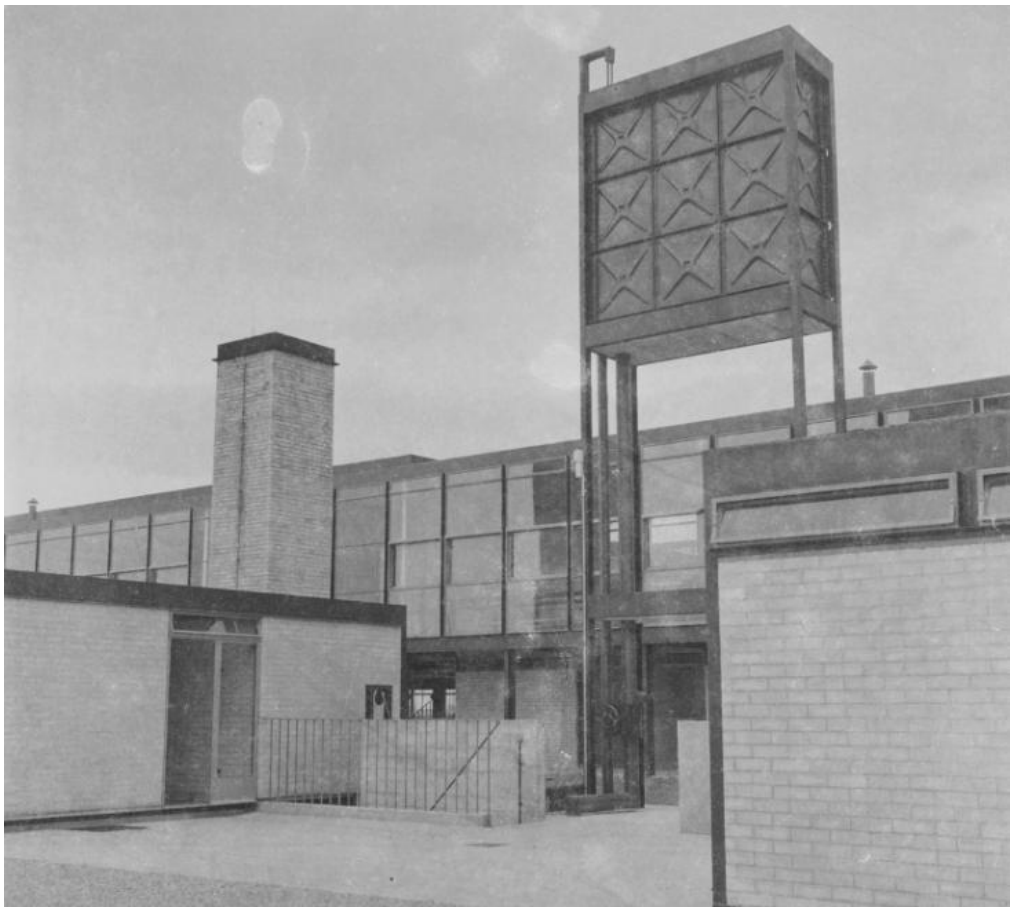
The School of Hunstanton, too simple or pleasant?

The position of the Hunstanton School in the architectural debate



History Thesis

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Contents

Abstract

This thesis examines and describes the position of the Hunstanton School in the architectural debate. The position of the school of Hunstanton has been examined through outlining the historical context, the philosophy of the architects, an analysis of its design and construction, and finally by highlighting the different opinions of critics. This research uses archival material of old interviews with, and writings from the architects and critics. The position of the School of Hunstanton in the architectural debate of the post-war period is mainly determined by its contrast with the Hertfordshire Schools. This was due to the fact both buildings stood for something that was part of a broader public debate over the role of architecture under the Welfare State: Hertfordshire for only taking flexible building system and well-being of children into account and Hunstanton for not subjecting architecture to political concerns. This contradiction in the architectural debate affected the way in which Hunstanton was viewed, namely either as a functional school building or as an architectural statement.

Introduction

The school of Hunstanton is built in the post-war period in England. During this period a progressive ideology as emanating from an increased concern by the state for heath of the population and the flowering of a child-centred pedagogy with long-term antecedents arose (Lowe, 1988). Due to the strong birth rate and scarcity of materials after the war, construction had to be done quickly and cheaply. This combined with the government's high ambition for good and healthy education conditions meant that simple efficient designs were needed.

The Hunstanton School stood out for its extraordinary austerity, strict budget and formal clarity. It expressed the desire of the architects, Alison and Peter Smithson, to reveal the essentials of the structure and the materials used. This simplicity and formal clarity was completely different from what was common in England with buildings where comfort and educational needs were the main focus. The work of the Smithsons was later qualified under New Brutalism (The Open University, 2001) This style was popular among architects, but later people found it too distant.

One can wonder if this minimalist style is appropriate for a school building. In addition to the school having to be functional, it should a place where children feel comfortable. The simplicity that the Hunstanton School exudes may not radiate the comfortable feeling like other examples of post-war schools. This raises the question of whether the architects have given themselves too strict guidelines to comply with simplicity. That the architecture had to speak more than that the building had to be a functional school building. These questions have been extensively explored through various publications in architecture journals and books, which were part of the architectural debate of the post--war period and beyond.

This paper is an extensive research on the different perspectives about Hunstanton. The research question is therefore: What was the position of the School of Hunstanton in the architectural debate?

The following chapters will highlight the issue in various ways;

1. Architecture philosophy of the post-war period
2. Architecture philosophy of the architects
3. Analysis of the school of Hunstanton
4. What did critics say

These chapters are based on the research of use archival material of old interviews with, and writings from the architects and critics. For example the book 'Towards a Social Architecutre, the role of school-building in post-war England', of Andrew Saint (1987), and the article 'The New Brutalism' , of Reyner Benham (1955) are used as an important source and inspiration. These historians and researchers look at post-war architecture from a different perspective. Saint focuses on social & functional philosophy behind architecture and Banham focuses more on aesthetic philosophy of architecture. In this thesis both aspects will be weighed against each other, but also connected to each other.

The connection between different perspective is important to create good and balanced architecture. Today we are facing a similar situation as in the post--war period. We need to find a solution to the great housing shortage (Jefferys & Griffith, 2013). As architects and as a society it is an aspiration to build good architecture and comfortable housing, but there are limits to time, money and also environmental resources. Therefore is the school of Hunstanton a good historic example to include into todays discussions and learn from.

1. Architecture philosophy of the post-war period

Rebuilding through standardization in construction

After the Second World War there was a huge demand for new buildings due to wear and tear, destruction caused by war, the fact that all normal construction had stopped during the war a nd that there was a huge population growth in the post-war period. All of England had to be rebuilt and this had to be done quickly and cheaply.

With traditional building methods there were two options; either they built only a small number with the money and materials they had, or they accepted smaller spaces and poorer quality. A better simpler construction method was much needed. This however meant that fundamentally much had to change (Saint, 1987, p.250).

There used to be a lot of cheap skilled laborers who built buildings from small parts by hand. Industrialization did manufacture various fixtures, such as sinks, railings, and windows, but the large building elements were still made on site by manpower. Only recently the labour costs for skilled on-site labour had become much higher, and even worse the number was extremely scarce (Saint, 1987, p.251). So there was a future in standardization in construction, which would make building faster, but also simpler.

However, changing traditional construction to more standard practice was not so easy. Standardization in construction was difficult to achieve in private projects. As a private developer you did not have much interest in a standardized construction. Construction parts were only needed a limited number of times, so it was not economically convenient or feasible to have standardized construction elements produced. The motivation to change this had to come from large institutional projects. When there was a need for a large numbers of buildings of similar type such as health centres, hospitals or schools, local authorities could plan ahead and know in advance which and how much similar construction elements are needed (Saint, 1987, p.253).

To do this a strong government was needed. The Labour party won the election in 1945 with as main theme of social welfare. With the Labour party in power the Welfare State, who focussed on housing, health and education, arose. It was their priority to build a large amount of new schools, hospitals and houses (Bianco, 2013, p.73-74). To do this standardisation was not a choice, but a need. Standardization was necessary to integrate the shortages of the post-war years with the demands of the period (Saint, 1987, p.232).

The Welfare State

The 1944 Education Act and the 1946 New Towns Act were a major impulse for the emergence of the Welfare State in Britain, which in its turn were mainly responsible for post-war social reconstruction. The Education Act led to the construction of 2,500 schools within a decade, and the New Towns Act led to the planning of ten new towns based on the model of Letchworth Garden

City (Frampton, 1994, p. 262). The National Health Act of 1947 amplified the impact of the former Acts. Aneurin Bevan, who devised the Act when he was then Minister of Health, proclaimed that "homes, health, education and social security, these are your birth right" (Briggs, 1973, p.513). This social restructuring provided the setting for the British post-war school building movement, which later became (along with equally ambitious efforts in Denmark) a model status for other European social democracies (Grafe, 1998, p.70).

However, before it became a model for other countries, Britain itself had to undertake a clear shift from emphasis on aesthetics to ethics (Mordaunt Crook, 1989, p.256-257). Architecture played an active role in a cultural and political agenda of the Welfare State. The description of this agenda was as clear as it was pronounced: modern architecture was a means of achieving minimum standards for every individual, regardless of their social position (Grafe, 1998, p.67).

Child-centred architecture

The emergence of the British Welfare State meant that there was a great deal of focus on the architecture of school buildings. There has been no other period in which the architecture of childhood has featured so prominently in architectural journals, exhibitions, or historical retrospectives. British architectural journals devoted numerous special issues to the planning of school buildings, in stark contrast to the interwar period, when this building type received little attention (Kozlovsky, 2013, p.1).

Child-centred architecture had emerged due to focus on the wellbeing of children in education by the 1944 Education Act. Which, according to Tomlinson, in its turn arose "out of the new conception of Education which was gaining ground before the war and designed to promote and encourage development of that conception" (RIBA, 1948, p.2). The introduction of the Act placed the child at the centre of the educational system. It was designed to meet the developmental and educational interests of the child. For example, the sizes of the classes were reduced to enable better social interaction. Classes that had 40 to 50 pupils were "not education but mass production" (RIBA, 1948, p.5).

Post-war school architecture aimed at the social dimension of education in a more contented and humane environment. School buildings should be light and healthy and "must express, in architectural form, the culture which is the basis of our society" (RIBA, 1948, p.28). And the culture upon which post-war society was based was no longer the same as when 19th century schools were built. In the nineteenth century, discipline was more or less synonymous with proper care. This education method was literally reflected in the systematically punched holes in the massive school façades, which is primarily intended to be a showcase for order and discipline. However, gradually the concept of care had evolved from order and discipline to openness and homeliness. This resulted in classrooms that sought contact with the outside world. Light became associated with hygiene and resourcefulness. The size of the windows became a measure of the school's commitment to the development of the child, and so the school facade evolved into larger and larger panes (Vanmeirhaeghe, 2007, p.19-20).

The Hertfordshire County Architects Department

The combination of the great scarcity of materials to build the necessary schools and the new perspective on education and educational buildings meant that modernizing school buildings was needed, and this challenge was taken by the Hertfordshire County Council. Hertfordshire County Council had to build new schools for their growing population, which increased by 50 percent from the '30s to the '50s (Maclure, 1984, p.39). The architects at the County Council collaborate with educational officers and teachers as well as with the building industry. They tried to implement progressive educational methods with a prefabricated building system. This system was made out of lightweight components, which could be assembled into various grid-based plans. In the end they build fifty schools by applying the same construction system, while they never repeated the same plan (Kozlovsky, 2013, p.97).

The expertise developed at the Hertfordshire County Architects Department was institutionalized through the activities of the Architects and Building Branch (A&B Branch) of the recently founded Ministry of Education. Under the leadership of Stirrat Johnson-Marshall and David Medd from Hertfordshire, the A&B Branch kept developing innovative school building methods and spread this knowledge through publications such as the widely circulated and read Building Bulletins series. As a result, the A&B Branch dominated the post-war architectural debate and influenced the architecture of English schools. Besides being a model for modernizing architectural production, it was also a subject of controversy. During the '50s the schools of Hertfordshire were contrasted with the School of Hunstanton (Kozlovsky, 2013, p.97-98).

The School of Hunstanton became part of the architectural debate even before its completion. The Architect's Journal devoted two issues to School of Hunstanton. Its design divergence by not having an informal plan as the Hertfordshire schools and by making the articulation of steel frame technology into a coherent architectural language (Kozlovsky, 2013, p.99). The architects, Alison and Peter Smithson, even presented their design as a counter-thesis to Hertfordshire: "Our project is an attempt to carry the design of school beyond the diagrammatic stage into a work of architecture, and its form is dictated by a close study of educational needs and purely formal requirements" (Builder, 1950, p.644).

2. Architecture philosophy of the architects

Winning the competition

Alison and Peter Smithson (figure 1) won the competition to design the School of Hunstanton in 1950. At the time Peter was only 26 and Alison, a mere 21 years old, just graduated from the architecture program at Durham University. They had been working for the Schools Division of the London County Council since 1949, so winning a competition, with less than one year of working experience, came as an surprise (Parnell, 2012). As Peter Smithson described: "We were just children, as it were, straight out of school". Despite their youth, there was no hassle with the client, which surprised Peter because from the client's perspective, they were taking a huge risk with hiring young architects with no building experience (Smithson & Carolin, 1997, p.39).

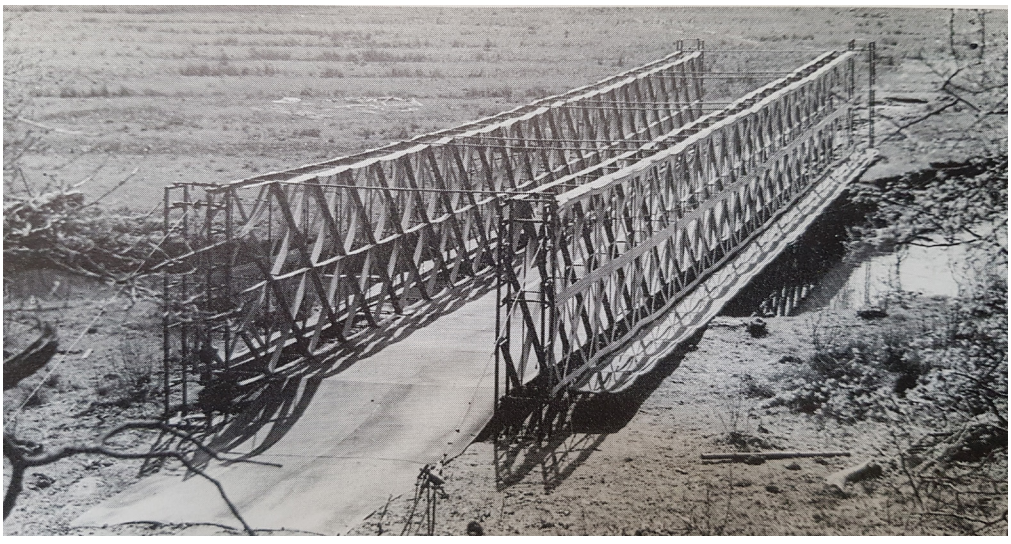
1. Photograph of Alison and Peter Smithson at 32 Daunty Street: London, in the fifties

By winning the competition, Alison and Peter Smithson gained much prominence in architecture. Their design of the School of Hunstanton was triumphantly received on the stage of international architectural debates. The attention that the School of Hunstanton had focused on them made it possible for the couple to establish an independent architectural firm (Stierli, 2010, p.154).

The Bailey Bridges

Peter Smithson started at the Architecture school in New Castle at a very young age, 16. He quit his studies in 1942 to join the army. There he got to know all about carrying and assembling Bailey Bridges (figure 2). During the war he discovers in his words: *"my affection for the simplicity and directness of the Bailey Bridge."* (Smithson & Carolin, 1997, p.32).

He found details of Mies and the Hertfordshire schools to studied. He gave the example of Alvar Aalto saying his module was 'A millimetre of less'. The Smithsons' concern was with appropriateness – they believed that a consonance would arrive if things were sized for their function: a relationship of fitness. *"I have always related that back to the Bailey Bridges in which all the components had to be sized to be carried by men and the bridge had to be self-launching – it was all about operation rather than mechanics. Architecture also is operational."* (Smithson & Carolin, 1997, p.36).

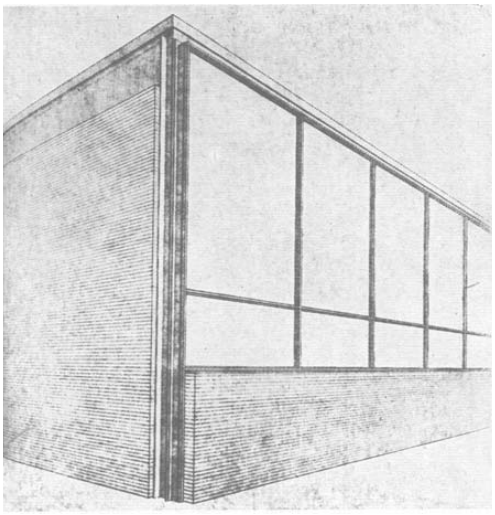


2. A demountable Bailey Bridge, as encountered by Peter Smithson in the army.

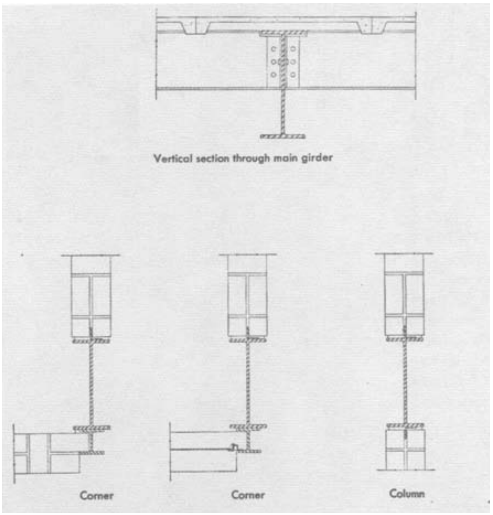
Mies van der Rohe

A great inspiration for the Smithsons' was Mies van der Rohe. The Smithsons' design was based greatly on the architecture of Mies, whose importance they were more than happy to acknowledge for their debut work (Stierli, 2010, p.155). Peter Smithson stated that when designing the School of Hunstanton they were consciously attempting to simplify or distil Mies: "*[what] we wanted to find out was how to use Mies' methods without any mannerisms*" (Cook, 1982, p.37).

During an earlier project on the Fitzwilliam Museum Peter followed Mies, in his own words, in a student way. He received the tearsheets from The Architects' Journal (1946), which Alison had sent him, with details of a small building by Mies van der Rohe at the Illinois Institute of Technology in Chicago (figure 3). The Architects' Journal published pages out of Philip Johnson's book on Mies van der Rohe (figure 4) (Smithson & Carolin, 1997, p.35).



3. Library and Administration Building, IIT; corner perspective. This was on one of the AJ tear-sheets sent by Alison to Peter Smithson.



4. Minerals and Metals Research Building, IIT; details as illustrated in Philip Johnson's book.

Alison Smithson sent Peter the tearsheats because, as she had said, they 'meant nothing to me' and she knew that Peter already was in possession of Johnson's book 'The first on Mies?', which was published in 1947. The book contained images of steel details. The format in which it was published was important, because with the internal and external photographs and the typical details, you could follow how the architecture had been established (Smithson & Carolin, 1997, p.35).

The Hunstanton design was based on the image of Mies van der Rohe's architecture, rather than to the build projects, for the Smithsons had not had the chance to visit any of Mies's completed buildings. This was due to the fact that most students at the time did not have much to spend, and even at London County Council there was no budget for the Smithsons to go abroad. Well into the 1950s, the post-war years, there was an economy of scarcity in England, which in this case meant that there were limited budgets available for public employees to travel foreign. For many young British architects, it was not possible to travel to Germany or the United States, where they could study Mies van der Rohe's architecture on site (Stierli, 2010, p.155).

The importance of the 'image'

Since there was no opportunity to visit projects in person for the purpose of studying them, information was disseminated through books and published images. As a result, the importance of the image in communication and marketing increased. This was a phenomenon that took place not only in architecture but also in various other fields (Zimmerman, 2012, p.271).

The Smithsons were aware that the commercial aspects of architecture also applied to them. In the reflection on Hunstanton Peter Smithson indicates that they found it important to spread their work in the way it was done with the work of Mies van der Rohe; "*Subsequently, in the publication of our own work, we followed the same method because sometimes someone else tries to follow in your steps.*" (Smithson & Carolin, 1997, p.35).

They knew that the way information circulated about new buildings would certainly influence later building. Architectural photography and its networks influenced the design of buildings, and architects were navigating changes in commercial culture through the buildings themselves (Zimmerman, 2012, p.272). Just as the Smithsons drew information from the photographs of Mies' building, others likely did so in turn with their work.

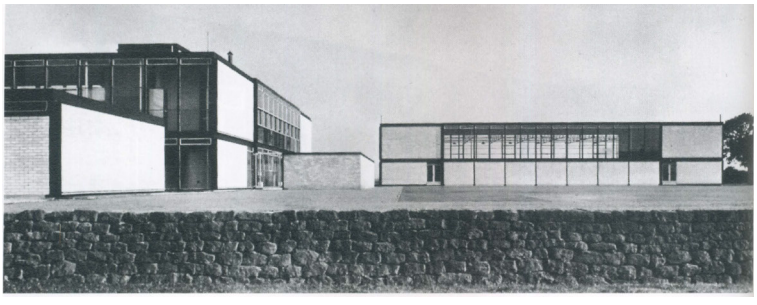
3. Analyses of the School of Hunstanton

The site

The school is located just outside the seaside town of Hunstanton, on the main road leading to King's Lynn. The site is a rectangle of 22 acres, bounded on the west by the main road and on the north by a secondary road. As Peter Smithson described *"The site itself was a flat field with a scrappy hedge – it didn't produce much of a visceral response."* (figure 5) (Smithson & Carolin, 1997, p.36). It is surrounded by hedges and some small trees, although there are none on the property itself. The land slopes about 1 in 260 from west to east in the building area and about 1 in 330-400 from north to south, with nice views of the country scenery to the south (Johnson, 1954).

5. Photograph showing the site and exterior of Hunstanton Secondary Modern School, Norfolk, during construction

With this landscape at the background, the ordered, long two-storey volume of the school exhibits a self-assuredness, which makes it a self-contained object that takes little notice of its surroundings (Grafe, 1998, p.71). The building and its surrounding paths and play areas does not follow the slope. They stand on a flat platform of approximately 240 feet by 600 feet, which starts at ground level on the west side and ending 2 feet 3 inches above the existing ground level on the east side. Along the north side, with the exception of the entrance and parking lot, there is a ha-ha (figure 6) and at the south is a bank at a slope (Bullivant, 1953, p.238).



6. Ha-ha at the site of the Hunstanton School

The introduction of the New Brutalism

The way the School of Hunstanton is constructed is simple; it is constructed in the same way as it appears. The buildings of the Modernist movement on the other hand appear to be made from whitewash or patent glazing but, in reality, are more often brick or concrete. The school of Hunstanton is sincere about its construction. The building seems to be made of glass, brick and concrete and is, in fact, made of those materials. It is therefore no surprise that the Smithsons indicated an escape from Modernism and, with the School of Hunstanton, brought the New Brutalism to life (Banham, 1955).

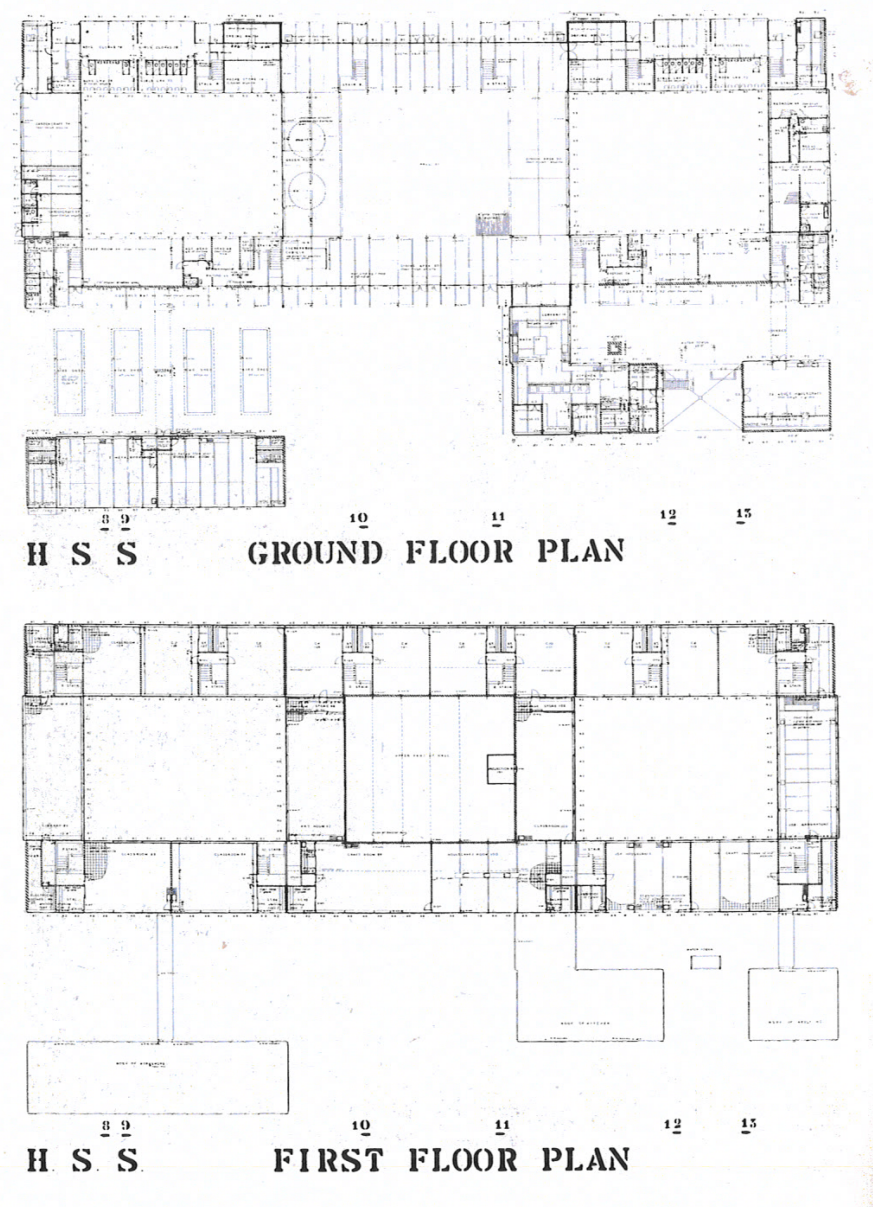
This terminology was first used by Reyner Banham. He saw the School of Hunstanton as the first New Brutalist building (Grafe, 1998, p.69). In the manifesto 'Without Rhetoric' of Alison and Peter Smithson, they express that *"It is this respect for materials – a realisation of the affinity which can be established between building and man – which was at the root of our way of seeing and thinking about things that we called New Brutalism."* (Smithson & Smithson, 1973).

Reyner Banham (1955) wrote that the New Brutalism movement's three primary characteristics were "Memorability as an Image", "Clear exhibition of Structure", and "Valuation of Material 'as found'". As explained in "about the importance of the 'image'" in the previous chapter, was the image an important medium for the architects to gain and spread information about architecture. Their friend and photographer Nigel Henderson took pictures of the School of Hunstanton just after the completion, which gave a poignant illustration of the architects' intentions. The architects knew that to make the building memorable, the image should illustrate the architects' intentions and so requested Henderson to photograph the building without furniture (Grafe, 1998, p.73). The other two characteristics that Banham described: "Clear exhibition of Structure", and "Valuation of Material 'as found'" are integrated in the design of Hunstanton and are reflected in the structure of the plan, facade, construction and services. This will be discussed in more detail in the following paragraphs.

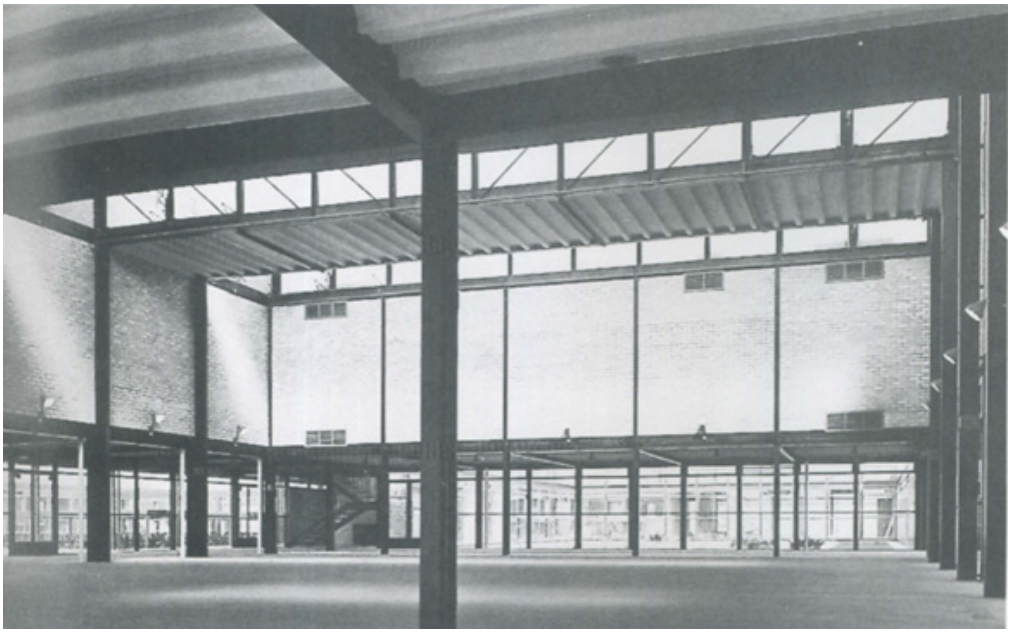
The plan

The floor plans of the main block are built around two central symmetry axes, the various naves and transepts are repeated at the same width and in an identical template (figure 7) (Vanmeirhaeghe, 2007, p.17). This 'main block', which is a long rectangle about 290 feet by 103 feet with two inner courtyards which are 52 feet by 72 feet, contains all the accommodation except the gymnasium with its changing rooms, the wood and metal workshops, the kitchen, the adult housecraft room and the boiler-house. These annex buildings depart from the symmetry of the main building (Johnson, 1954).

The organization of the building is ordered and straightforward. The two inner courtyards are on either side of the double-height hall, separated by glass partitions that follow the dimensional system of the surrounding facades. The middle part of the ground floor is left open. There are dining areas on either side of the multipurpose hall (figure 8) In the outer naves and transepts, that enclose the courtyards, are the offices for administration and ancillary rooms (Grafe, 1998, p.72).



7. Plan of the School of Hunstanton



8. Interior of the main hall of the School of Hunstanton

The inner courtyards have the function of providing light and air to the school. It is not the intention that the children will engage in the courtyards. They are designed as silent gardens and therefore no doors open to this internal outdoor space (Vanmeirhaeghe, 2007, p.17).

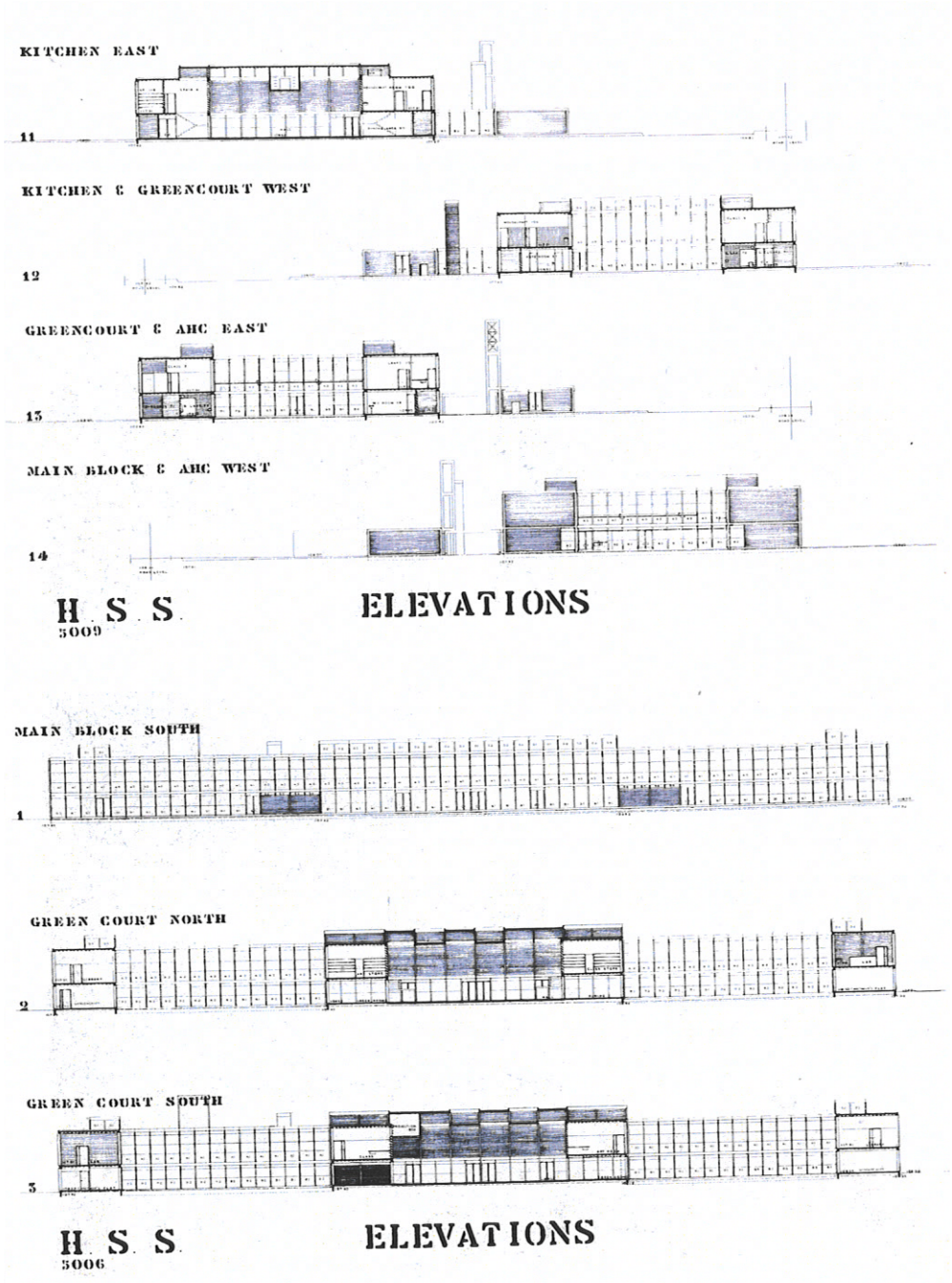
The upper floor is totally reserved for mainly classrooms and other learning spaces as workshops and the library. The workshops and library can be found in the four identical transepts, that are situated between the two longitudinal batteries of classroom wings. The classrooms are linked in pairs and accessed by stairs on the upper floor (figure 9). This stood out because normally classrooms were connected by a long corridor (Vanmeirhaeghe, 2007, p.17). The explanation of Peter Smithson for this particular set-up is written in Reflections on Hunstanton: "The core of the school is the assembly hall which flows freely into the dining areas and entrance areas, carrying into the school the planes of the forecourt, the green courts and the playing fields. This grouping allows the circulations of the hall, the dining areas and the school generally to be superimposed, resulting in a compact and economical plan; on the first floor it is impossible to be more than 25 feet from a stair escape." (Smithson & Carolin, 1997, p.38).

9. Photograph showing staircases at Hunstanton Secondary Modern School

The facade

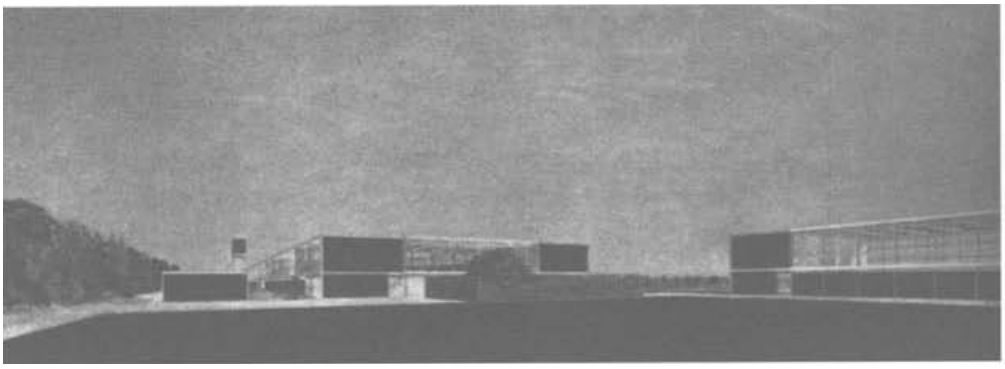
The facade is composed of rough brownish yellow brick, steel frames and glass. The formal structure of the facade, formed by the fine vertical and horizontal lines of the slender steel profiles, and the carefully proportioned brick surfaces, make the building a defined object (figure 10) (Grafe, 1998, p.71).

This new design was seen as revolutionary and wanted to break with the nineteenth-century school facades. The design of Hunstanton School originated from a concept *"dictated by a close study of educational needs and purely formal requirements rather than by precedent"* (Smithson & Carolin, 1997, p.38). And as already explained in the first chapter the educational needs had changed to more openness and homeliness. The closed and monumental facades, with their regular row of window openings, gave way for an almost completely transparent construction made of a steel truss filled in with glass. The transparent facade gave the pupils a view of the surroundings and allow the outsiders to have an insight into the school. They can see the ceaseless flow of activity behind the school façade, and the interior with series of sinks and pipes against glass background (Vanmeirhaeghe, 2007, p.16).

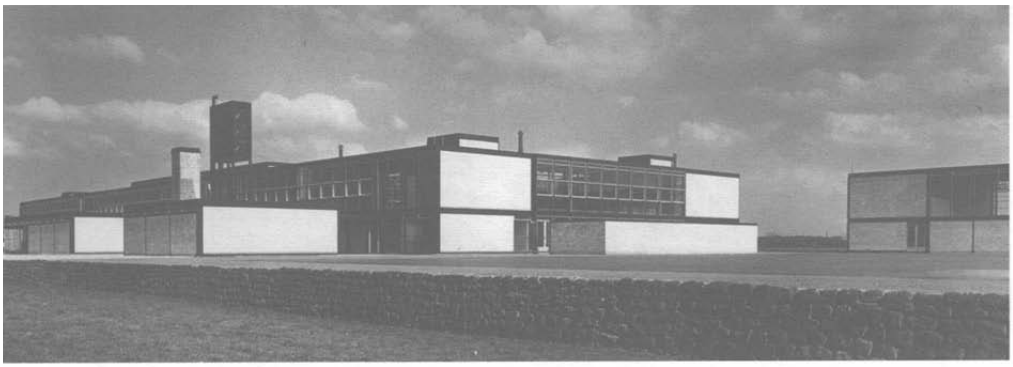


10. Elevations of the School of Hunstanton

For the closed parts of the facade, the competition design had intended silver paint for the steel frames and dark plum-coloured brick infill panels. Within the building budget for the School of Hunstanton this sort of brick was not available, so the architects chose a Cambridge gault brick instead. So the design was reversed from light steelwork (silver) and dark panels (plum-coloured) (figure 11) to dark steelwork (black) light panels (yellowish-white) (figure 12) (Smithson & Carolin, 1997, p.40).



11. Post-competition perspective. The steelwork was silver coloured and the brickwork dark plum.

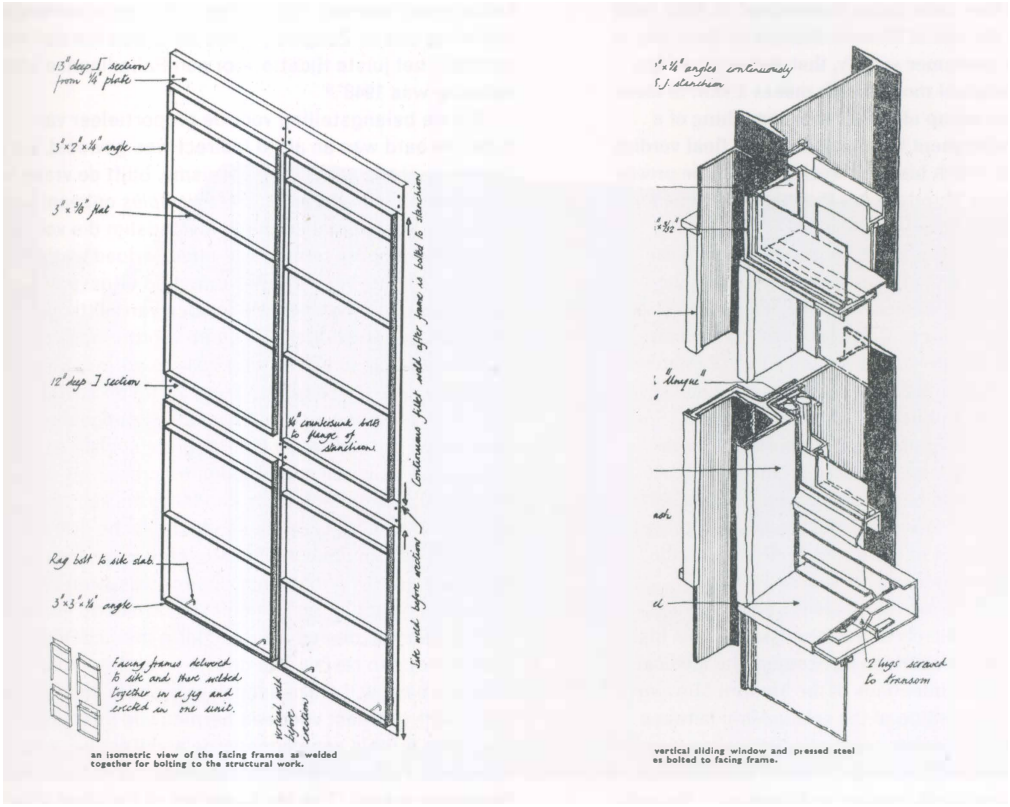


12. Hunstanton School as completed with black steelwork and yellow-white brickwork.

The fact that a different brick had to be chosen illustrates well that the architects had to deal with the scarcity of materials. The statement of Peter Smithson *"The materials, whether the precast slabs, the Braithwaite water tank and the light fittings, were 'as found'. We were making a composition out of common existing components rather than designing them."* illustrates what their method was of dealing with scarce materials. The architects did not believe in the system of large standard elements, because they found it too inflexible. Instead, they assembled existing components from families-of-components which were already available in industry, such as steel sections, bricks, etc, into architecturally finite elements, where each part was indispensable structurally and architecturally (Smithson & Carolin, 1997, p.39-40). Again, they used the materials 'as found' so they did not waste additional scarce material on finishing.

They tried to use all material as assembled to serve structural purposes whatever other purpose they serve. For example the steel mullions and transoms of the windows are constructive elements and at the same time eliminate the glazing sub-frames (Smithson & Carolin, 1997, p.38-39). These pre-welded steel frames (figure 13) are part of the primary structure and are calculated according to the plastic theory. The plastic theory is a method for calculating structural dimensions, aimed at achieving extreme economy of the material.

This also applies to secondary construction elements such as the brick panels, which stiffen the frame-though (Grafe, 1998, p.73). The brick panels preform structurally, but also functionally, by providing blank walls internally, and decoratively, by setting off the glass visually. By melting all these different qualities together, the architects made all elements as parts of an integrated architecture (Johnson, 1954).



13. Isometric view of facing frames as welded together for bolting to the structural work (left) & Detail vertical sliding window (right)

The construction

The School of Hunstanton was built between 1951-1954. The construction took so long because the school used Norfolk County Council's entire steel allocation until the end of steel rationing in May 1953 (Parnell, 2012). This was very remarkable since the simplicity of construction and lack of finishes should ensure that, on the contrary of what happened, construction could take place quickly. Even though steel shortages at the time did not allow for rapid construction, the building has become a blueprint for later school construction in England and may well be abroad (The Open University, 2001).

However, when the steel finally arrived, they could start fabricating the structural framework. This fabrication was done on site, by welding the beams and stanchions of rolled steel section into frames. To be able to do all the welding by hand, a jig was specially designed in order to allow for each frame to be turned upside down. The finished frame was then lifted by a caterpillar crane, moved to its location on the building site and bolted in place. With temporary ties and braces, it was then held in place until corner joints could be welded at eaves and floor level. At the internal corners, where the structural framework changes direction, two stanchions were used. These two stanchions were join-

ed together and sealed by an angle welded to both (Johnson, 1954).

When the beams and stanchions were delivered on site they were already painted with a coat of aluminium. After they were welded together, they were touched up with the aluminium paint. After construction, a coat of red lead primer was applied all over the frames, then an undercoat of black bitumen paint, and at last both inside and out by a final coat (Johnson, 1954).

The steel frameworks were mostly filled with glass (figure 14). The south and west facades were single glazed, and the north and east facades were double glazed. Vertical and horizontal sliding windows were specially designed for the School of Hunstanton. The closed parts of the facades were filled with panels of yellow gault bricks. These walls are of two layers of bricks, of which the internal and external facing skins were painted with two coats of thick bitumen paint. Where the brickwork meets with steel frames, vertical and horizontal reinforcement is used and attached to the steel with bolts and washers. In places where the brickwork needed to be trimmed around steel elements, a small circular saw bench with a 1/8-inch carborundum cutting wheel was required (Johnson, 1954).

The floors of the school are constructed of 16 inches wide and 4 inches deep pre-stressed concrete floor slabs. The floor slabs rest on cleats, which are welded to the steel beams (figure 15). Where necessary, the panels are covered with a half-inch layer of insulation. Panel heating coils are laid on top of this and the entire structure is then covered with screed. The floor finish varies from room to room depending on the function. The floors of the classrooms and workshops (metalworking as an exception, which has granolithic floors) are finished with plastic tiles. The circulation areas and kitchen have terrazzo floors. The mail hall and gymnasium are covered with wood strips, and the staff rooms with linoleum (Johnson, 1954).

14. Photograph showing the glass placed in the steel frames of Hunstanton Secondary Modern School.

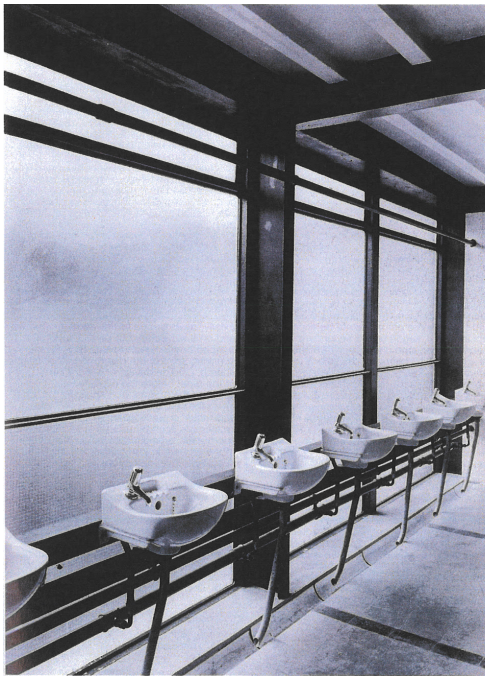
15. Photograph showing the construction of Hunstanton Secondary Modern School.

The services

The Smithsons did all the working drawings by themselves as they were taught in school, which also included the plumbing and drainage. The only exception were the subcontractors who designed the mechanical services (Smithson & Carolin, 1997, p.39). The services contribute to the architectural

appearance of the school and often disturb the formal composition of the façade. For example, the water tower (figure 16), the chimney and the kitchens all stand asymmetrically in front of the symmetrical façade (Johnson, 1954). Also the services of a smaller scale contribute to the 'image' of the building. People can see of what Hunstanton is made and how it works. Water and electricity do not come from inexplicable holes in the wall but are brought to the place of use by exposed pipes and conduits (figures 17&18) (Banham, 1955).

16. Photograph showing the water tower of the School of Hunstanton



17. Photograph showing the exposed water pipes in the School of Hunstanton

18. Photograph showing the exposed ducts in the School of Hunstanton

The school's space heating is provided by a low-pressure, accelerated hot water system with cast-iron boilers and automatic under-feed mechanical heating devices, using bituminous coal as fuel. The main piping runs in a reinforced concrete channel under the floor, with corrugated iron sheets as permanent shuttering for the floor slab above (Johnson, 1954).

On the first floor the classrooms and the adjoining storage rooms are heated by built-in copper pipe panels. These panels also provide some heat to the classrooms on the ground floor. The classrooms where this heat is not sufficient will be further heated by convectors and pipe coils on a two-pipe system. In all classrooms on the first floor, except spaces facing south and spaces facing east and west with only one outside wall, the pipe coils of the high temperature circuit are attached at a low height beneath the windows in order to prevent draughts downwards (Johnson, 1954).

There is no heat from the ceiling in the gymnasium, workshops, kitchen and adult house craft rooms, so in these spaces the entire heating demand is covered by convectors and pipe coils. The pipe circuit that supplies the convectors and pipe coils is a high-temperature circuit that has a maximum boiler temperature of 180 degrees Fahrenheit. This circuit also serves the local hot water storage tank. In the main hall and the gymnasium four forced-flow convectors are used to heat the relatively big spaces. These convectors are controlled by a thermostat. The piping in the main hall has been arranged in such a way that fresh air can be drawn in during the summer (Johnson, 1954).

When designing the heating pipe circuit the separate coils were supposed to have an equal friction resistance not exceeding 7 feet, so as to give an even heat output, but economical piping was taken into account and cutting lengths of more than 15 feet were used again. Another method to save money and energy was the time switch to change over to a night setting. This setting was designed to switch the heating system to approximately 50 percent day load during the weekends. To extend the day or night mode, there are also manually operated valves (Johnson, 1954).

4. What did critics say

The post-war architectural debate

After the war there was a sense that society was at nexus, that the post-war generation was in command of the future, and that it was the responsibility of young intellectuals, professionals, and politicians to tackle the challenge of rebuilding the country. *"The war seems to have had the psychological effect of cleaning, of wiping away the old world and offering the opportunity to create a better and new society."* Architects felt that they were one of the important groups who should be responsible for creating the future of society. The debate was divided; mainly between the student generation - many of whom were in their mid-twenties, having interrupted or postponed their education due to the war and the practicing "established" architects (Smithson & Webster, 1997, p.13-14).

Etiquette dictated that the debate should be carried out in architecture journals such as the Architectural Review, Architectural Design and the Architects' Journal. The Hunstanton School of the Smithsons had become famous in architectural circles in the early 1950s after winning the competition to build Hunstanton School and was published in Architectural Design in September 1953. The Smithsons themselves were participating in the architectural debate and later wrote essays for Architectural Design. The school of Hunstanton was also published in the Architectural Review and the Architect's Journal (Parnell, 2011).

Contrasting the Hertfordshire schools and the School of Hunstanton became an important issue in the architectural debate during the 50's. This was due to the fact they both stood for something that was part of a broader public debate over the role of architecture under the Welfare State: Hertfordshire for only taking flexible building system and well-being of children into account and Hunstanton for not subjecting architecture to political concerns (Kozlovsky, 2013, p.98-100). This contradiction in the architectural debate affected the way in which Hunstanton was viewed, namely either as a functional school building or as an architectural statement.

Hunstanton as a functional school building

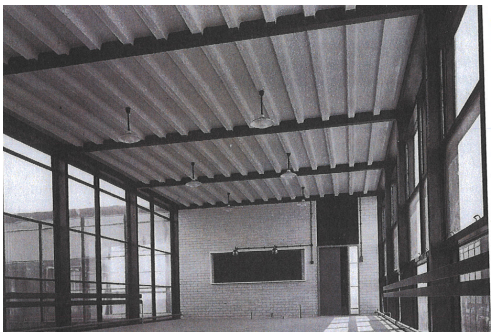
The Architects' Journal appraised the Hunstanton school before and after its completion. As well did the leader of September 1954 by Colin Boyne, who began flatteringly on the planning and detailing, but then it lashed out:
"in that this building seems often to ignore the children for which it was built, it is hard to define it as architecture at all. It is a formalist structure which will please only the architects, and a small coterie concerned more with satisfying their personal design sense than with achieving a humanist, functional architecture. It is likely to prove an expensive venture into blind alley." (Boyne, 1954, p.336).

Boyne blamed the architects for not putting a single piece of material anywhere in the building. He described an endless list of all hard materials in the assembly hall and the classrooms: gault brick walls, the exposed RSJs, the exposed rough pre-cast concrete floor units painted white, the troughed asbestos

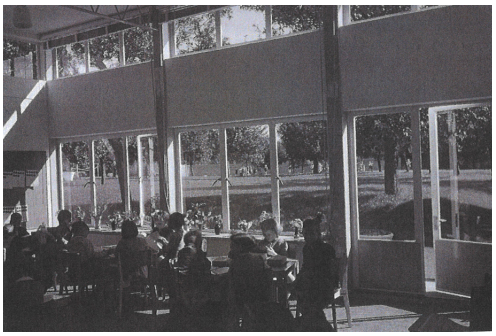
ceiling in the assembly hall, everywhere the exposed pipes and conduits, the black and dark brown thermoplastic floors, the unpainted, galvanised steel door frames, the unpainted, galvanised pressed steel switchgear, the calorifier pushed under the stairs, and the industrial, steel, lightshades. He predicted that without soft material and with children, which in his opinion the architects did not consider while designing, the noise in the building would be horrible (Boyne, 1954, p.336).

The prediction of Boyne became true as described by one teacher, who spent 37 years educating at the School of Hunstanton, as he complained about its horrendous sound transmission. Further he itemised its leaking roofs, cracking glass panels and the extreme temperatures in summer and winter (Parnell, 2012). The expansive glass walls caused the building to heat up like a greenhouse in summer and to freeze people inside in winter . Black panels have been added to the façade to counteract this (The Open University, 2001).

Another issue with the large openings in the facade was, that when you looked at the window the eye was strained due to the bright sky, which contrasted with Hunstanton's relatively dark interior (figure 19). Roy Kozlovsky argued, in his book 'The Architecture of Childhood', that the classroom window could have been planned upon the scientific certainty in respect of the properties of vision. This is something the Hertfordshire school 'Aboyne Lodge' did by having two window openings (figure 20). One lower for the view of the surrounding terrain, and one upper clerestory window to bounce skylight to the ceiling and to the classroom. This created a bright, non-contrasting interior classroom environment, something which the facade of Hunstanton failed to achieve (Kozlovsky, 2013, p.107-109).



19. Interior of a typical classroom at the School of Hunstanton (1954)



20. Interior of a typical classroom at Aboyne Lodge Infants' School, St. Albans, Hertfordshire (1949-1950)

The facade of Hunstanton was exposed as a bold statement of temporality and impermanence, although the school's rigid plan structure remains standing as a house to this day. Tijl Vanmeirgaeghe discusses the plan of the school in the architecture journal 'Oase'. He sees the plan as the material upshot of new educational needs and technical requirements of the post-war period, without losing the essence and permanence of being a school. He states that it *"rethinks the school in a fresh concept with classrooms upstairs and openness at ground level, yet also confirms its clarity, rhythm and regime."* (Vanmeirhaeghe, 2007, p.20).

This fresh concept of the plan was only possible by applying a steel construction. Someone who was impressed by the steel construction of Hunstanton was Philip Johnson. In 'an American follower of Mies van der Rohe' he analyses the influence of Mies van der Rohe on the work of the Smithsons. The pie-

ce was published in the Architectural Review in August 1954. He stated that perhaps the quality of steel engineering was the most surprising thing was for the Americans: *"The 'frames' of the building allow a 9-inch I-beam (a shape we do not have) to span 24 feet, and a glance at the thin truss members in the photograph is enough to make us (at least Americans) wonder."* (Johnson, 1954).

Hunstanton as an architectural statement

What recurs time and again in the discussion of Hunstanton is the conflict between being a good functional educational building and, what critics say is, the desire of the architects to make architecture. For instance, Christopher Grafe states that the Hunstanton School is above all an architectural statement. In his essay 'Finite orders and the art of everyday inhabitation' he frames Hunstanton despite, or perhaps because of, the exposed construction and material of Hunstanton, as a statement against the gangly picturesque planning of English modernist school building of the period. Grafe's words "a building that almost by accident houses an educational institution" indicate that the architectural appearance was more important than the function (Grafe, 1998, p.74).

Andrew Saint shares this concerns through the eyes of the Ministry's architects and writes in his book 'Towards a Social Architecture' that the Hunstanton School appeared as an arbitrary, individualistic essay of aesthetic of Mies van der Rohe, which was in stark contrast to so delicately tuned an educational instrument as Wokingham. The Smithsons claimed that, besides fulfilling its educational brief, the school design was handsomer, cooler, and stronger than any other secondary school built since the war. The Ministry's partisans were rather disturbed by the formality and austerity and the unapologetic image-mongering of the Smithsons' design (Saint, 1987, p.185).

However, the impact that the Smithsons had on school-building was not considered seriously by the A&B Branch, of which its priority was to raise technical and educational standards. For them Hunstanton was *"no more than a passing irritation"*, as Alison and Peter Smithson never designed another school for the English Welfare State. Nonetheless the Smithsons' design showed the potency of style, something which was suppressed for so long in school-building. The cool, empty photographs of the school, taken for publicity by Nigel Henderson, made it a rapid succès d'estime and rapidly made the Smithsons, from recently graduated students, to famous British architects (Saint, 1987, p. 186). As a work of architecture, Hunstanton was a rare glimmer of hope for architects who wished to reconstruct post-war England in the modern idiom. It therefore became canonical to this day, which is largely due to Reyner Banham's book 'The New Brutalism: Ethic or Aesthetic?' of 1966 (Parnell, 2012).

Yet before Banham published this book, he already wrote the essay 'The New Brutalism' about the same subject in 1955, just after the completion of Hunstanton. According to Banham, it was the ruthless logic, one thing of which the Smithsons have never been accused of lacking, which most hostile critics found distressing about Hunstanton. The reasoning underlying this obtrusive logic is that it contributed to the comprehensibility and coherence of the building as a visual entity, which made the building 'an image' (Banham, 1955).

What Banham meant with the concept of 'an image' was that a building should be an immediately perceptible visual entity; and that the form perceived by the eye must be supported by experience with the building during use. In addition, this form must be fully compatible with the functions and materials of the building as a whole . He states that a relationship between structure, function and form is, of course, the basic commonality of all good building, but the difference between good building and great architecture depends on if this form is also apprehensible and memorable. In Banham's view, British architects had forgotten this form-giving obligation to such an extent that a great deal of good building could be spoken of as if it were architecture. He considered this as a serious decay in English architectural standards: "It has become too easy to get away with the assumption that if structure and function are served then the result must be architecture." (Banham, 1955).

Banham blames the modern movement for its exclusively anonymous collaborative attention to structure and function, and forgetting to make architecture, which in the eye of Banham was making 'an image'. Something the Smithsons were good at was making 'an image'. They used the Miesian and Wittkowerian geometry as an device for the realization of 'Images', as they were one of the few recent examples of conceptual, form-giving design (Banham, 1955).

Conclusion

This thesis has examined and described the position of the Hunstanton School in the architectural debate. The school of Hunstanton has been examined through outlining the historical context, the philosophy of the architects, an analysis of its design and construction, and finally by highlighting the different opinions of critics.

The historical context in which the school of Hunstanton was designed was the post-war reconstruction of England. During this post-war period the Welfare State arose. This Welfare State focused on building a large amount of new schools, hospitals and houses. To do this standardisation was not a choice, but a need. Standardization was necessary to integrate the shortages of the post-war years with the demands of the period. The demands of the post-war period for schools had changed since the 19th century as the concept of good care had evolved from order and discipline to openness and homeliness. The introduction of 1944 Education Act placed the child at the centre of the educational system. School buildings were designed to meet the developmental and educational interests of the child. This combination of the great scarcity of materials to build the necessary schools and the new perspective on education and educational buildings meant that modernizing school buildings was needed.

This challenge was taken by the Hertfordshire County Council. They focussed on implementing progressive educational methods with a prefabricated building system. This system was made out of lightweight components, which could be assembled into various grid-based plans. The expertise developed at the Hertfordshire County Architects Department was spread in publications and was mostly discussed in architecture journals. The Hertfordshire schools dominated the post-war architectural debate and influenced the architecture of English schools. But besides being a model for modernizing architectural production, it was also a subject of controversy. Contrasting the Hertfordshire schools and the School of Hunstanton became an important issue in the architectural debate during the 50's.

Throughout several architecture journals and books the School of Hunstanton has been discussed. It has been criticized for functional problems and, in the opinion of multiple critics, ignoring the children for which it was built. The architects themselves, on the other hand, stated that the concept of the design was dictated by a close study of educational needs and purely formal requirements rather than by precedent. However, most criticism written about their work shows that Hunstanton had more potential as an architectural statement. Hunstanton's formality and austerity contributed to making the building an memorable 'image'. Banham stated that the difference between good building and great architecture depends on if the form is also apprehensible and memorable. The Smithsons' design showed the potency of style, something which was suppressed for so long in school-building. This was praised by some, but also dismissed by others. According to Saint, the Ministry's partisans were rather disturbed by the formality and austerity and the unapologetic image-mongering of the Smithsons' design. Saint considered Hunstanton as a stark contrast to delicately tuned an educational instruments as the Hertfordshire schools.

All in all the position of the School of Hunstanton in the architectural debate is mainly determined by its contrast with the Hertfordshire Schools. This was due to the fact both buildings stood for something that was part of a broader public debate over the role of architecture under the Welfare State: Hertfordshire for only taking flexible building system and well-being of children into account and Hunstanton for not subjecting architecture to political concerns. This contradiction in the architectural debate affected the way in which Hunstanton was viewed, namely either as a functional school building or as an architectural statement.

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