

The 'Essentials' Of The Sub-tropical House: An Exegesis Of The 'Modernistic' Town Planning Principles

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In *Sub-Tropical Housing*, a small booklet published in 1944, Dr Karl Langer stakes a claim for a revision of the design of sub-tropical housing. To support this claim a number of house plans, neighbourhood allotment arrangements and a proposal for a community of 2000 inhabitants are presented as solutions for problems pertaining to what are described as "the essentials of a sub-tropical house". These problems are identified through a scientific-like consideration of what is defined as three "basic human needs: The Avoidance of Fatigue; Provision of Light and Avoidance of Glare; and Economy".

In the concluding remarks it is claimed that although tempted, there is no discussion of aesthetics. However, at pains to emphasise the impossibility of separating housing from town planning, Dr Langer presents his solutions with a legible design consistency across varying scales. Furthermore there is an abstract quality in the detail house plans and neighbourhood arrangement that suggests strongly a 'modernist' solution to the problems stated. This paper examines the architecture presented in the booklet and its idiomatic relation to the work of Dr Langer. It is suggested that a number of characteristics in the work can be read as particularly 'modern' in form and intent.

Sub-tropical Housing is a technical design guide written in 1944 addressing the specific local climatic conditions of Brisbane and was notable and influential from the mid 1940s well into the 1960s. It was written by the Austrian émigré Dr Karl Langer who with his wife Gertrude fled Vienna for Greece and finally Australia in 1938. Folklore has it that most Brisbane architects during this period had copies of the booklet in their offices.¹ The implication being it was central to the dissemination of modernity in Queensland. Its significance can be framed in terms of the particularly modern basis with which it addressed the problems of house design and town planning in a sub-tropical climate. In this sense it was an early local example of the use of systematic scientific data to inform architectural and town-planning design principles.² As it was one of Dr Langer's few publications this significance is transformed by the symbolic role the booklet has played since as a tangible reminder of the important place Karl Langer holds in the architectural history of Australia and in particular Queensland.

The degree of importance is less clear today but was considerably comprehensive up until his death in 1969. His teaching in architecture and landscape architecture was highly influential and impressed a view framed in the canon of modernity on a generation of local architects³. John Gorton, when Prime Minister; appointed him Vice-Chairman of the Music Board of the Australia Council. He played key roles in the establishment of the Royal Australian Planning Institute and the Australian Institute of Landscape Architects as well as executive roles in the Royal Australian Institute of Architects and in Queensland: the National Trust, Arts Council and Art Gallery Society.⁴ "And in spite of the best efforts of a very parochial State bureaucracy, his reputation and his activities spread quickly across Australia, from Mackay to Sydney to Canberra to Perth, and he was commissioned for major town planning consultancies in all these places."⁵ Most notably he was the consultant who in February 1948 selected Bennelong Point as the site for the Sydney Opera House Competition.⁶

Self-evidently Modern

The breadth of Langer's vocational interests was considerable spanning architecture, music, art, planning, landscape, horticulture, architectural science, mathematics, physiology and engineering. By way of underscoring his importance, these interests coupled with a desire to transform and invent have been suggested by the Queensland academic Ian Sinnamon as analogous of the renaissance "Universal Man."⁷ Born in 1903, Karl Langer undertook postgraduate study at the Academic Masters School of the Vienna Academy of Fine Arts run from 1922 to 1936 by Peter Behrens for whom he later worked and subsequently ran the Behrens' Viennese office⁸ before establishing his own practice. The work of Behrens' students, including Langer, was exhibited in 1926 to considerable acclaim.⁹ He was a member of the Guild of Austrian Architects and won competitions as a student and in practice.¹⁰ His own work in Vienna in the 1930s received favourable reviews. Dr P.W. Born in an overview of Austrian architecture and decorative art published in 1935 in the English journal *Design for To-Day* refers to Langer as "(a) young and

gifted architect."¹¹ Born's article illustrates a doctor's consultancy interior by Langer described in the text as influenced by Eastern abstraction "translating its spirit into functionalist forms."¹²

Interest in the Orient, which remained with Karl and Gertrude Langer as an enduring legacy, owes something to the innovations in teaching the 'elements of form' initiated by Behrens' *Vorbereitungsklassen* at the Düsseldorf Kuntsgeweberschule in 1903.¹³ However the "functionalist forms" of Langer's doctor's consultancy project: elegant tubular steel chairs and stools, unorthodox use of translucent glass in joinery and spindly light fittings suggest his aesthetic leanings towards a modernist orthodoxy rather than maintaining lineage with Behrens' 'functionalism through craft expression.'¹⁴

A student competition scheme,¹⁵ "124816," for a villa set in a 'seidlungesque' grouping drawn during this period illustrates the intentions of the young Langer. The scheme owes formal characteristics to Behrens' Kurt Lewin house (1929-1930)¹⁶, however the logic of the planning and overall simplicity is in keeping with the more progressive exemplars of the Deutscher Werkbund exhibition: Weissenhof, Stuttgart where Behrens own contribution *Terrassenhaus* (1926-1927) was criticised for poor internal planning and 'forced' formal resolution.¹⁷ Furthermore there is evidence in the detail planning of "124816" of an interest in 'total' site design beyond the ubiquitous cubic International Style of the villa's form. Langer it would seem was firmly engaged in what Born describes as "Functionalist Theory" as opposed to the "Neue Werkbund Osterreichs" whose 1934 exhibition 'Das befreite Handwerk' showcased furniture and decorative art work opposed to modern industrial products.¹⁸ The extent to which further refinement and complexity is brought to this milieu is borne in the rigor and maturity of *Sub-tropical Housing* as a compelling total proposition and hints at the Australian oeuvre that would encompass teaching and unheralded innovations in town planning, municipal buildings, schools, offices, commercial buildings, houses, hotels and the new industry of tourism.

A Modern Methodology

In its brief 24 pages, *Sub-tropical Housing* presents a coherent framework for responding to the influence of climate in a determinedly modern manner¹⁹. It is divided into two parts.

The first deals with the question concerning "the essentials of a sub-tropical house" and the second speculates on whether there are "other forces that influence design". The methodology adopted for "the essentials" relies on framing the problem of adapting houses to suit climatic and social conditions in abstract terms that address what are described as three "basic human needs." These are categorised as "The avoidance of fatigue," "provision of light and avoidance of glare" and "economy."²⁰ Langer claims these "needs" are intrinsic to sub-tropical regions in addition to other common universal constraints that affect dwelling and settlement.²¹ Statistical information from a diverse range of research including medical science, astronomy, climatology, physics

and contemporaneous developments in industrial technology are orchestrated to support a series of hypothetical design propositions. These in turn are studied in various small neighbourhood combinations and developed into a "specimen layout" for a community of 2000 inhabitants based on Clarence Stein and Henry Wright's Radburn Plan, New Jersey of 1928 described by Langer as a universally accepted principle.²²

By making reference to the American social theorist Thorstein Veblen, Part II is anecdotally framed as a cautionary reminder to not abandon the scientific determinates of dwelling that address or shape "needs" in favour of the cultural aspirations of class and status seen as potentially undermining the character; and by extension, value, of building form.

Though Langer's booklet would appear to be one of the first it was by no means the only publication at this time to examine the pressing need for a reconsideration of the problems of house design and town planning that could be considered more relevant to an Antipodean setting. For instance Ernest Fooks published *X-Ray The City*²³ in 1946 and Robin Boyd, *Victorian Modern* in 1947. Other notable publications at this time were Walter Bunnings's *Homes in the Sun* (1945), and Ernst Plischke's *Design and Living* (1947). These last two texts share with Langer a consistent form and structure in aligning a modernist solution to efficient and 'appropriate' house design and the interconnectedness of house design to town planning as well as a similarity if not uniformity in the particular models adopted. What is of interest is the manner in which Langer attempts to codify his model through a scientific methodology.

In the Foreword by Dr H.C. Coombs, the Director-General of Post-War Reconstruction, *Homes in the Sun* is described as "an example of the way in which intelligence and understanding can be applied to the day to day problems of living in a way which will not merely increase comfort and convenience but will also incorporate simplicity and grace in design."²⁴ In publishing *Homes in the Sun*, Bunning who had been Executive Officer of the Commonwealth Housing Commission during World War II, like Langer, makes a case for climatically responsive design and town planning based on social-democratic community needs.²⁵ Bunning's "sun trap" houses,²⁶ shown as plans and cut-away isometric views of linear L-shaped arrangements with tall modern flat roofs bear similarities to Langer's house plans in that they are proposed as minimal (economic), able to be extended and are distinctly modern in their consolidated planning and character. There is a nine-point list of 'principles' of house planning that correspond with the sentiment of Langer's more abstract categories. These are organised within a system of programmatic modules including furniture and light fittings. Like Langer, Bunning models his town plan communities on Stein and Wright's Radburn Plan of 1928.²⁷ Central to these models are various proposals for Community Centres with adjoining town squares adjacent green recreation spaces with green pedestrian 'fingers' connecting neighbourhoods as 'super blocks.'²⁸ There are various examples of suggested possibilities

for large-scale pre-fabricated State controlled development to address the chronic housing shortage and haphazard urban growth. *Homes in the Sun*, cites schematic proposals for Yallourn, Fisherman's Bend and elsewhere though these are more a summary of places of identification where the proving of the text may take hold. In general the content of the book remains an overview of the benefits of modernism as a paean for the problems of the times.

In 1946 the Auckland-based 'architectural group' published *planning*, an occasional magazine whose aim was "discussion and propaganda."²⁹ Issue 1, August 1946 contained an extract, 'design and living' by the Viennese émigré Ernst Plischke. This was a preliminary three-page sketch of an expanded publication of the same name published the following year.³⁰ Linda Tyler's account of Plischke's background and circumstances bears a remarkable resemblance to Langer's.³¹ Plischke was born in 1903, the same year as Langer, had been taught by Behrens and worked briefly in 1926 in Behrens office in Vienna. And in the new world they both had to sit out the war years in menial roles as draughtsmen.³² *Design and Living* like *Sub-tropical Housing* aimed to instruct the value of design at all scales from furniture to towns. And like Langer there is deference to the rôle of aesthetics.

"The utilitarian and the aesthetic approaches to planning are not fundamentally opposed. The difference is one of emphasis only. It can never be one of principle, because neither aspect can possibly be excluded in any good design...so that the early remarks in this booklet, about the design of a chair, can equally well be applied when, at the end, we come to plan a town."³³

Plischke's book, more substantial in scope (it runs to 92 pages) than *Sub-tropical Housing* though not more detailed in terms of research, follows a similar model to Langer and Bunning: the incremental development from small scale elements of furniture to room to house where concerns for access of light and sun, some of the particular characteristics of the New Zealand landscape: views and wind, efficiency of planning and economy all act as a set of principles that are aligned to reveal the vagaries of stylistic shortcomings evident in the speculative bungalows of suburban development.³⁴ Although this polemic in itself resonates with Robin Boyd's critique of styles in *Australia's Home*³⁵ there is a broader aim to illustrate how this coordinated response can offer solutions of a distinctly modern nature to the particular problems of the century.

Turning to towns, Plischke presents an expanded view on the nature of city form that includes a lengthy discussion on physical town planning aesthetics based on the work of the Viennese urban theorist Camillo Sitte.³⁶ Plischke's call for the design of town squares, identified as asymmetric nodes enclosed by building form, notably key community buildings, is consistent with Langer's renowned lectures on Sitte whose accounts of the Piazza San Marco and Venice in general align with Plischke exactly.³⁷ The two owe an obvious debt to Behrens whose views and teachings on Sitte were influential, for example, in the

masterplanning and design of the AEG Humboldtthain factory (1909-1910) Behrens who, Stanford Anderson describes as "delighting in broken silhouette" and "picturesque projections"³⁸ acknowledged his own debt to Sitte;

"Because of the practical necessity of recession (of form), the group acquires an effective silhouette, and due to the necessary arrangement of courts, a requirement of that old master of city planning, Camillo Sitte, is complied with. Sitte pronounces plazas enclosed by building units one of the most essential elements in creating artistic effects in city planning."³⁹

In a pattern that mirrors Langer and Bunning, Plischke then goes on to promote and describe a number of town planning proposals with distinctly Radburn-esque qualities,⁴⁰ such as the government housing development at Trentham by the Housing division of Public Works.⁴¹ This is augmented by Sitte-esque proposals for a Civic Centre for Naenae near Wellington by the Department of Housing Construction,⁴² and a Community Centre at Mount Roskill, Auckland.⁴³ Plischke's intent is partly a critique of the gridiron block of the colonial city, whose abstract geometrical form denies the potential of the community to gather in ways appropriate for contemporary circumstances.⁴⁴

"...a clear differentiation between requirements of vehicular and pedestrian traffic is attempted...the service lanes serve as access drives to houses only. Each cul-de-sac leads towards the large central recreation reserve and is linked with it by a pedestrian footpath...All the schools and kindergartens border the reserve as well as the road, so that children can go to and from school without crossing the traffic road...The pedestrian will no longer have to follow the usual gridiron or the ribbon street system. Pleasant walks through the park would be part of everyday life. Main shopping centres are centrally placed... (and so on)"⁴⁵

This view mirrors with Langer's; that in town planning: "...distances should be measured in walking minutes rather than chains...and the shopping centre, elementary school, kindergarten, swimming pool, playgrounds, library, health-centre and bus-stop can all be reached in not more than ten minutes without crossing any road used by vehicles"⁴⁶

Underscoring this interest in combining the figured space of Sitte's aesthetic principles and modern planning is what Linda Tyler eloquently describes as "typically Modern tensional opposites"⁴⁷

It is not conclusive whether Plischke and Langer knew each other or the full extent of their work in Vienna, Australia or New Zealand.⁴⁸ Langer and Bunning did maintain correspondence but none published subsequent work that followed such coherently similar structure and objectives.⁴⁹

It is not the aim of this paper to suggest authority or precedence between Langer, Bunning or Plischke. The milieu of the time plausibly contributed to a consistency in objective and approach that could be expected from several commentators. They were writing in a period where the urgency to attend to the transformation of cities was pressing and an

orchestrated coordination of solutions across scales of planning and building had attractions. In a similar manner the possibility of a new idiom contributing to this coordinated approach had obvious currency not only for its newness suiting the rhetoric of the approach: economy in plan and construction and so on; but the opportunity to set aside the upheaval of the immediate past must have understandably seemed too compelling to ignore. As Harry Margalit has discussed, the "reformist zeal" of the immediate post war era had been silenced by the "roar of prosperity in the 1950s."⁵⁰ Bunning was soon back in private practice and Plischke had by 1963 returned to Austria and a distinguished academic career.⁵¹

Langer's method however is striking for its role in pronouncing authority on the principles that were being promoted in all three publications. And in this, *Sub-tropical Housing* contributes to a potentially more rigorous account of the claims of modernity. Bunning, perhaps mindful of a bureaucratic audience, adopts a 'policy-like' method of drawing on numerous, mostly international, precedents to support his argument⁵². Plischke, on the other hand, writing in a manner suggestive of appealing to a lay readership, eschews the detail of precedent and presents his argument with an almost evangelical rhetoric. For example in describing the virtues of revising urban form and the role of community centres with a clearly Radburn-esque strategy, he stretches his point: "Except for one or two American schemes for housing war workers, there does not yet exist one new town of this kind in the world."⁵³ Compare this with Langer's straightforward assertion of the then 16-year-old precedent of Radburn as a "universally accepted principle."⁵⁴

Langer is at pains to identify through his "essentials" reliable supporting data and information that are immutable and objective to the degree that aesthetics can have no room in the discussion. His principles are derived from findings intrinsic to sub-tropical conditions that relate the body: 'Fatigue' to conditions of the natural world: 'Glare' and culture: 'Economy.'

At the core of this endeavour is an attempt to expose the failings in the vernacular and present a more suitable alternative based on empirical information.

In "A. The Avoidance of Fatigue"⁵⁵ a summary of domestic energy consumption drawn from medical research is tabled to 'prove' merely doing nothing is the biggest tax on human energy and with it fatigue comes in the sub-tropics from a loss of blood supply to our organs as the respiratory system attempts to cope with heat exchange. With muscles unable to perform well, unnecessary physical activities contribute to a sense of fatigue. Langer uses this information to bolster a variety of arguments: open efficient floor plans with small simply designed kitchens help reduce walking; all activities can be maintained on ground level eliminating the need for more walking (upstairs); "In causing strain, a staircase is the equivalent of a corridor a hundred feet long. Two storied houses, then, would appear to be unsuitable for this climate. (For the same reason, it is undesirable to build houses on high stumps.)"⁵⁶

Furthermore the line of reasoning informs town-planning criteria – Langer’s recommendation to ‘shape’ towns on distances measured in ‘walking-minutes’ in response to diminishing unnecessary ‘effort’ accords with the writer David Malouf’s account of the effects of walking in Brisbane:

“The first thing you notice about this city is the unevenness of the ground.... Wherever the eye turns here it learns restlessness and variety and possibility, as the body learns effort. Brisbane is a city that tires the legs and demands a certain sort of breath.”⁵⁷

As has been mentioned, this recommendation finds its corollary in the “universal principle” of the Radburn Plan. Other measures to reduce heat gain led Langer to consider the problem of orientation and shade and from first principles he developed a unique ‘gnomic’ sun path chart for Brisbane to aid in the correct calculation of shading devices.⁵⁸

In “B. Provision of Light and Avoidance of Glare”⁵⁹ further problems with the vernacular are identified: “...people⁶⁰ living in the semi-tropics find glare in the houses very trying. To overcome this they reduce the window-area, and ‘protect’ the house with verandahs, blinds, curtains, etc. this remedy has two defects: firstly, it makes the rooms so dark that most activities are transferred to the verandah, and secondly, surprising though this may seem, the effect of glare within rooms is increased”⁶¹

Physiological and physical science in the form of diagrams of light intensities and wind pressure⁶² are published to provide evidence for opening views to outdoors through apertures made as large as possible to reduce the effects of glare. An external aspect of at least 20 feet is considered ‘comfortable’ and windows the size of room walls reduce the discomfort of glare, as long as effective shading can be maintained. This in turn assists ventilation and reinforces the pre-eminence of orientation in site planning.

In “C. Economy”⁶³ Bureau of Industry statistics are provided to reinforce earlier recommendations for “soil-cement slab” construction and simple efficient modular plans capable of being extended as anticipated affluence increases.

From these “essentials” five house plans⁶⁴ are generated seemingly as the ‘result’ of the data yielded by the principles: simple plans (often in an ‘L’ configuration) of slab-on-ground structures with large unimpeded openings onto generous garden spaces. ‘Heavy’ walls are coordinated as much with garden/hedge design and western orientation as with the formal house layout. Each plan has a combined north-point/wind-rose with notes identifying optimum orientation. These plans are in turn re-presented in various neighbourhood-like clusters based on plan permutation and orientation.⁶⁵ This is done perhaps as an indication of ‘testing’ (as with a scientific hypothesis) in order to underscore the reliability of the original arrangements when placed under adverse or contradictory conditions and also to ‘predict’ the preferred orientation of blocks and streets.

The result is remarkably consistent and decidedly modern in form and process: a kind of ‘pure’ design free of stylistic association informed by ‘neutral’ sci-

tifically determined constraints to meet the minimum requirements of human needs. Among subsequent town plan projects; a competition in Westmead, Sydney (date unknown) and a development proposal for Hackett, Canberra (1966) indicate the principles had endured.⁶⁶

In Part II “What Other Forces Influence Design” the situation is less clear in the light of the rejection of a discussion of aesthetics. This is particularly instructive when we see Langer embark on a discussion of the “consumption” of culture through the display of taste, he opts for a less empirical and more anecdotal methodology, arguing against applied “features” of status at the cost of “universal human needs for comfort, convenience and spaciousness.”⁶⁷ Citing the aspirational characteristics of the Middle Class who ‘dress’ their homes in a pastiche of formal ‘styles’ including the recognition of a new one – “the modernistic,”⁶⁸ Langer aligns himself with Boyd and Plischke⁶⁹ without seemingly being capable of defining his position. One alternative reading might be that the “other forces” of Part II could be construed as “non-essential” and by definition, redundant. He concludes: “It cannot be denied that the possession of a home with ‘palatial,’ ‘martial’ or ‘modernistic’ features does often give to the owner a certain feeling of satisfaction. But this satisfaction is for most of us, bought too dearly when it involves the sacrifice of basic needs.”⁷⁰

These human needs, it would seem for Langer, are only met when framed through the lens of reasoned scientific analysis and the “objectivity” of the forms that result from such scientific bases produces a modernity of universal value.

¹ A view expressed by local contemporary Eddie Hayes of Hayes and Scott, see: Alice Hampson, *The Fifties in Queensland. Why Not? Why?* Bachelor of Architecture Thesis, The University of Queensland, 1987 p.109 see also Joanna Besley, ‘The progress of the populist house: modernism in the suburbs’ in Gevork Hartoonian (ed) *Progress Papers of the Twentieth Annual Conference of the Society of Architectural Historians Australia and New Zealand*, Sydney Australia 2003.

² Ian Sinnamon in ‘An Educated Eye: Karl Langer in Australia’ in *Landscape Australia* 1/85 February 1985 p.54 suggests “it was one of the first of its kind in the world.” Much of the key Australian-based publications that foreshadowed the advent of environmental science research followed Langer’s booklet. For example in 1950 the Commonwealth Experimental Building Station published R. O. Phillips’ *Sunshine and Shade in Australia*, and in 1952 published *Notes on the Science of Building* series with SB1: ‘Design for Climate’.

³ Alan Kirkwood, PC April 2003

⁴ Sinnamon, ‘An Educated Eye’, p.49

⁵ Sinnamon, ‘An Educated Eye’, p.54

⁶ Sinnamon, ‘An Educated Eye’, p.56

⁷ Sinnamon, ‘An Educated Eye’, p.49

⁸ Sinnamon, ‘An Educated Eye’, p.49 see also Stanford Anderson, *Peter Behrens and a New Architecture for the Twentieth Century*, Cambridge: MIT Press 2000, p.231: “It is no doubt correct to speak of Behrens as setting the agenda for the architectural works that bear his name in the interwar period. However, his ateliers, at various and overlapping times in Berlin, Frankfurt, the Ruhr, and Vienna, included many able assistants.”

⁹ Alan Windsor, *Peter Behrens: Architect and Designer*, London: Architectural Press 1981 p.159 cited by Sinnamon, ‘An Educated Eye’, p.49

¹⁰ ‘Gundel Prize award certificate’ and ‘notification of winning architectural competition in Turkey,’ Box 36, Dr K Langer Collection, Fryer Library, University of Queensland

¹¹ Dr P.W. Born, ‘Architecture and Decorative Art in Austria’ in *De-*

sign for *To-Day* December 1935 pp. 468-9

¹² Born, 'Architecture and Decorative Art in Austria', p.469

¹³ Anderson, *Peter Behrens*, p.72-75

¹⁴ for an account of Behrens' "advocacy of craftsmanly devotion to the task" such as his preference for the Dutch expressionist 'Amsterdam School' in favour of J.J.P. Oud and the Rotterdam School see Anderson, *Peter Behrens*, p.258 and p.322 note 4. There is an inference International Style architects distanced themselves from Behrens whose later work has been aligned to New Socialism and the rise of Nazism though research is inconclusive, see Anderson, *Peter Behrens*, p.252 and p.321 note 41

¹⁵ There is no available evidence to accurately date this project or its full extent, two hardboard panels of pencil and ink drawings currently in the author's possession (courtesy of Mr Ian Sinnamon) are the known extent. There are no identifying titles or dates other than the same numeric coding: "124816" stamped on each panel. It is assumed as likely to be a competition and/or file entry. The 'fictional' and derivative nature of the scheme would strongly suggest the work is a student project. All annotations on the drawings are written in German. There is no English on either panel, which is unusual in work (drawings, texts, or even hand written notes) by Langer in Australia suggesting it predates the Langers' arrival in Australia in 1938.

¹⁶ Anderson, *Peter Behrens*, p.246-7

¹⁷ Anderson, *Peter Behrens*, p.241

¹⁸ Born, 'Architecture and Decorative Art in Austria,' p.466

¹⁹ The booklet is No.7 in a series of nine that make up Volume 1 of "Papers" published by The University of Queensland, Faculty of Engineering as an occasional series between 1939 and 1947. This series of papers is an eclectic collection of material that relates mainly to research in statics. Langer's paper has no precedent in the pattern of other publications in the series. There is no documented evidence at the time of writing that determines a basis for the publication of *Sub-Tropical Housing*.

²⁰ Karl Langer, *Sub-Tropical Housing*, Brisbane: University of Queensland Papers from the Faculty of Engineering Vol I. No.7, 1944 pp. 2, 6 & 8

²¹ Langer, *Sub-tropical Housing*, p.2

²² Langer, *Sub-tropical Housing*, p.3

²³ Ernest Fooks (or Fuchs), *X-Ray The City: the density diagram: basis for urban planning*, Melbourne: Ruskin Press 1946. Though a few years younger, Fooks like Langer and Plischke was educated and trained in Vienna during the same period. Fooks is an important and influential figure in the history of planning in Australia and had been engaged by the Housing Commission of Victoria (HCV) in as a town planner in 1939 before embarking on private practice in 1948, see Harriet Edquist, *Ernest Fooks: Architect*, Melbourne: School of Architecture and Design RMIT University, 2004 p.13-23 *X-Ray The City* contains a comprehensive bibliography with insightful annotations and the text proper is guided by statistical analysis of spatial implications of population density and crowding (particularly of Melbourne). However the structure of the text does not follow the house/neighbourhood/town model peculiar to Bunning, Plischke and Langer.

²⁴ Walter Bunning, *Homes in the Sun: the Past, Present and Future of Australian Housing*, Sydney: W.J. Nesbit, 1945 p.4

²⁵ in the wartime rhetoric of the 'Introduction' of *Homes in the Sun* Bunning set out a case for the text as a set of "general principles" and cautions "there are no cut-and-dried solutions" p.5.

²⁶ Bunning, *Homes in the Sun*, pp.48-51

²⁷ Bunning, *Homes in the Sun*, pp.89

²⁸ Bunning, *Homes in the Sun*, pp.86

²⁹ the editors, 'about planning', in the architectural group (eds), *planning*, 1/August 1946; p.7

³⁰ Ernst Plischke, 'design and living' in the architectural group, *planning*, pp.8-10 and Ernst Plischke, *Design and Living*, Wellington: Department of Internal Affairs New Zealand, 1947

³¹ see Linda Tyler, *The Architecture of E.A. Plischke in New Zealand, 1939-1962* MA thesis University of Canterbury, 1986 and Linda Tyler, 'The Urban and the Urbane: Ernst Plischke's Kahn House,' in John Wilson (ed), *Zeal and Crusade: The Modern Movement in Wellington*, Christchurch: Te Waihora Press, 1996 pp.33-38.

³² Langer worked for as a draughtsman for Queensland Railways when he took part-time work at the University of Queensland see Sinnamon, 'An Educated Eye' p.54 and in Plischke's case he worked as a draughtsman in the Department of Housing Construction until the publication of *Design and Living* in 1947 see Tyler, *The Architecture of E.A. Plischke* and also Julia Gatley, 'Privacy & Propaganda: the politics of the Dixon Street Flats' in *Interstices 4* interactive CD.

For a more comprehensive account of war-time refugees see also Ann Beaglehole, *A Small Price to Pay: Refugees from Hitler in New Zealand 1936-1946*, Wellington: Allen and Unwin, 1988 and Ann Beaglehole, 'Europe to Wellington: Refugees from Nazi Europe' in Wilson, *Zeal and Crusade: The Modern Movement in Wellington*, pp.28-32

³³ Plischke, *Design and Living*, p.1

³⁴ Plischke, *Design and Living*, p.34-37

³⁵ Robin Boyd, *Australia's Home, Its Origins, Builder and Occupiers*, Melbourne: Melbourne University Press, 1952

³⁶ Linda Tyler describes Sitte as one of Plischke's great mentors see Linda Tyler, 'The Urban and the Urbane: Ernst Plischke's Kahn House,' in Wilson (ed), *Zeal and Crusade: The Modern Movement in Wellington*, p.37

³⁷ Sinnamon, 'An Educated Eye' p.55 and Plischke, *Design and Living* p.60-67

³⁸ Anderson, *Peter Behrens*, p.150

³⁹ Anderson, *Peter Behrens*, p.150 and 154 (footnote 50 p.303) quoting Behrens in 'Seeking Aesthetic worth in Industrial Buildings' *American Architect*, 128 December 1925

⁴⁰ Plischke, *Design and Living*, p.80-81

⁴¹ Plischke, *Design and Living*, p.82-83

⁴² Plischke, *Design and Living*, p.68-69

⁴³ Plischke, *Design and Living*, p.88-89

⁴⁴ Plischke, *Design and Living*, p.56

⁴⁵ Plischke, *Design and Living*, p.82

⁴⁶ Langer, *Sub-tropical Housing*, p.3-4

⁴⁷ Tyler, 'The Urban and the Urbane,' p.37

⁴⁸ Ian Sinnamon recalls being in possession of a copy of *Design and Living*. It's not unreasonable to assume the same of Langer. A Viennese association is probable and highly likely given their similarities in their age and association with Behrens, though to what extent is not the subject of this paper. Fryer Library has no record of *Design and Living* or correspondence with Plischke in the Langer Collection of the Fryer Library. No other archives have yet been consulted at the time of writing.

⁴⁹ For Langer/Bunning correspondence see Box 36, Langer Collection. Langer regularly contributed numerous papers to conferences and so on but not in the polemical nature of *Sub-tropical Housing*. See for example 'Town Planning for the Tropics' in "Symposium on Man and Animals in the Tropics" Faculty of Physics (ed), Brisbane: Australian Academy of Science, May 25 1956. In his conclusion Langer addresses the issues of sun-protection, breezes, orientation and ground cover: Box 39, Dr K Langer Collection. See also 'The planning and Development of Tourist Features' address at the Queensland Tourist Industry Seminar, 25 October 1966 where Langer in a self-effacing mode extols the virtues of the Greek idea of a 'spirit of place' and denounces international architecture for its unsuitability in siting and monotony: Box 39 Dr K Langer Collection.

⁵⁰ Harry Margalit, 'The Common Good: Walter Bunning's Mid-century Ideals' in Richard Blythe and Rory Spence (eds), *Thresholds*, Papers of the Sixteenth Annual Conference of the Society of Architectural Historians Australia and New Zealand, Launceston and Hobart, Australia, 1999, p. 232

⁵¹ see Tyler, *The architecture of E.A. Plischke* for a biographical overview of Ernst Plischke. Robin Skinner in *Interstices 4*, provides a bibliography of texts on or by Plischke

⁵² Bunning makes reference to several built works in Britain and North America including examples of legislation etc that could endure duplicate replication in the Australian context.

⁵³ Plischke, *Design and Living*, p.70

⁵⁴ see note 21

⁵⁵ Langer, *Sub-tropical Housing*, p.2-6

⁵⁶ Langer, *Sub-tropical Housing*, p.3. In his promotion of a slab-on-ground solution to limiting the effects of fatigue Langer intuitively recognises the fallacy in the myth that the Queenslanders was raised on stumps to improve ventilation and reduce heat gain, see *Sub-tropical Housing* p.5. Bunning however continues to partially promote this myth see *Homes in the Sun*, p.58

⁵⁷ David Malouf, 'A First Place: The Mapping of a World' in *Johnno, Short Stories, Essays and Interviews*, St Lucia: University of Queensland Press: 1990 p.261

⁵⁸ Sinnamon, 'An Educated Eye' p.54 see also Langer, *Sub-tropical Housing*, plate 9 and Note 2

⁵⁹ Langer, *Sub-tropical Housing*, p.6-8

⁶⁰ Langer uses the term "(white) people" in the tropics throughout the booklet. This implied racism seems to stem from his reliance on data that relates primarily to Australian statistics, which one assumes was based exclusively on Euro-centric data available in 1944.

- ⁶¹ Langer, *Sub-tropical Housing*, p.6
⁶² Langer, *Sub-tropical Housing*, plates 11 & 12
⁶³ Langer, *Sub-tropical Housing*, p.8-9
⁶⁴ Langer, *Sub-tropical Housing*, plates 1-5
⁶⁵ Langer, *Sub-tropical Housing*, plates 6-7
⁶⁶ Westmead Competition: four hardboard panels of pencil and ink drawings (undated), proposed housing development Madigan St, Hackett, Canberra 1966: six 'dyeline' prints both projects currently in the author's possession (courtesy of Mr Ian Sinnamon).
⁶⁷ Langer, *Sub-tropical Housing*, p.10
⁶⁸ Langer, *Sub-tropical Housing*, p.11
⁶⁹ Plischke, *Design and Living*, p.37
⁷⁰ Langer, *Sub-tropical Housing*, p.11

Paper is open access. The Principles of Sustainable Development of the Architectural Space of Linear Parks. To cite this article: Yu V Gorgorova et al 2020 IOP Conf. The town-planning system and architectural space are formed in a certain environment, and they always include the elements of a natural complex. Environment is a major factor determining the choice of the planning concept. In this sense, the natural environment can be considered to be a complex of different town-planning resources. Their estimation is done both from a point of view of building manufacture, and from a point of view of the organisation of various industrial and nonproduction activities on those territories. The program of functioning of a town-planning system to. The art and science of ordering the use of land and siting of buildings and communication routes so as to secure the maximum practicable degree of economy, convenience, and beauty OR An art of shaping and guiding the physical growth of the town creating buildings and environments to meet the various needs such as social, cultural, economic and recreational etc. and to provide healthy conditions for both rich and poor to live, to work, and to play or relax, thus bringing about the social and economic well-being for the majority of mankind. 3. What do planners do? planning to locate proper place in town for easiness for beauty of architecture propose. 13. modern planning of houses. Recommended. History, Theories, Principles of Urban and Regional Planning. 6. Describe source of the important planning principles followed in the west, by giving suitable examples. [20] 7. (a) What is zoning and how does it help in orderly growth and development of cities? (b) Explain the term neighbourhood and write some important principles of neighbourhood planning. [20] 8. Write short notes on any three: (a) Regional planning (b) Satellite towns (c) Mosques in India sarasenic period (d) South Indian temple designs. Write the main principles for planning a residential neighborhood. b) Briefly explain the housing situation in urban slums and approach to improvement. [10+10] 8. Write short notes on any three. a) Planning legislations. b) Garden cities. c) Dravidian style of architecture. d) Egyptian pyramids. [20] *. Learn about and revise the key characteristics of rainforests and the effects of human intervention with BBC Bitesize GCSE Geography. Tropical rainforest biomes are found in equatorial countries in hot and humid climates. Human intervention has positive and negative consequences for people and this environment. Part of. Geography. Ecosystems. Add to My Bitesize. Add to My Bitesize. Twitter.