ULTRA

Positions and Polarities Beyond Crisis

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Fresh Air and Sunshine: The Health Aspects of Sleepouts, Sunrooms, and Sundecks in South Australian Architecture of the 1930s

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Abstract

This paper explores some of the public health ideas which were expressed in South Australian architecture in the early twentieth century with a focus on their physical manifestation in residential building types. In particular, the incorporation of sleepouts and sunrooms and the elaboration of these spaces from enclosed verandah to purpose-designed room for exposure to fresh air and sunshine will be discussed. The exterior space of the sundeck or rooftop terrace will also be examined in relation to healthy open-air living. Utilising a historical interpretive method three case studies drawn from South Australia in the 1930s will be examined in detail. These buildings are the Yelland Residence, Hyde Park by Keith Yelland (1936); an apartment building complex, 'Retten', at Glenelg, (1938), by Harold T. Griggs; and the Hardy residence, at Netherby, (1938), by Russell S. Ellis. Primary archival material, including architectural drawings, specifications, and correspondence, has been drawn upon and contextualised using published contemporary sources on both health and architecture.

Introduction

At the turn of the twentieth century, public health was one of the main concerns of not only the medical profession, but also architects, planners, and sanitary reformers. Together the professions looked forward to a time when diseases, especially infectious diseases and epidemics, could be controlled and quality of life would be improved through public health measures and improved environmental conditions. Australia, which suffered from similar disease outbreaks and causes of mortality to many counties across the globe, looked to Britain, Europe, and America for their lead in the field of public health, with local architects anxious to play their part in designing places for improving the health of all citizens. This was a time when architects and town planners were active in public health, publishing plans in medical and sanitary journals and delivering lectures to gatherings of health experts as well as the interested public.

Many building designs of the twentieth century had their planning, aesthetics, services, and materials influenced by architects' understandings of the medical concerns, theories, and treatments common at the time of their design. Access to fresh air and ventilation was championed as essential to healthy living and was one of the aspects of design linking public health and architecture. Additionally, exposure to sunlight both outside and inside buildings was recognised as beneficial in the promotion of general health and wellbeing. Of the prevalent diseases, tuberculosis remained a major concern until the latter half of the twentieth century, and as such its impact on health and place debates was significant. This paper aims to contextualise the public health and architecture relationship in the early twentieth century in South Australia, especially focussing on tuberculosis as an airborne infectious disease. Three case studies from South Australia in the 1930s will be explored using a historical interpretive method and focussing on some of the features designed to enable access to fresh air and sunlight, specifically purpose-designed sleepouts, sunrooms, and sundecks in residential buildings with the health rationale behind their planning, materials, services, and expression evaluated.

Methodologically, Wilbert Gesler's concept of 'therapeutic landscapes', has been used as a guiding framework to ground this paper by analysing 'natural, built, social and symbolic environments as they contribute to healing and wellbeing in places.'[1] This paper also explores the role public health knowledge played in the design of these buildings. A further aspect of analysis examines 'architecture [as] a form of medical technology', a proposition which has been extended to the analysis of the case studies selected.[2] This theoretical framework, which builds on the notion that buildings and environments can be interpreted as places of 'therapeutic action' and *'les machines à guérir'* – 'curing machine[s],'[3] demonstrates how they could be perceived as 'not simply the place of the cure, but also an instrument of the cure itself.'[4]

Among the limitations of this paper is its reflection of understandings of health and disease as they were during the twentieth century. Some of these perspectives are now understood as well-intentioned but misguided, constructed on imperfect, biased, or flawed knowledge. By reflecting on the understandings of the time the intention is to explain

1. A. Williams, *Therapeutic Landscapes* (Aldershot: Ashgate, 2007), 1-2.

2. A. Adams, K. Schwartzman, and D. Theodore, "Collapse and Expand: Architecture and Tuberculosis Therapy in Montreal, 1909, 1933, 1954," *Technology and Culture* 49, no.4 (2008): 911.

3. M. Foucault, "The Politics of Health in the Eighteenth Century" in *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*, ed. C. Gordon, (New York: Harvester Wheatsheaf, 1980), 180.

4. S. Elden, "Plague, Panopticon, Police," *Surveillance and Society*, 1, no.3, (2003): 245.

how these medical ideas were in part responsible for the designs of the historic buildings that we are familiar with today, rather than evaluate the efficacy of their health effects.

Public Health and Architecture in the First Half of the Twentieth Century

One the most well-known names to architectural historians, Banister F. Fletcher, architect and co-author of the reference work, *A History of Architecture on the Comparative Method*, in an address to the Congress of the Royal Institute of Public Health in Scotland in 1900, stated that 'architecture is public health in its broadest and possibly its best sense'.[5] He imagined a future where disease would be lessened and the health of the population would be improved, in part through architecture and planning, a subject he also tackled in books *Architectural Hygiene and The English Home* which took a health-based or sanitary approach to planning, materials and construction and which he co-authored with his brother.[6] Fletcher was not alone in his thinking, his address reflected the concerns of many architects, health professionals and reformers, and reiterated several ideas which had gone before including those from Florence Nightingale, William Eassie and Benjamin Ward Richardson.[7]

One disease, tuberculosis, remained the major public health concern until the latter half of the twentieth century, and as such, its impact on architecture and planning was significant. Pulmonary tuberculosis, consumption, or the white plague, is an infectious bacterial disease with symptoms of coughing - sometimes with sputum or blood - chest pains, weakness, weight loss, fever and night sweats, and is spread through airborne droplets from the throat and lungs of infected persons.[8] Until the mid-twentieth century there was no cure, no vaccine, and limited medical or pharmacological treatments, and the 'open-air treatment' was the most widely accepted way of managing patients. This treatment involved living as much as possible in the fresh air with the belief that it would aid blood circulation to the lungs and improve the overall health of sufferers.[9] The open-air treatment also encouraged good nutrition, isolation of the ill, good hygiene, exercise, and education, where possible at sanatoria for limited inpatient stays. The architectural expression used for tuberculosis sanatoria ranged from the Gothic inspired to the English vernacular to the modern, with adaptation of local architectural styles occurring across the world. Large sanatoria with narrow linear wings were popular across Europe, while in America, cottage style sanatoria in village like settings became the favoured solution.[10]

South Australia followed the international open-air movement with the first sanatorium purpose-designed for the open-air treatment opened in 1895 at Kalyra, Belair, in the hills above Adelaide followed by Nunyara Private Sanatorium in 1902.[11] These sanatoria followed the pavilion plan in which long rectangular buildings allowed for cross ventilation through large windows on either side of the ward.[12] However multiple bed wards were not ideal when dealing with infection control and Nunyara substituted private bedrooms.[13] The verandah, already a component of Australian building, was used at both sanatoria as it allowed exposure to as much fresh air as possible both day and night, with bedrooms opening out to the verandahs through large windows and doors.[14]

5. B. Fletcher and B.F. Fletcher, *A History of Architecture on the Comparative Method*, (London: Batsford, 1905); B.F. Fletcher, "The architecture of the twentieth century from the point of view of public health," *Journal of State Medicine*, (January 1901): 10.

6. B.F. Fletcher and H.P. Fletcher, *Architectural Hygiene; or, Sanitary Science as applied to Buildings*, (London: Whittaker and Co., 1907); B.F. Fletcher and H.P. Fletcher, *The English Home*, (London: Methuen, 1910).

7. W. Eassie, *Healthy Houses: A Handbook to the History, Defects, and Remedies of Drainage, Ventilation, Warming, and Kindred Subjects*, (London: Simpkins, Marshall and Co., 1872); F. Nightingale, Notes on Nursing, (London: Harrison, 1860); B.W. Richardson, *Hygeia: A City of Health*, (London: Macmillan and Co., 1876).

8. World Health Organization. "Tuberculosis Key Facts", 2021, https://www.who.int/news-room/fact-sheets/detail/tuberculosis accessed online 2 February 2021.

9. P. Warren, "The Evolution of the Sanatorium: The First Half-century, 1854–1904," *Canadian Bulletin of Medical History*, 23, 2 (2006): 462.

10. J. Collins, *The Architecture and Landscape of Health: A Historical Perspective on Therapeutic Places 1790-1940*, (Abingdon and New York: Routledge, 2020).

11. J. Collins, "Life in the Open Air: Place as a Therapeutic and Preventative Instrument in Australia's Early Open-Air Tuberculosis Sanatoria," *Fabrications* 22, no.2, (2012): 214.

12. G.C. Cook, "Henry Currey FRIBA (1820–1900): leading Victorian hospital architect, and early exponent of the 'pavilion principle'," *Postgraduate Medical Journal*, 78, (2002): 352-359.

13. Collins, "Life in the Open Air".

14. A. Bashford, *Imperial Hygiene: A critical history of colonialism, nationalism and public health*, (London: Palgrave Macmillan, 2003), 71.

Health reformers and town planners reflected the popularity of open-air living in their work and called for light, air and space in housing, school, and suburb design, both to counter the severity of tuberculosis but also to aid in its prevention.[15]

15. J. Collins and P. Lekkas, "Consumption crusade: the influence of tuberculosis on the emergence of town planning in South Australia, 1890-1918." *Planning Perspectives*, (2021), DOI :10.1080/02665433.2021.1902848.

Sleepouts for Health in South Australia

With the acceptance of the open-air treatment for tuberculosis and the popularity of sanatoria, outdoor sleeping became medically advised behaviour, not only for treating tuberculosis but for general good health. South Australian Medical Officer of Health, Dr Thomas Borthwick praised the South Australian climate for allowing both natural ventilation of homes and windows being able to be left open overnight in both summer and winter.[16] Newspapers also advocated that anyone with tuberculosis should sleep outside, encouraging sufferers to 'live practically in the open air all the year round,'[17] imploring people 'Do not be afraid of fresh air. Remember, that night air is not harmful. Allow a free circulation of air through the house at night - especially through sleeping rooms.'[18] The *Australian Woman's Mirror* magazine recommended that, '[t]he best place for [the tubercular patient] is a small fly-proof chalet fitted with good blinds. Next best is a sleeping porch, again with blinds, but failing either, an airy room with windows facing south and east.'[19] By 1913, the Chairman of the Central Board of Health and Head of the Health Department of South Australia, physician Dr William Ramsay Smith reported on South Australia's experience with tuberculosis at a conference held in Washington in the United States of America stating that, '"Sleeping out" at home in the free fresh air and alone is becoming fashionable among all classes'.[20] The fresh air of the night was perceived as health giving across the world,[21] and by the 1935 it was stated that 'the Adelaidean is a lover of the open air.'[22]

16. "Dr Borthwick Interviewed," *Advertiser*, (2 August 1901): 6.

17. "Consumption," *South Australian Register*, (10 September 1898): 9.

18. "Tuberculosis" *Coolgardie Miner* (11 April 1914): 1.

19. "Nursing a Tuberculosis Patient at Home", *The Australian Woman's Mirror,* (6 June 1933): 28.

20. W. Ramsay Smith, "Twelve Years' Experience of Compulsory Notification of Pulmonary Tuberculosis in South Australia," (Adelaide: Government Printer, 1913), 5.

21. P. Baldwin, "How Night Air Became Good Air, 1776-1930," *Environmental History* 8, no.3, (2003): 412-429.

22. A.C. Strempel, "The Small House in South Australia," *Australian Home Beautiful* (1 August 1935): 28-32.

Despite the upbeat reporting of the fashion for open-air living, the grim reality of the lives and habitations of many tuberculosis sufferers was stark by contrast. Documentation of tubercular patients sleeping in the open-air can be found in the 'Report on the Control of Consumption in South Australia' compiled by Ramsay Smith in 1911. Enclosed verandahs were mentioned in several of the cases. In that of a 22-year-old female, it was recorded that: 'The patient sleeps in the front verandah at present, which is enclosed with canvas. Mr. P. [her father], by Dr. B.'s advice, is building an iron room in the yard for the patient'. Several cases in the report show how in desperate situations those who were renting accommodation had no recourse to such adaptations and many suffered and died in substandard dwellings. In the case of a 27-year-old male, the report reads: 'He had a cough and expectoration. … he slept in a tent on the lawn at the rear of the house.' In another case, a female of 21-years, '[w]as at Nunyara Sanatorium for one month. … [and now] [t]he patient is sleeping in the same bed as her sister, 18 years of age, and does not understand she is suffering from consumption. I advised her to sleep in a separate room … or if possible to sleep out of doors.'[23] Not only did the enclosure of verandahs enable sleeping in the fresh air, but with the annexation of extra rooms, it addressed overcrowding, a contributor to transmission of airborne disease within the home.

23. W. Ramsay Smith, "Report on the Control of Consumption in South Australia", (Adelaide: Government Printer, 1911), 16.

Sleeping in open-air also helped to combat the problem of heat and

stuffiness within homes in the South Australian summer. As the *Mail* wrote in 1937, 'In the Spring, householders' thoughts turn to the building of sleep-outs' citing the need 'to ensure cool nights' during summer.[24] The early twentieth century 'sleeping-out craze', as *Building* magazine termed it, led to sleepouts being seen as almost essential.[25] Sleeping out became a regular topic of discussion in local newspapers during the 1930s, especially in terms of advice for do-it-yourself handymen.[26] The enclosure of existing verandahs by the homeowner was recommended to readers as a something they could achieve with timber framing lined with asbestos sheeting and 'gauze' flywire.[27] In South Australia, the 'fly menace' during summer was one of the rationales for enclosing the sleepout in flywire, but this also admitted another potential problem, that of house burglars which became regular concern for homeowners.[28] The exclusion of mosquitoes was a further anxiety with some diseases known to be transmittable through this vector.[29]

While the variation in materials from the main house to the sleepout may to today's eyes seem to imply they were a later addition or alteration, it was not uncommon for them to be purpose-designed as an integral part of original designs in the 1930s.[30] South Australian architects whose designs for freestanding houses and flats incorporated sleepouts in their original plans included Gordon Beaumont Smith, Harold Griggs (Figure 1), Russell Ellis, and Lawson and Cheesman Architects. An example is the home which architect Keith Yelland (1900-1973) designed for his brother Dene in Hyde Park in 1936 which included a sleepout at the rear of the house with part flywire walls to enable the flow of fresh air (Figures 2 and 3).

The Yelland House is Spanish Mission in appearance, a style which was perceived to be suitable for the South Australia by columnist John Adelaide, 'because of the fact that it has been evolved in a Mediterranean climate which closely approximates our own.'[31] Despite this, Adelaide architects reportedly ultimately saw the bungalow as more suitable.[32] The sleeping porches which were commonly found on Californian Bungalows reflected the practice of outdoor sleeping which *Building* magazine estimated extended to fifty percent of Australian houses by the early twentieth century.[33] The architect's drawing of the Yelland house shows how the sleepout at the rear of the opened directly from a bedroom with two walls of double brick and two of lightweight framed construction infilled with sheeting and flywire with a skillion roof of corrugated sheeting. The size of a small bedroom, the sleepout measures 14 feet by 9 feet. However, sleepouts could be found in complexes of flats as well as freestanding houses and were promoted as a 'modern' element of residential design with the modern architectural language also enabling their incorporation.

24. "Garage and Sleep-Out Time: Build Now," *Mail*, (16 October 1937): 30.

25. "The Sleeping-Out Craze," *Building*, (12 July 1911): 86.

26. "Correspondence," Register, (15 November 1928): 5; "Queries from Readers Answered". *Advertiser*, (15 November 1939): 7.

27. "Correspondence," 5.

28. "Construction of Fly Wire Screens," *Mail*, (10 October 1936): 27; "Week-End Thefts", *Advertiser*, (18 May 1937),:13.

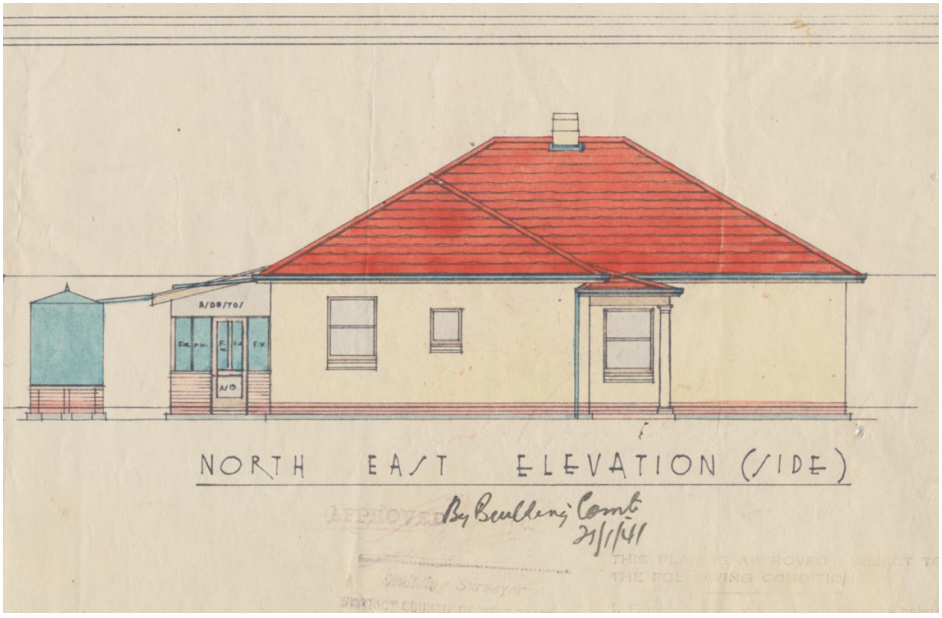
29. Baldwin 2003: 421.

30. A.C.S., "The Home Maker's Page," Advertiser, (15 November 1939), 7; "Architect Builds Own Home," Mail, (4 January 1936): 10; "Modernity in Home Planning," *Mail*, (23 July 1938): 34.

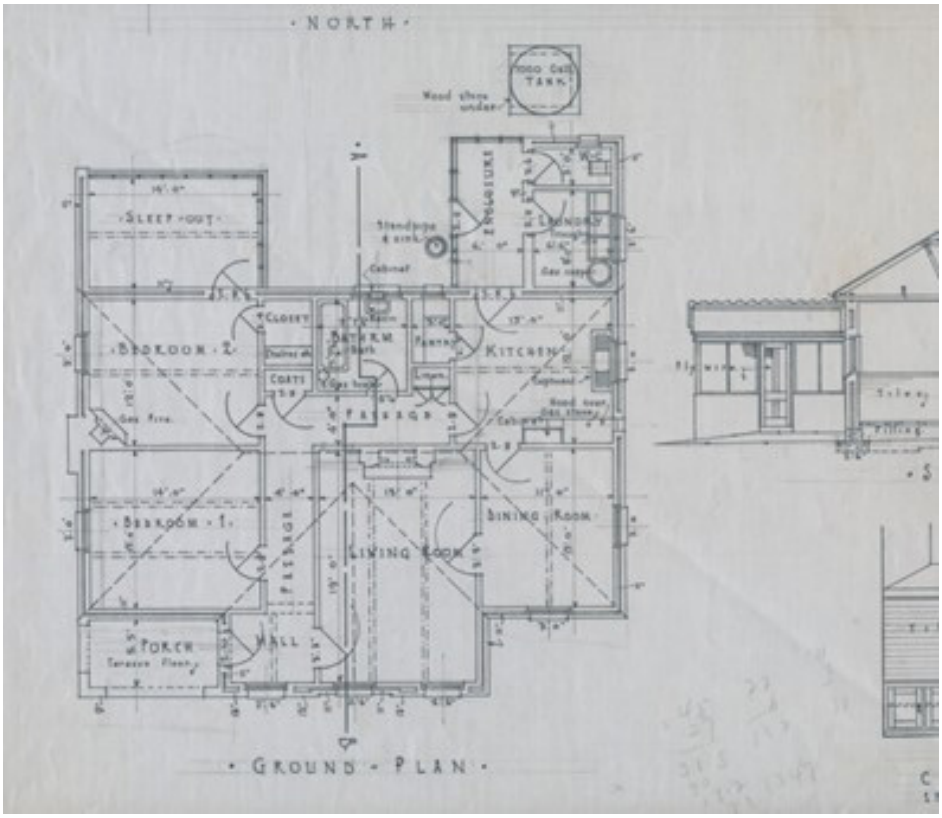
31. J. Adelaide, "Period Home or Modernist," SA Homes and Gardens (1934).

32. "More Enterprise in House Design," *Mail*, (16 April 1938).

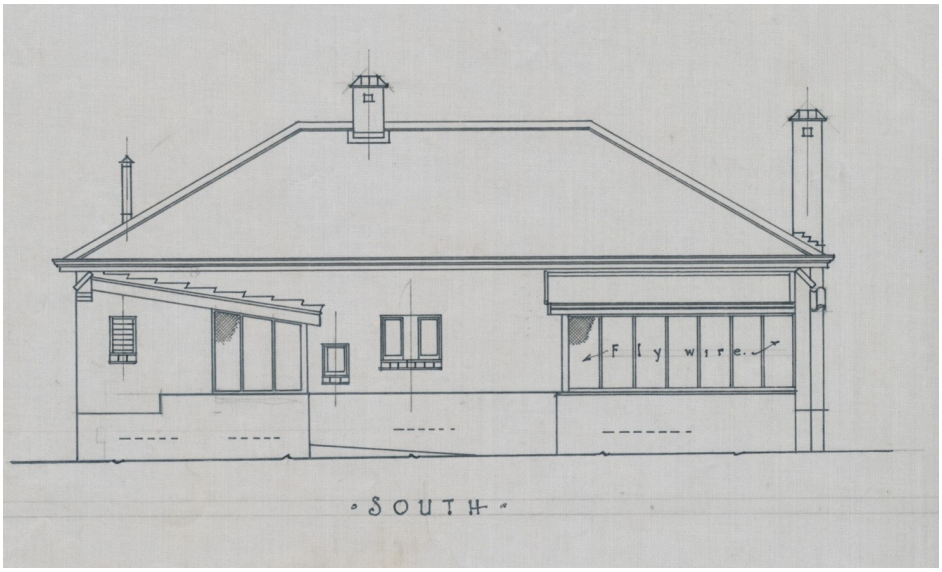
33. J. Clare, "The Californian Bungalow in Australia," *Historic Environment*, 1 (1989): 19-39.



Figures 1: Typical sleepout at rear of maisonettes, Grassmere, 1940, by Harold T. Griggs, architectural drawing, Griggs collection, S167/746, Architecture Museum, University of South Australia.



Figures 2: Dene Yelland House, Hyde Park, 1936, by Keith Yelland, plan, architectural drawing, Russell and Yelland collection, S98, Architecture Museum, University of South Australia.



Figures 3: Dene Yelland House, Hyde Park, 1936, by Keith Yelland, rear elevation, architectural drawing, Russell and Yelland collection, S98, Architecture Museum, University of South Australia.

Sunrooms and Solaria

At the turn of the century architect and town planner Raymond Unwin had recommended that 'every house should turn its face to the sun, whence comes light, sweetness and health.'[34] With their roots in part in hospital solaria, the adoption of sunrooms in domestic settings was widespread in the 1930s both in Australia and abroad. Sunbathing was seen as a fashionable part of a healthy lifestyle with newspapers in 1938 claiming 'We are all Sun Worshippers These Days'.[35] While phrases such as getting one's 'daily doses of sunlight'[36] and the 'New Cult of the Sun' peppered the media,[37] the sunroom was seen to be a 'concrete recognition of this … [and an] adjunct of most modern houses.'[38] British surgeon and tuberculosis specialist Sir Henry Gauvain was a great advocate of heliotherapy, stating that 'Sunlight stimulates and enlivens, it is of help in almost all conditions'.[39] The effect of sunlight on forms tuberculosis other than pulmonary, as well as diseases such as lupus and skin ulcers was praised in the Australian press with bathing dresses and seaside sunbathing promoted.[40] In the modern period sunlight was also seen as 'a germ killer'[41] and the penetration of sunlight into buildings was deemed important as it could kill many bacteria living in dust particles even though it had no effect on diseases such as tuberculosis while they survived in the patient.[42]

In 1938 in the beachside suburb of Glenelg a block of six 'modern' flats called 'Retten' were designed for businessman Alfred Netter by architect Harold Griggs (1899-1902).[43] The cement rendered block contained six flats, three on each floor, with each of the individual flats comprising a living room, bedroom, kitchen, bathroom and sleepout, with some also having a sunroom or solarium. While sleepouts were predominantly located at the rear of the home with fresh air the goal, sunrooms were placed on any side of a residence which could gain direct sunlight, including the front, and were glassed in rather than using mesh screens. Griggs designed in many styles, including the modern[44] and within his body of work are many houses which include sleepouts, sunrooms

34. R. Unwin, *Cottage Plans and Common Sense*, (London: Fabian Society, 1902).

35. R. Lee, "We Are All Sun Worshippers These Days," *News*, (18 May 1938): 9.

36. Lee, "We Are All Sun Worshippers These Days", 9.

37. "New Cult of the Sun – Has your house a solarium?" *Advertiser*, (14 July 1937): 13.

38. Lee, "We Are All Sun Worshippers These Days", 9.

39. Times, 11 May 1922 cited in R.A. Hobday, "Sunlight Therapy and Solar Architecture," *Medical History* 41, no.4 (1997): 466.

40. "Sunlight and Tuberculosis", *The Australian Woman's Mirror*, (4 October 1927): 17.

41. G.S. Jones, "Australia and Civic Art: A Factor in National Life," *Architecture,* 2, no.4, (October 1917): 85-89.

42. Hobday, "Sunlight Therapy and Solar Architecture."

43. "Retten Flats," *Advertiser*, (11 May 1939): 17.

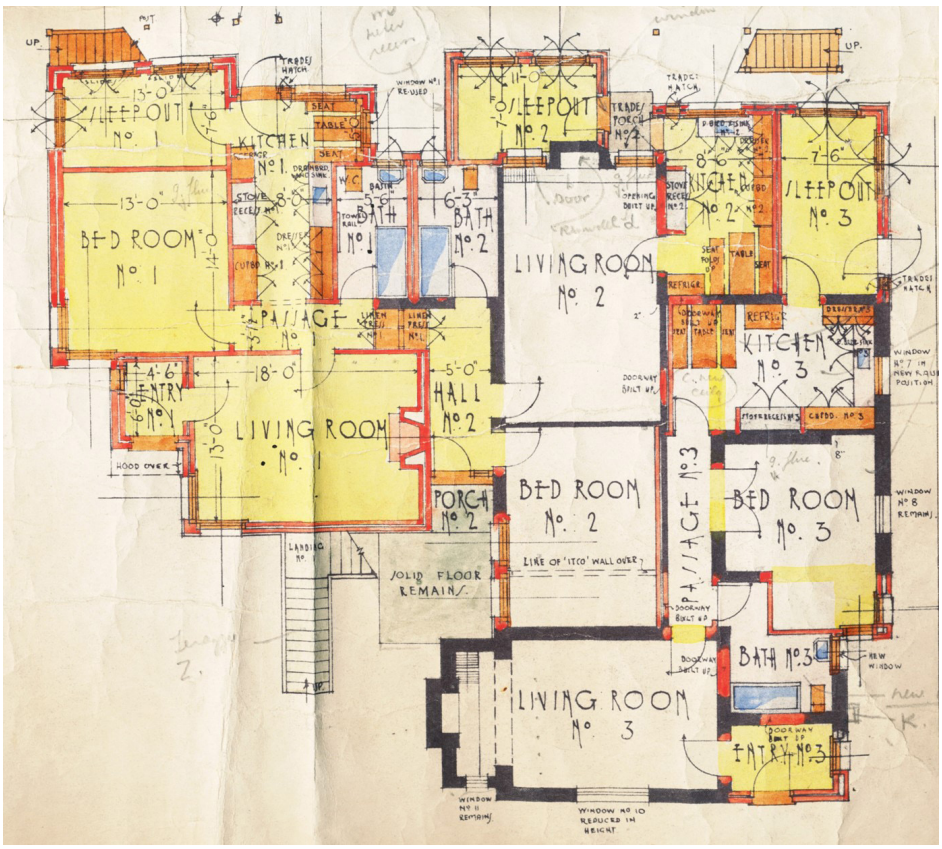
44. M. Cooper-Dobbin, *Harold T. Griggs: The People's Architect*, Architecture Museum Monographs, (Adelaide: University of South Australia, 2010).

and solaria as part of their original layout.[45] In 'Retten' (Figures 4 and 5) it was the solarium which gained much attention from the press. In a full-page advertising feature for the flats published in 1939 the plate glass enclosed solarium was described as 'Pre-eminent … that spacious glass-enclosed area which surmounts the building, and from which one has an uninterrupted view of the coastline, out to sea, and the distant hills.'[46]

Figures 4: Retten, Glenelg, 1938, by Harold T. Griggs, undated photo, private collection.

45. Harold T. Griggs collection, S167, Architecture Museum, University of South Australia.

46. "Retten Flats", 17.



Figures 5: 'Retten' Flats, Glenelg, 1938, by Harold T. Griggs, first floor plan, Griggs collection, S167/546, Architecture Museum, University of South Australia.

The activities which sunrooms were designed to cater for were generally recreational in nature with 'reading, writing, sewing and games' among them. In 1938, the furniture which was recommended for a sunroom included cupboards for:

> 'folding bridge table and chairs, one for drinks, a drawer for cards and games, a hinged flap at which one can write a note, with pigeonholes above for writing gear, a plug for wireless, plugs for lamps, plug for radiator, and plug for telephone.'[47]

47. "Make Most of Sunroom: Healthy Place for Varied Activities," *Mail*, (4 December 1937): 47.

Sunrooms have also been documented as playrooms for children.[48] As lounging or sitting was a suggested activity, it was recommended that fenestration cater for this, with 'ideal windows … low down near the floor so that one can get a good view even from a low chair or lounge mattress.'[49] In 1933 Geoffrey Mewton in the *Australian Home Beautiful* reported that 'in Germany and other countries in Northern Europe the desire for sunlight is astounding. Everywhere there are large windows or long horizontal rows of them.'[50] However there were notes of warning sounded in the press against the 'holus bolus' adoption of the sunroom or solarium with the Australian climate, especially during summer, the main inhibiting factor.[51]

48. 'Deepacres,' North Adelaide," *SA Homes and Gardens*, (2 August 1943).

49. "Make Most of Sunroom: Healthy Place for Varied Activities," 47.

50. G. Mewton, "Modern and Medieval: An Australian's Impressions of Architecture in Other Countries," *Australian Home Beautiful*, (2 January 1933), 14-16.

51. "New Cult of the Sun – Has your house a solarium?" 13.

Sundecks and Terraces

The solarium on the top floor of the flat roofed 'Retten' opened by way of French doors onto an adjacent sundeck. In a typescript on 'Flat Roof

Construction', Griggs states that 'Healthy homes depend on sunshine, light and air', suggesting that tennis courts, play areas, or promenades could be uses of rooftops.[52] This echoed Banister Fletcher's 1900 address in which flat roofs were proposed as spaces which could be used as playgrounds, gardens, terraces and for sports, as well as for taking 'afternoon tea on the roof', in the 'cool breezes generally obtainable at the height of a five-storey house, with a view.'[53] The movement towards leisure was reflected by society columnist Ruth Lee, who in 1938 wrote, 'It's all part of the new era that is dawning to enjoy life more, to stop in our everyday rush and see the good things of life that are within our reach - sunlight and gardens and peaceful relaxation.'[54] The rooftop sun deck at 'Retten' proved popular, as a subsequent alteration demonstrates with the addition of a small deck outside of a first floor flat.

Flat roofs, sundecks, terraces and balconies featured in many modern houses, enabling the 'modernist enthusiasm for health and sun worship' experienced on holidays to continue on the return home.[55] In 1933, Mewton, in the *Australian Home Beautiful* explained that in Europe 'Most of these new houses have flat roofs … Sometimes there are roof gardens, but mostly the roofs are used as loggias and for sun bathing.'[56] The popularity of the sundeck can be seen in the home designs entered in the Building Industry Congress of Victoria, Centenary Homes Exhibition competition of 1934, which received wide publicity across the country, with South Australian architects including Russell Ellis entering designs. Overall, the designs were perceived to be following modern trends, with architect W.A.M. Blackett noting that 'The chief element of difference is the wide adoption of the flat roof, a very desirable feature as affording useful space for sunning and exercise'.[57] The following year, the term 'open air deck' was used by *Australian Home Beautiful* writer, Esmé Johnston,[58] recalling the terminology popularised with open-air treatment for tuberculosis. As well as their use during the day for sunbathing and recreation, sundecks were also seen as able to function for the purpose of sleeping out at night.[59]

Sundecks located on top of flat roofs were praised in South Australian home magazines as utilitarian features which appealed to 'home-makers who are devotees to the healthful out-of-door living cult'.[60] One of the practitioners of modernism in South Australia, was Russell Ellis (1912-1988) who has been noted as being responsible for some of the early examples of modern homes in the state as well as period or conventional designs.[61] Ellis' Hardy house at Netherby featured the functional planning Ellis was to praise in a series of articles he wrote for *South Australian Homes and Gardens* in which he advocated open plan layouts and large windows in service of the 'ideal of open, healthy living'.[62] The Hardy house which was designed for artist Audrey Hardy in 1938 provides an example of the modern sundeck roof terrace. Enclosed by a metal railing the expansive sundeck was labelled on the plan as a 'promenade deck' and accessed from the upper floor studio space (Figures 6 and 7). The Hardy house exemplifies how the planning of space, use of new materials, minimal ornamentation, open, light, and bright spaces, coalesced into the aesthetic associated with modernism and healthy living.

52. H.Griggs, 'Flat Roof Constructions' typescript, c.1940, Griggs collection, S167/687, Architecture Museum, University of South Australia.

53. Fletcher, "The architecture of the twentieth century from the point of view of public health," 18, 17.

54. Lee, "We Are All Sun Worshippers These Days," 9.

55. M. Campbell, "From Cure Chair to 'Chaise Longue': Medical Treatment and the Form of the Modern Recliner," *Journal of Design History* 12, no.4 (1999): 327.

56. Mewton, "Modern and Medieval," 14-16.

57. W.Blackett, "The Centenary Homes Exhibition. A Critical Survey of the Plans and Designs," *Australian Home Beautiful*, (1 December 1934): 11-13.

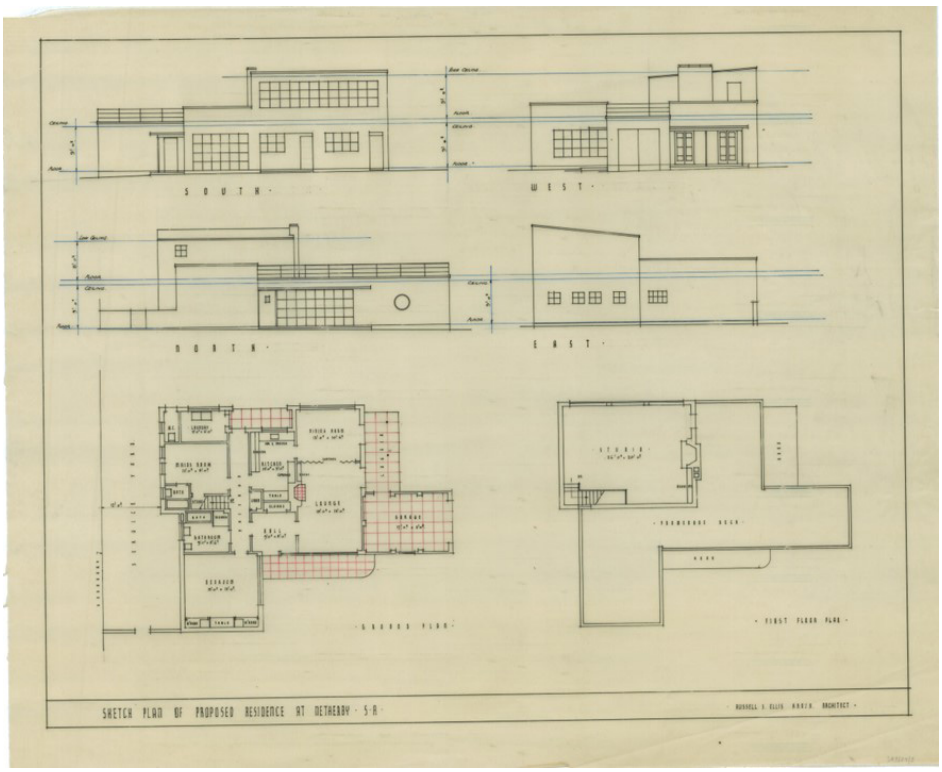
58. E. Johnston, "Horizontality: A New Note in Domestic Architecture," *Australian Home Beautiful*, (1 June 1935), 6-9, 48.

59. "A Modern House with Homely Character," *South Australian Homes and Gardens*, (1 October 1942): 16.

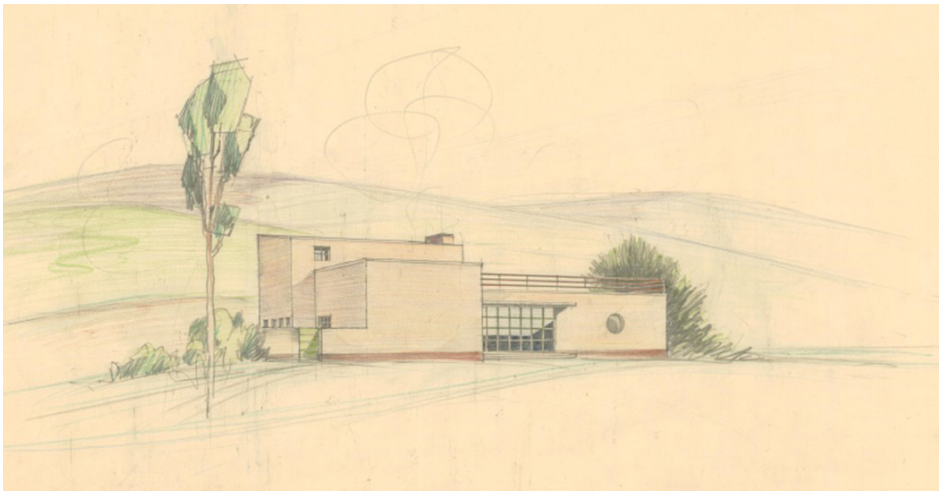
60. "Modern Home Erindale," *South Australian Homes and Gardens*, (1 November 1940): 20.

61. L. Bird, *Russell S. Ellis: Pioneer Modernist Architect*, Architecture Museum Monographs, (Adelaide: University of South Australia, 2007).

62. R. Ellis, "Thoughts on Planning the Immediate Post-war Home," *South Australian Homes and Gardens*, (1 September 1945), 28.



Figures 6: Hardy residence, Netherby, 1938, Russell S. Ellis architect, elevations and plans, architectural drawing, Ellis collection, S89/24, Architecture Museum, University of South Australia.



Figures 7: Hardy residence, Netherby, 1938, Russell S. Ellis architect, perspective, architectural drawing, Ellis collection, S89/24, Architecture Museum, University of South Australia.

Conclusions

63. P. Overy, *Light, Air and Openness*, (London: Thames and Hudson, 2007), 9.

By the mid twentieth century modern houses were displaying what architectural historian Paul Overy called a 'preoccupation with cleanliness, health, hygiene, sunlight, fresh air and openness.'[63] The qualities which were deemed necessary to improving public health such as increasing the penetration of fresh air into the home were foreseen by earlier architectural commentators, with the architectural elements necessary predicted in some of the medical visions from the turn of the century. In houses and flats, large openable windows and doors, abundant ventilation, verandahs and balconies, narrow wings, adequate

space around houses, outdoor courtyards, and landscaping, were all architectural responses to health concerns around air flow, with the open-air sleepout perhaps the most apparent resulting design solution.

It has been found that while the Australian climate is a contributing factor behind the incorporation of sleepouts, sunrooms and sundecks, health was equally a driving rationale behind their integration in residential buildings. The desire for what was seen as germ killing sunlight was also enabled through large expanses of plate glass, lack of eaves, and the incorporation of sundecks and solaria. This research has also demonstrated that while the materiality of sleepouts and sunrooms can sometimes point to them being a later alteration or addition, some of them were part of original plans by architects specifically designed for purpose. For those who couldn't afford to have architect designed sleepouts and sunrooms, there was encouragement and instruction in local home magazines and newspapers to help people design and build their own DIY version.

Many of the health-related design features in buildings of the early twentieth century have shaped the way we think of modern architecture, with abundant access to fresh air, open spaces, and plenty of sunlight all demonstrating this. While the understandings and context for these buildings has changed dramatically since they were designed and built, the legacy of their existence, and the imprint they have left in our environments, histories and memories remains. It is worth considering how once diseases such as tuberculosis were conquered in Australia through pharmacological treatments and vaccines, one of the initial purposes behind the use of sleepouts, sunrooms and sundecks for healthy open-air sleeping and living, changed, and these spaces became more associated with leisure and comfort, especially in relation to climatic variations. During the early twentieth century architects engaged with the medical profession, municipal councils, public health officials, and homeowners, to design places that aimed to enable health as well as prevent disease while medical scientists were working on the search for treatments, cures, and preventative measures to take the global population through the century.