UCL: DC/MA/B/1.
17. David Leslie Medd, Interview by Louise Brodie in 1998, transcription by Janice

- Richards in 2006, p. 149. Medds' Collection, Institute of Education, UCL: ME/B/1.
18. John Dewey was an American philosopher, psychologist, and educational reformer whose ideas have been influential in education and social reform. His philosophy, known as 'experimentalism' largely centred on human experience.
 19. Roth, *The New School*, p. 44.
 20. David Medd, 'Changes and Trends in School Design', Conference lecture: *Educational Conference* en St. John's College, Cambridge. (30th June–2nd July, 1972), pp. 1–20 (p. 10). Medds' Collection, IoE: ME/M/4/5.
 21. David Medd, 'Typed notes about two discussion groups which met at the Institute of Advanced Studies on 11–12 April 1972 and 8–9 January 1973'. (Unpublished, February 1972), pp. 1–38 (p. 1). Medds' Collection, IoE: ME/M/9/1.
 22. Ibid.
 23. Ibid.
 24. David Medd (Handwritten manuscript, no date), Medds' Collection, IoE, ME/M/5/4.
 25. David Medd, 'Attitudes and Trends in School Design', *Association of Organiser of School Meals in Scotland* (Edinburgh: not published, 1969), pp. 1–19 (p. 11). Medds' Collection, IoE: ME/M/4/5.
 26. The open-plan school type was probably an attempt to incorporate into educational architecture the same spatial strategies used for working environments (mostly office buildings) in the United States.
 27. David Medd, 'Trends in Education and School Design in Britain' (London: Architects & Building Branch. DES, 1973), pp. 1–15 (p. 14). Medds' Collection, IoE: ME/M/4/4.
 28. Franklin, "'Built-in variety": David and Mary Medd and the Child-Centred Primary School, 1944–80', p. 360.
 29. A detailed account of Finmere Primary School and its spatial strategies has been recently published: Paula Lacombe, Alejandro Campos, 'La disolución del aula: Finmere Primary School (1958-59), un aprendizaje integrador, específico y active [The dissolution of the classroom: Finmere Primary School (1958-59) by Mary and David Medd, an integrative, specific and active learning]', *Revista180*, 41 (2018), pp. 1–13. doi: 10.32995/rev180.Num-41.(2018).art-450.
 30. David Medd, Brief notes and a list of published references on each school (May 1983). Medds' Collection, IoE: ME/E/18/6.
 31. Edith Moorhouse, *A personal story of Oxfordshire Primary Schools 1956-1968*. (Unpublished, 1988). Medds' Collection, IoE: ME/Q/5/3.

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WEB ABSTRACT:

This paper reports on the primary school design processes carried out around the 1940s in the County of Hertfordshire in Great Britain, which lately evolved into innovative strategies developed by Mary and David Medd in the Ministry of Education from the late 1950s. The whole process, undertaken during more than three decades, reveals a way of breaking with the traditional spatial conception of a school. The survey of the period covered has allowed an in-depth understanding of how learning spaces could be transformed by challenging the conventional school model of closed rooms, suggesting a new way of understanding learning spaces as a group of *Centres* rather than *classrooms*. Historians have thoroughly shown the ample scope of this process, which involved many professionals, fostering a true cross-disciplinary endeavour where the curriculum and the learning spaces were developed in close collaboration. A selection of schools built in the county has been used to typologically analyse how architectural changes began to arise and later

flourished at the Ministry of Education. The Medds had indeed a significant role through the development of a design process known as the *Built-in variety* and the *Planning Ingredients*. A couple of examples will clarify some of these strategies, revealing how the design of educational space could successfully respond to an active way of learning.

Keywords: primary schools, post-war architecture, Development Projects, educational architecture.