

CULTURAL ASPECTS OF MAKING SUSTAINABLE BUILDINGS

PROFESSOR BRENDA VALE
PROFESSOR ROBERT VALE
Victoria University, Wellington
School of Architecture,
PO Box 600,
Wellington,
New Zealand.
Phone: +64-4463-6200
e-mail: brenda.vale@vuw.ac.nz

ABSTRACT

One aspect of minimising the use of resources in the built environment is to make buildings that have a long and useful life. This has led to investigations into the useful life of materials, their environmental impacts, and designing for maintenance, all aspects which can be combined as part of the life-cycle approach to design of buildings. However, there is also a design dimension that needs to be considered. Buildings have to be produced that are not just economically viable but that are also culturally viable and acceptable over many years, in order to ensure building longevity. Using an example from the UK (the 1911 and 1934 exhibitions of model houses at Gidea Park) and one from NZ (the Wanganui Memorial Hall), the paper will demonstrate that buildings that satisfy cultural needs and expectations become the buildings that people love, and hence maintain, to ensure a long and useful life. This suggests that rational analysis of what makes a sustainable building must also be linked to ideas and issues about buildings that fit within a given cultural context.

KEYWORDS: longevity; cultural norm; tradition; sustainable design.

INTRODUCTION

There is a mantra that runs through the discussion of the sustainable house that much of what has been built in the name of sustainability so far is simplistic, rustic, boring and just not architecture. (eg. Stang, Hawthorne, 2005; Thomas, 2002). The upshot of this is the suggestion that only when architects start to design some fashionable sustainable buildings will the public realise that sustainability might be a desirable commodity. Against this has to be set the counter argument that one essential attribute of a sustainable building is that the resources put into it should be made to last as long as possible, thus echoing the “long life, loose fit, low energy” ideas that headed a report commissioned by Alex Gordon, then head of the RIBA, in the 1970s. (Blyth, Worthington, 2001) If longevity is the aim then the architecture will need to have a ‘timeless’ quality that will allow it to fit with changes in lifestyle and perception, continuing to have aesthetic validity over many years. In many minds, because of the work of Alexander and his team, this ‘timeless’ quality has become associated with tradition and the vernacular, not with fashion. (Alexander, 1979) Because the vernacular approach is seen as one that responds to climate and local resources, and the sustainable house also has to make use of the resources of the site and locality, this means that traditional design has tended to become associated with making sustainable buildings. However, as noted earlier, the traditional approach does not appear to satisfy many taking part in discussion of what makes good sustainable buildings.

This paper seeks an answer to the question of whether public opinion follows fashion or whether the public taste is more conservative, to ascertain whether the public are indeed waiting for fashionable sustainable buildings. At the same time the investigation will reveal what type of buildings do last a long time and suggest reasons for this longevity. The

investigation will look at two exhibitions held in Gidea Park in the UK that were designed to show the best of modern houses designed by architects in their day. Because the two exhibition sites are adjacent there is some similarity in the social context of the houses, making a relatively objective comparison of the houses, and what has happened to them since, a possibility. An examination of a single non residential building in New Zealand will also be used to look for why some buildings survive so well, making the resources that go into them last for many years.

GIDEA PARK

Gidea Park lies on the eastern railway out of London and early in the 20th century became, in part, a dormitory suburb as the new station at Squirrels Heath (now Gidea Park) made the daily commute into the city a possibility. Romford Garden Suburb, as it was first known, was planned by Bunney and Makins around the grounds of Gidea Hall and Romford Golf Course. (Anon, 1910) Today the estate is quiet, beautifully maintained, and a prime place to live, judging by the expensive cars parked outside the houses.

The area to the north of the new station was originally developed through the means of two exhibitions, the Modern House and Cottage Exhibition of 1911 and the Modern House competition of 1933. Viewing the houses that resulted from these two competitions and their condition today raises issues to do with the design and detailing of buildings and how this is related to houses that continue to look well over many years. This can be further broken down into a discussion of the materials and details of the houses and how these relate to their survival, and how the design and materials not only make maintenance easy but create the desire to maintain the house because it fits an image of what a 'proper' house should be. It should be no surprise that the older houses in Gidea Park have stood the test of time far better than those built 22 years later.

THE 1911 EXHIBITION

Many of the architects submitting entries for the 1911 competition had been articled in offices of architects associated with the Arts and Crafts movement, or attended evening classes at schools of architecture like the AA, where they would have encountered figures like Voysey and Ernest Newton in the studio. Even before conscription into the army in 1914 had demonstrated that one cause of poor health was poor housing, and raised the cry for 'Homes for Heroes' (Reiss, 1918), the search for the cost effective cottage to house the labourer was seen as a serious architectural endeavour. (Weaver, 1913; Allen, 1913) Along with this was recognition that a rising middle class also demanded houses and that architects could apply similar principles to the design of suitable dwellings for them. The architectural journals of the early years of the 20th century carry many articles and competitions underlining that this quest was seen as serious. There was also a move to make sure that the public were aware of what architects could achieve, with the 1905 Cheap Cottage Exhibition at Letchworth, the site of the first Garden City, architectural contributions to the early Ideal Home Exhibitions, which started in 1908, and the later exhibition at Gidea Park, the subject of this paper. The vast majority of the houses and cottages exhibited demonstrated an Arts and Crafts pedigree.

There was some criticism of the 1911 exhibition, which was free to the public, as it was seen as an easy way for Gidea Park to obtain a new suburb:

The company have, no doubt, done extremely well, and must be laughing up their sleeve at the 140 odd architects who bought their [the company's] land and built up their estate for the paltry consideration of £1,050 in prize money, and the promise to buy a few of the houses. (Webb, 1911)

The exhibition began with a competition for detached dwellings in two classes: the small house had to cost £500 (Class I) and the cottage £375 (Class II). It was felt that these sizes

represented the majority of houses that were then required in the suburban expansion of outer London. (Anon, 1911a: Preface) These conditions saw 120 architects design houses, most of which were entered for the competitions, which might lead to further commissions from the public, even if they did not win a prize. The houses were for sale, though Adshead points out that it was the builders who provided the finance and actually took the risks. (Adshead, 1911) Prizes were awarded not just for the houses, but also for a garden suburb design, internal fittings, the garden layout, improvements in materials, improvements in services fittings, and the furnished house. The various judges included famous names such as Halsey Ricardo, Guy Dawber and Laurence Weaver. (Anon, 1911b)



Winning design by Curtis Green, as originally built although the landscaping has matured; the design was criticised because the row of windows in the gable lit both the stairwell and a bathroom, and it was felt a bathroom window should not front on to the street façade. (see plan below) However, the Arts and Crafts pedigree is obvious.

Many known names appeared in the exhibition: Baillie-Scott had houses in both classes, Parker and Unwin had houses not for competition, Curtis Green (winner above) also gained a highly commended for his Class II house, and Clough Williams-Ellis won a prize in the improvements in materials class and his design was later included by Weaver in *The Country Life Book of Cottages*. (Weaver, 1913)



House by Baillie-Scott with upper floor rooms partly within the roof-space and chimney stack clearly expressed. The asymmetrical composition of the house is typically Arts and Crafts. This house with its small windows draws on the English vernacular, but updated to standards expected at the start of the 20th century.

The competition was so successful at attracting entrants that Edwin Gunn, who designed a house in Reed Pond Walk, recalled it towards the end of his life as follows

All the young, and a few of the not-so-young architectural enthusiasts were attracted to this exposition—in fact, the cheap mid-week train to Gidea Park during the building period seemed like a travelling AA with a few stray architectural non-members. The Exhibition catalogue, which appeared in due course, contained the names (and designs) of almost every “live” contemporary architect between the ages of 20 and 30...(Arbalest, 1942)



House by Bunney and Makins who also planned the estate at Gidea Park, with steeply pitched roof. Again the upper floor rooms are partly within the roof space. Windows are small and the chimney stack is an important vertical element. Although the form is symmetrical, apart from the porch placement, the window distribution is not, responding to the rooms inside.



Winning Class I design by Geoffrey Lucas in £500 class, with the fourth bedroom in the roof space; the original ground floor window design remains on left (kitchen) while that of the sitting room has been replaced with a bay. All other window proportions are as original though cottage casement windows have been replaced with an introduced top hung sash.

The winning design, by Lucas, points away from the asymmetrical compositions of the Arts and Crafts cottage and towards the neo-Georgian that was later to find expression through the hands of architects like Louis de Soissons at Welwyn Garden City. Adshead preferred the pair of Heath Drive houses designed by Jones, that were not part of the competition, where the shallow hipped roof was hidden behind a parapet in the Georgian manner. These houses had been designed according to Reilly's theories of what a suburban house should be like, as put forward in his address to the 1910 Town Planning Conference. (Reilly, 1910; Adshead, 1911; Anon, 1911a)



One of the group of four houses by Ronald P Jones that Adshead preferred, appearing unchanged. Although the detailing is not Arts and Crafts the traditional materials and attention to detailing have made a house that has been successfully maintained over the years.

THE 1934 EXHIBITON

In June 1933 there was an announcement of a competition for members of the RIBA to submit designs for five classes of houses. Classes A and B were for semi-detached houses of

£800 and £1000 the pair and the other classes for detached houses costing £650, £800 and £900. The judges, who included Adshead, Maxwell-Fry and Howard Robertson, were to select five or more designs in each class and the successful architects were then to obtain a builder's tender for erecting the house. If this were approved the architects would then be appointed by the promoters, (the Directors of Gidea Park Ltd.) to supervise construction of the house on the exhibition site, which was a piece of land to the north of the original competition site adjoining Eastern Avenue, the dual carriage way from London to Southend. (Anon, 1933)

Once the houses were erected, there was to be a further competition to select prize-winning designs. In the middle of 1934 *The Builder* published drawings of a series of designs then nearly completed for the exhibition, The majority of the designs had a flat roof, although hipped roofs were also prevalent and one published design, by architects Smith and Wood looked as if it had been left over from the 1911 exhibition with its steeply pitched roof covered in handmade tiles with two massive brick stacks and an outshot at the front to cover half of the integral garage, this seeming its one concession to be considered modern. (Anon, 1934a) This house has survived with the view to street apparently unaltered.



House in 1933 Exhibition in the Arts and Crafts manner by Smith and Wood, which is unchanged apart from the hard paving of the front garden to provide car standing.

Thirty-five houses, out of 475 submitted schemes were built and opened to the public for the first three weeks of August. They were then sold, adding on to the competition cost the architect's fee, site value and external works. The assessors' report, as summarised in *The Builder*, felt the schemes for the 'modern' house fell into four groups. The first were houses of traditional character with pitched roof and small windows of either the cottage or Georgian type, as shown above. The second were those which used elements of the modern but not its essence, and these were largely eliminated in the judging. An example that has survived is the four bedroom detached house by John Leigh, of rendered brick with a glazed pantile roof, and the 'jazz moderne' decoration around the front entrance and stairwell.



Four bed house by John Leigh in 'jazz moderne' style which was been altered since it was first built, most dramatically by the removal of the symmetrical chimney stacks rising from the eaves either side of the front elevation.

The projection on the left of Leigh's house, which originally contained fuel storage and an outside WC, has been re-windowed and the projecting integral single garage has been extended. The two symmetrical chimney stacks originally rising from the eaves of the side elevations have been removed.

The third group, which was a substantial portion of the whole, were designs that used traditional materials, such as brick, timber roofs, usually flat, that used larger areas of glazing intelligently by facing this towards the sunny south, and also freer planning. The winning design by Thornton White (who a few years later became the first professor and head of the School of Architecture in Cape Town) would fall into this category. This house was commended because the raised parapet sheltered a terrace on the flat roof which could be accessed by an internal stair, thus including in this the design the 'toit jardin', one of Le Corbusier's five points of architecture. (Le Corbusier, 1967) This explains the height of the wall to the street. The upper floor window openings have not been changed although the house has been re-windowed. An extension has been added across the ground floor of the front façade lining up with the end of the projecting single garage of the winning design, although the entrance door is still centrally under the main window, as in the original. The single garage of the original design has also been extended. The white paint is another change, from the exposed bricks of the original.



Winning design of LW Thornton White, which has had a substantial extension built on to the front.

Two houses were considered modern because of their use of materials, both using reinforced concrete, allowing, "...the designers to plan on a basis of the exact functioning of the domestic machine." (Anon, 1934b)



Concrete house by H Spence Sales with an extension built across part of the original north facing front elevation.

One of these was an £800 detached house by H. Spence Sales, built for a final cost of £822. The external walls were four inch (100mm) reinforced concrete with an insulated cork board lining. The roof was also concrete, interior partitions were breeze block, and the floor covered with masonite rubber. The interior was described as distempered but finished with murals and

furnishings by a contemporary decoration group. (Myles Wright, 1946) The plan responded well to the sun as the main rooms faced the garden on the south side. The combined living-dining room was almost fully glazed and protected by an overhang, with three of the four bedrooms also facing south. The master bedroom had access to a balcony above the forward projection of the living room, thus making use of the flat roof. The house still had two chimneys, one for the fireplace in the living room and one for the Ideal boiler in the kitchen, although the stacks were underplayed. The front elevation now has an extension across the front where once there was a cantilevered concrete porch. The window positions in the upper floor are original. The brackets above the garage roof are a new addition.

The second concrete house was that by Skinner and Tecton, recently restored because of its connection with Lubetkin. This house, the prize winner in the £900 class, was stated to be, "...of concrete frame construction, the walls being 4in, with a 2in. cork lining used as shuttering for the concrete. This is claimed to have an insulation value equivalent to 30ins. of brickwork." (Randal Phillips, 1934) The final cost of this house was given as £1475. This house has recently been restored at no little cost, although some alterations, such as the enclosure of an external terrace to make a fourth bedroom upstairs (above the front door) have been retained.



The restored front façade of house by Skinner and Tecton

Apart from the detached houses, examples of which have been discussed above, and unlike the 1911 competition that of 1933 included designs for semi-detached houses, all of which were built fronting on to the Eastern Avenue, a road which is now very busy. These houses have generally fared less well, although they include designs attributed to well known architects, such as FRS Yorke who was author of *The Modern House* and *The Modern House in England*. Yorke had acted as the supervising architect for the scheme by Holford and Stephenson who had met as students at the Liverpool School of Architecture and were teaching there. (Cherry and Leith, 1986)



Holford. Stephenson and Yorke, semi-detached house with cement rendered walls. The house on the left has had a different window inserted in the ground floor front but is otherwise as original, whereas the house on the right has undergone considerable change.

The houses they designed were built of brick with compressed fibre board insulation and a steel column supporting the projecting third bedroom. The image above shows the north face where a new window has replaced the original small window to the WC besides the front door. Behind the WC was a fuel store accessed from under the projecting bedroom. The two main bedrooms and living room on the garden side all had large sliding steel windows facing south. (Yorke, 1944)

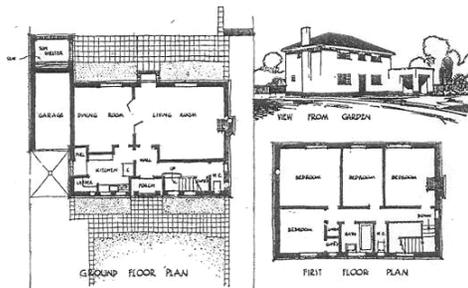
Generally the current state of the semi-detached housing in the 1933 competition, with its less than prime position fronting directly on to a very busy dual carriageway, is not good. The detached modernist houses, which are nearer to the 1911 houses, have fared better, although as shown below a number have been altered to more resemble their 1911 neighbours. Several of the semi-detached houses with flat roofs and rendered walls have been substantially rebuilt. The exceptions are those with brick walls, as the better quality facing bricks seem to have lasted, and those with pitched roofs, which like their 1934 detached counterparts, have survived with less alteration. Typical of the latter are houses by Geoffrey Ransom, an architect from Holt in Norfolk, who also had an exhibited house in the four bedroom category. Since the houses all had the same budget, this would suggest traditional forms, materials and details have been both easier to maintain and more likely to be maintained by their owners.



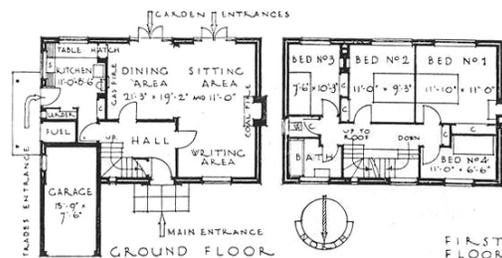
Ransom's detached four bedroom house in ivory brick and green pantile roof. The shutters and pitched roof detail over the porch are the only additions. Placed next to the Skinner and Tecton entry, the judges' definition of modern seems very accommodating.

COMPARISON OF INTERNAL PLANNING

Apart from the use of materials, and as shown only the two houses with reinforced concrete walls in the 1934 exhibition had made any attempt to use 'new' materials and techniques, the free plan was another tenet of modernism. As might be expected, the conventional 4-bed house by Ransom (above) did not have a free plan but was a neat arrangement that gave three of the four bedrooms and the living and dining rooms, which could be opened up into a single space, views over the rear garden.



Left: 1934 Exhibition 4-bed house by Ransom (Anon, 1934b)



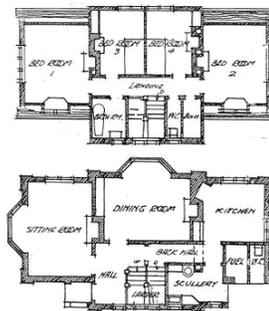
Right: 1934 Exhibition winning 4-bed house by Thornton White (Myles Wright, 1946)

The winning Thornton White house shows a broadly similar approach but with less flexibility in the single open plan living space. However, very similar plans appear in some of the four bedroom houses of the 1911 exhibition, with the exception of the living rooms, which in 1911 are clearly in two separate rooms. (see below)

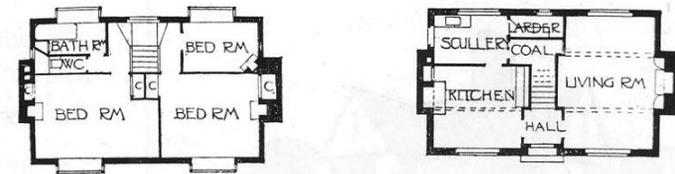
Some of the three bedroom layouts in both exhibitions tend to be variations of the 3-bed 'universal plan' of much suburban housing in the UK, but even when this is avoided similarities occur. Thus the cottage by Curtis Green, which is described as, "Planned in the simplest manner", has a very similar disposition of rooms to the three bedroom entry of Thornton White. However, the appearance of the two houses is vastly different, as the Thornton White house has the necessary flat roof, plain exterior brick walls, and under played chimney stacks, whereas that of Curtis Green has a pitched tiled roof with dormer windows and the stacks are emphasised to form strong vertical elements in the composition.



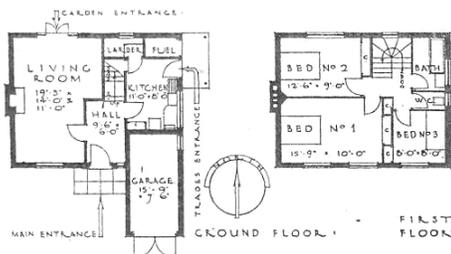
4-bed house by Crickmer in 1911 Exhibition, which like that of Thornton White above gives all main rooms and the three main bedrooms a garden view. (Anon, 1911a)



4-bed house by Longden in 1911 exhibition which has a similar layout to that of Crickmer but with all living and bedrooms given a sunny, garden aspect. Unlike the 1934 plans, however, both Crickmer and Longdon houses have separate living and dining rooms. (Anon, 1911a)



3-bed plan by Curtis Green in the 1911 Exhibition which should be compared to the plan of Thornton White below. (Anon, 1911a)



The 3-bed house plan by Thornton White for the 1934 Exhibition shows a similar disposition of rooms and staircase to that of Curtis Green above, but with an integral garage. (Anon, 1934b)

There are two other small points of difference between the house plans of the two exhibitions. The 1934 houses have more built in storage and a garage is provided, often at least partly within the main house envelope, reflecting changes in society in the intervening years.

CHANGES TO THE HOUSES

The area covering both exhibitions is now a conservation area. As the photos above show, the 1911 houses have been maintained and are obviously still providing satisfactory housing at present, even if some efforts have had to be made to accommodate the car or cars. Although Adshead had described the juxtaposition of so many different cottage style dwellings as “abnormally picturesque”, (Adshead, 1911), the growth of trees and hedges in the intervening years has softened and filled in the street façade to make a very desirable place to live.

Of more interest are the changes that have been made to the flat roofed houses to try and make them more acceptable. Many have been painted, even when the original walls were of brick, suggesting a need to keep the whole water tight. Often, however, changes are more substantial, as shown in the examples below.



The house by Mioprio and Spencley has been given the ‘Georgian’ treatment (see also winning house by Thorton White above, with its front entrance columns.) The curved bay was an original feature but with horizontal format steel windows, now replaced.



A pair of house by Concannon and Schultz, one of which has been given the ‘cottage’ treatment, with its shutters and small pane window sashes.

The fact that the older houses have survived unaltered suggests that not only were their materials and construction methods durable but, perhaps more importantly, the image of the house presented was an acceptable one to the users, who have seen little need to change the design of the original.. This has a very important message for those attempting to make a sustainable built environment. One of the keys to sustainability is to make resources fulfil a useful life for as long as possible. Minimising the resources that are needed for maintenance over the life of the building is also important. However, in all life-cycle discussion what is forgotten is that the house has to represent something the user wants, not something that is offered to them in the name of good design. Where the user is not given what they want they will use more resources to remodel the design. What the two exhibitions at Gidea Park show is that traditional materials and traditional approaches to design last. In essence, they are sustainable.

WANGANUI WAR MEMORIAL HALL

However, there are examples of modern architecture which have lasted and have been well maintained, such as the Wanganui War Memorial Hall, a competition winning design by Gordon Smith of the partnership Greenhough, Smith and Newman. The three had finished their architectural training in Auckland in 1954 and were in London when they finalised the competition entry.

Wanganui War Memorial Hall is determinedly modernist in its use of materials (reinforced concrete and specially made white concrete block), in the lifting of the building on pilotis above street level, another of Le Corbusier's tenets of modernism (Le Corbusier, 1967), and in its simplicity of form. As the competition judges commented:

The main features of this design which make it outstanding are its overall architectural conception and its spaciousness and simplicity, which give it dignity and a monumental quality. (Anon, 1956a)



The hall was given a new roof in 2001 but the interior has remained virtually unchanged since the building opened on ANZAC Day 1960, having started on site in 1956. The building thus appears to have been carefully maintained over its life. In part this may be less to do with the design than the investment of the community in its creation. After WWII a number of separate community groups were looking for facilities. The Scots Memorial Hall Trustees had collected money for a memorial hall to commemorate Scottish pioneers, the RSA were looking for a place to hold the book of remembrance and the perpetual flame and the Highland Pipe Band wanted a practice room. The SMH Trustees offered to put their funds towards a joint venture noting that the government would also put money towards the creation of a living memorial in the form of a building that would serve the local community. The council then backed the venture and some years were spent collecting funds. During this time a concert chamber became part of the brief and eventually a competition was opened in 1954. It is a tribute to the local people that of the architect's estimated cost for the completed building of £160,000 the government had only supplied £50,000. (Anon, 1960)

The competition attracted a record entry of 42 schemes, and the three premiated designs were all in the modernist style. (Anon, 1956b) The fact that the building was to be a memorial to those lost in the war had not been forgotten by the designers.

Beneath the poised block and visible from the street, will be seen the constantly lit Book of Remembrance, presenting the theme of the block floating over, protecting as it were, the book. (Anon, 1960)

The building was also to be flexible, with the lighting designed to offer sufficient light for exhibitions and softer light for dances and other functions. The concert chamber, although acoustically optimised for chamber music, could be used in other ways.

Like the 1911 Exhibition at Gidea Park, what strikes the visitor about the Wanganui War memorial hall today is its well cared for and 'loved' appearance. This is a building that is respected by its community and means a lot to many people because of what it is and how it was procured. It is the fulfilment of this cultural dimension that has ensured the building's sustainability, and hopefully will continue to do so in the light of the current design proposals for this building and area of the city.

CONCLUSION

Although the creation of a sustainable built environment is normally viewed as a design problem, most of the built environment of the world already exists. This is important, as the longer a building lasts and continues to give service, the less will be its environmental impact. However, for buildings to last they have to be an acceptable part of the built environment over many years, and they also have to be maintained. The example of Gidea Park shows that housing that fits a cultural norm and that is built of materials and with details that are designed to last will be maintained, will function over many years, and hence will be sustainable. This suggests that the public are not waiting for the latest fashionable sustainable architectural creations before they rush to live in sustainable houses. In fact, the more 'normal' the sustainable house appears, the more acceptable it may be. Le Corbusier had a similar experience with his modernist houses at Pessac where the occupants were quick to customise and normalise them. (Boudon, 1972)

However, The Wanganui War Memorial Hall demonstrates that design may be much less important than how a building is procured and what it is for. The fact that the community had a huge emotional and financial investment in the building gave meaning to that building for the community, far more than any superficial intellectual meaning the architects may have attached to it. This also suggests that a sustainable built environment is one where the users have a significant involvement in the procurement of buildings, a long way from the developer and financier led procurement process of current society.

REFERENCES

- Adshead, S.D. 1911. "Romford Garden Suburb, Gidea Park: Cottage Exhibition and Town Plan". *Town Planning Review* 2 (2) July 1911. 63; 125.
- Alexander, C. 1979. *The Timeless Way of Building*. Oxford University Press, New York.
- Allen, J.G. 1913. *The Cheap Cottage and Small House*. Garden City Press Ltd., Letchworth.
- Anon. 1910. *Garden Suburbs, Town Planning and Modern Architecture*. T. Fisher Unwin, London. 47-8.
- Anon. 1911a. *The Hundred Best Houses: the book of the House and Cottage Exhibition 1911*. The Exhibition Committee, London. Preface; 71.
- Anon. 1911b. "Gidea Park: List of Awards". *The Builder*. 17th Nov 1911. 56.
- Anon. 1933. "Competition News". *The Builder*. v144. June 23rd 1933. 992.
- Anon. 1934a. "'Modern Homes' Exhibition, Gidea Park". *The Builder*. v147. July 6th 1934. 19.
- Anon. 1934b. "Modern Homes Exhibition, Gidea Park". *The Builder*. 12th Jan 1934, 20 and 1; 50.
- Anon. 1956a. "Wanganui War Memorial Hall Competition report of the Jury of Award". *The Journal of the NZIA*. v23. March 1956. 34.
- Anon. 1956b. "Wanganui War Memorial Hall Competition". *The Journal of the NZIA*. v23. April 1956. 61-7.

Anon. 1960. "Wanganui War Memorial Hall: a Remarkable Building". *The Journal of the NZIA*. v27. August 1960. 176; 174.

Arbalest. 1942. "The AA in Early Days III". *The Architect and Building News*. 1st May 1942. 74-5.

Blyth, A. and Worthington, J. 2001. *Managing the Brief for Better Design*. Spon, London and New York. 41

Boudon, P. 1972. *Lived-in Architecture: Le Corbusier's Pessac Revisited*. Lund Humphries. London.

Cherry, G.E. and Leith, P. 1986. *Holford: a study in architecture, planning and civic design*. Mansell Publishing, London. 55-6.

Le Corbusier. 1967. *Le Corbusier 1910-65*. Thames and Hudson, London. 44.

Myles Wright, H. (ed). 1946. *Small Houses £500-£2500*. The Architectural Press, London. 86.

Randal Phillips, R. 1934. "An exhibition of modern houses at Gidea Park". *Country Life*. 4th Aug 1934. 124.

Reilly, C.H. 1910. "The city of the future". *Town Planning Review*. vol.1. 193-4.

Reiss, R. 1918? *The Home I Want*. Hodder and Stoughton, London.

Stang, A. and Hawthorne, C. 2005. *The Green House: new directions in sustainable architecture*. Princeton Architectural Press, New York. 9.

Thomas, D. 2002. *Architecture and Urban Environment: a vision for a new age*. The Architectural Press, Oxford. 51.

Weaver, L. 1913. *The "Country Life" Book of Cottages*. Country Life Ltd., London. 87-90.

Webb, M.E. 1911. *The Builder*. 21st July 1911.

Yorke, F.R.S. 1934. *The Modern House*. The Architectural Press, London.

Yorke, F.R.S. 1944 (2nd ed.). *The Modern House in England*. The Architectural Press, London. 35.