

In tropical architecture, the materiality of western modernism is altered in relation to tropical site. While some aspects of tropical architecture reproduce western norms, other practices acknowledge the tropics as the site of difference. This negotiation with difference is marked by the dominance of western discourse, which constructs a binary logic in which the tropical contrasts with the west. Where this can be of benefit to the west, such contrasts are harnessed to augment the cultural richness of the dominant discourse. Elsewhere, they are erased.

## **5. COMFORTABLE BODIES**

### **5.1 Outline**

The body is a central subject in the knowledge and practices of modern architecture in West Africa. This chapter will look at how bodies are defined, ordered, engaged and excluded in the discourse of climatic responsiveness. The intention is to understand the nature of the body imagined in climatic discourse and the theories on which it draws. How is the identity of the body constructed and maintained in the discourse? How did these imagined concepts of the body in texts, scientific explanations and practices relate to real bodies and their practices?

A fundamental aim of climatic responsiveness is to achieve comfort for the body. The chapter begins by defining the modernist concept of comfort and exploring its use in texts on tropical architecture. This concept of comfort drew on scientific knowledge, but applied it in contexts that are politically and geographically charged.

The second part of the chapter deals with the physical relationship between bodies and the buildings of tropical architecture. This examines how the bodies of users engage with the forms and systems of the building in order to deal with climate. It will show how architecture extends and reproduces the broader discourses of colonialism and modernity on a micro scale.

The third part will discuss the relationship between climate responsive practices and bodies that are deemed to be 'outside' the limits of modernism. Using two case studies, it introduces the idea of other forms of use coexisting with, or displacing the assigned uses of the buildings. It will look at the absence or invisibility of certain practices in climatic design, as well as the mode of assimilation of "Arab" culture into tropical architecture. The chapter aims to build up a picture of the relationship between architecture and the body in the theory and practices of climatic design as a discourse that is simultaneously affected by the projects

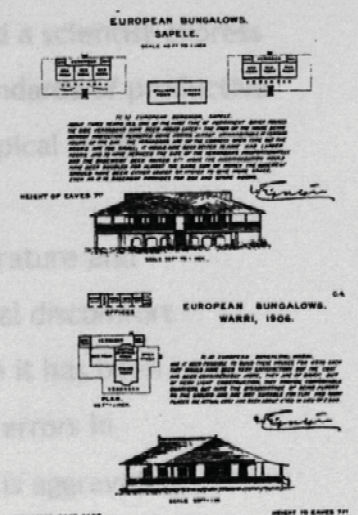


of modernity and colonialism. The bodies in these projects are divided and defined, as African or European subjects, officials or workers, civilised or developing. Are these bodies ever neutral, stable, or singular? If not, what does this mean for a concept of climatic responsiveness that is centred on an idealised, comfortable body?

## 5.2 Comfort

The intention of climatic responsive design is to create buildings that are comfortable to inhabit. There are many ways to do this, and most rely on some sort of active engagement with a building on the part of users. The modernist approach in West Africa, which absorbed theoretical and design concepts from the precedents of colonial building, attempted to create a systematic interrelationship between buildings and the bodies that inhabited them. These intend above all to make these bodies function better in the hot, humid weather of the tropics. The texts of tropical architecture echo those of colonialism, which stated an explicit concern for the well being of expatriate employees, who came from colder climates and were seen to perform less efficiently in the tropics (CSIR 1957, Fry 1972, King 1976).

The modern practice of climatic design has precedents in popular and self-conscious approaches. Colonial buildings were often raised off the ground and surrounded by verandahs to allow cross-ventilation (Fig 5.1). King (1976: 102-) traces an early example of specific design solutions being devised in response to the British concern with the productivity of western subjects stationed in tropical climates through the example of military encampments in India in the late 1800's. In order to curb excessive mortality rates amongst British troops various techniques were devised to improve



5.1 Colonial Housing in West Africa, 1906. Source: Colonial Office, West Africa, *The Design of Bungalows for Government Officials in West Africa*, 1909 (King 1984: 211)



air circulation and reduce heat and sun on the heads of soldiers. These included standards which lowered the density of residential quarters and included open space between buildings. Dormitory buildings were devised with clerestory vents and double roofs for ventilation and even a prototypical airconditioning system that sucked air through underground wells was used to cool internal air was developed.

Tropical architecture shares this interest in expatriate health and comfort, but in addition, as the colonial period came to a close, the concerns for comfort began to extend to the bodies of local subjects. The belief that Africa had to overcome climatic disadvantages in order to develop were held by British and local elites alike (Nkrumah 1961). Blaut (1993: 69) has described how Europe harboured widespread and longstanding anxieties about the effect of tropical climates on its inhabitants. Many writers and scientists supposed that the effect of a hot, humid climate on the human body, along with disease and agricultural problems, had resulted in the relative backwardness of Africa and its inhabitants. Notwithstanding the fact that scholarly literature rejects these climatic theories, they remained popular up until the 1950's.

British architects in the 1950's appear to have bought into this doctrine. In an address to the Architectural Association, G. Anthony Atkinson informed his colleagues that "apparent backwardness of culture is associated with climate in the common picture of tropical life" (1953: 8) At the Conference on Tropical Architecture, architects heard a scientist express concern about the negative effect on tropical climates on modern standards of productive work. As Professor Crowden, a speaker from the London School of Tropical Medicine put it:

" It is well known that in hot and heavy industries, high temperature and high humidities cause a reduction in working efficiency, thermal discomfort and an instinctive desire to rest frequently. In mental work too it has been shown experimentally that hot conditions cause an increase in errors in performance. It has also been shown that restlessness in sleep is aggravated by high air temperatures and high humidities and it follows that day-to-day efficiency will inevitably decline if the physiological need for restful sleep is not satisfied." (Foyle 1954: 28).



Crowden felt that architects could address these problems by understanding and aiding the body's need to be comfortable. But what did modern architects understand by this? The concept of comfort that was current during the period of tropical architecture relied on an empirical definition of bodily sensations. For le Corbusier, comfort indoors was achieved at a temperature of eighteen degrees centigrade (Banham 1969). The scientific definition was more complex, suggesting that sensations of warmth or cold relate to an "effective temperate" that depends on actual temperature, humidity and air movement. The specific range of these variables at equatorial sites was determined in 1960 by a British researcher, C.G. Webb, who defined this "comfort zone" as that effective temperature range at which experimental subjects reported feeling neither too warm or cool.

A significant direction of research around building for tropical regions involved the development of the concept of comfort and the mechanisms to achieve it. Theoretical investigations were pursued that became increasingly precise in defining the limits of the "comfort zone" for different subjects (CSIR 1957). Practical techniques, many with precedents in indigenous or colonial built forms, were tried out in buildings and published in the literature of Tropical Architecture.

A number of researchers took on the task of translating scientific concepts into methods that professionals could use to measure climatic factors and make buildings more comfortable. Professor Crowden provided a list of measurements to be taken to determine effective temperatures and discussed the importance of general techniques of insulation and ventilation (Foyle 1954). Specialist courses such as the one at the Architectural Association (AA 1954) and related textbooks (Koenigsberger 1974, Oakley 1961, Fry and Drew 1956) imparted key techniques. Victor Olgyay's chart, published in Princeton in 1963, which related the effective temperature to conditions of low wind speeds became a popular tool to determine the design of comfortable interiors in tropical zones.

Most of these approaches take a deterministic view of the relationship between bodies and their environment. They rely largely on experiments (CSIR 1957: C5, D13; Atkinson 1950: 317) that isolated subjects in "hotrooms" to measure their responses to effective

temperatures, or techniques (Fry and Drew 1956) that isolate building elements to measure their thermal performance as reflectors or insulators of heat. The data produced in these approaches ignored the dynamic relationships between users and their physical surroundings.

Many of the texts on thermal comfort stress the need to correct these experiments to include different subjects to the North American and British workers who formed the early test groups. For instance, Angus (Foyle 1954: 37) suggests that a scale for India should be made using Indians in traditional dress, and Biesheuval (CSIR 1957: D18) proposed comparative experiments amongst subjects from different racial groups who were acclimatised to Johannesburg to find a racial factor in comfort responses.

While comfort involved keeping the body cool, there were other needs which some scientists felt architects should address. At a conference on tropical design held in Durban in 1957, Dr Biesheuval outlined the popular belief that expatriates were prone to “tropical neurasthenia, tropical fatigue or hot climate fatigue” and then expressed his own more guarded opinion that psychological factors played as important a role as the physiological ones such as excessive heat and humidity.

The mechanistic view of the body that prevails in the literature of tropical architecture is in contrast to the psychological definition of comfort which would tie it to social or cultural identities. The differences inherent in such definitions posed problems for a discourse that aspired to universality. Biesheuval’s comments, which concern expatriate subjects, suggest that the psychological health of Africans lies outside the boundaries of the discourse. Indeed, in the literature, in contrast to the intensity of scrutiny in experiments and summaries of white health, the diversity of local bodies, each with their own particular customs and dress, is only addressed in a broad methodological fashion (Foyle 1954). The institutional recognition of social difference, as exemplified in course components such as “social problems of building in the tropics” (AA 1954), is a broad overview. Similarly, Fry and Drew suggest a survey of “people and their needs” (1956: 23) should be considered in design.

Architects tended to deal with social or racial difference by designing for a “developing” local body. This subject was someone who, while holding on to aspects of their traditional culture, could be led to see the benefits of modernisation. Fry and Drew illustrate this through anecdotal examples of resettled villagers in West Africa and future residents of Chandigarh who were prepared to negotiate away traditional ways of living in order to deal with the impact of modernism (1956: 24).

There is an interesting spatial turn in the metaphors used to describe tropical people in such texts: they are “in a state of change and movement” (Fry and Drew 1956: 24), “drifting” (Stockdale 1948: 143), freed from “local ties and disciplines” (Lock 1969: 186). This mobile body in some way conflates with that of the expatriate, whose stay in the colonies is temporary. Such bodies require a new type of dwelling in which customary practices and goods are replaced with functionalist and ephemeral forms.

### 5.3 How climatic responsiveness involves bodies

Many buildings in West Africa were designed towards views. They are often elevated, and orientated towards sea or dramatic landscapes. Large expanses of glass are used on the elevations facing towards the view, allowing the picturesqueness of the surroundings to be appreciated from within.

By supporting the gaze of expatriates onto their surrounding architecture extends the projects of colonial literature and art to render their surroundings into a cultural product for the delight of the colonialist (Said 1993). The outwards gaze of the colonial or westernised user further controls what it surveys. The reverse view into the building is blocked in the name of privacy. Thus the building conceals the colonial user from unwanted scrutiny from the outside, a concern that does not seem to apply in the other direction.

The strategic relationship between a watching colonialist and an observed landscape is one that serves colonial interests. The viewer

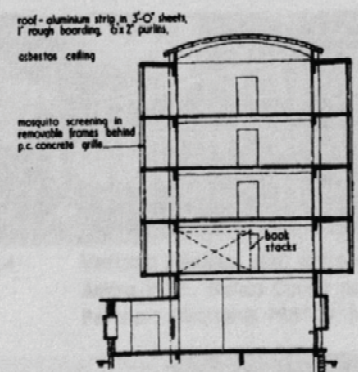


who takes pleasure while he helps to control is part of a larger mechanism that facilitates power's spatial functioning through the gaze. Like the eighteenth century panopticon structure devised to control prisoners from a dark centre by putting them in light (Foucault 1977), the building operates as an instrument to maintain the relationships between dominant and subordinate subjects. Its use perpetuates certain representations of the place in which it is sited and maintains stereotypical identities on either side of the dividing line of its interior and exterior territories.

The window wall, while expanding the view to become the backdrop for daily life, presents a problem for climatic control. Expanses of glass let in sun and trap radiation, creating greenhouse type heating. Architects had to find solutions to these conflicts. In these, the design of the building wall towards the view took on a number of forms, many of which, as the previous chapter documents, had a strong aesthetic quality.

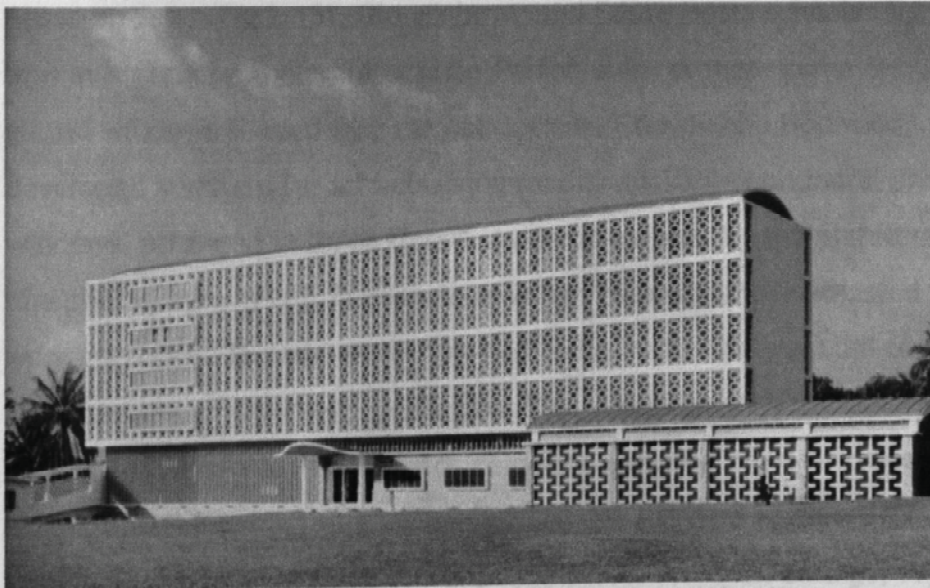
In some of the simplest solutions the design is a contained system requiring little human intervention. These solutions use perforated walls of breeze blocks or precast concrete. The body of the user remained passive, simply being affected by the views and cooling breezes that the design allows. Fry and Drew used breeze blocks for their earliest school buildings in Ghana, including the hall at Opuku Ware (Fig 4.38). As the architects for the Ibadan University library they replaced the northern wall with a striking screen of blocks, allowing air to circulate within the space (Fig 5.2, 5.3). In the Ibadan library the areas most likely to be used for work are raised to first floor height and above. At this level the flow of breezes is less obstructed.

In other approaches, architects came up with mechanical solutions to



5.2 Fry, Drew and Partners. Section, Ibadan University Library, Nigeria 1951 (AD 1955:161)



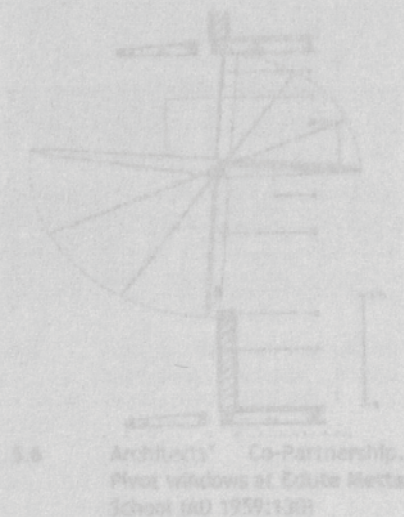


5.3 Fry, Drew and Partners Ibadan University Library 1951 (AD 1955: 161)

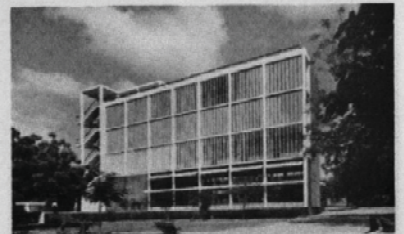
the conflict between the desire for views and the heat ingress that comes with permanently open windows, in which adjustments to these openings become the resolving element. In these buildings the user operates movable screens and louvres, alternately closing out the sun and view, or opening it up to the view (and possibly the wind). In doing so, the user becomes an element in the buildings' proper functioning.

Drawing from the example of Niemeyer's Brazilian work, James Cubitt and partners (Fig 5.4), Kenneth Scott (Fig 4.26) and Godwin and Hopwood (Fig 5.5) had used adjustable vertical slats to shield the facades of office buildings from sun. These panels often moved in sets, controlled by a handle. Vertical slats on the south and north required adjustment on a daily cycle to work effectively. The slats needed to be set at right angles to the sun as it moved from east to west. The task required an organised effort, and in some cases became part of the job description of workers (Adebayo 1991).

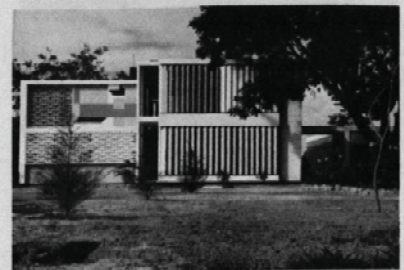
Many designs for school buildings used horizontally pivoted windows, either solid panels which entirely opened, like those used at the



5.6 Architecture Co-Partnership First windows at Edele N. School 1959:130



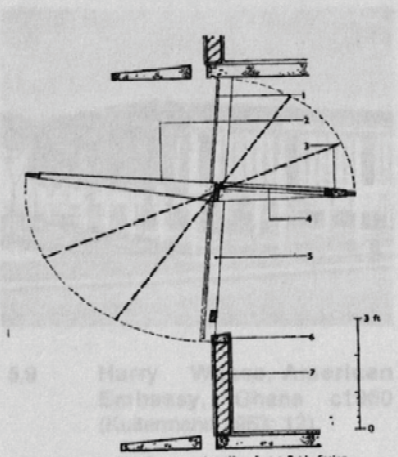
5.4 Vertical louvres. IDC offices, Accra 1957. James Cubitt and Partners (Richards 1961: 116)



5.5 Vertical louvres. Godwin and Hopwood, House, Kano 1958 (Kultermann 1963: 129)



Ansar-ur-deen (Fig 2.15), Olowogbowo and Edute Metta schools (Fig 5.6) in Nigeria by the architects Co-Partnership, or more commonly, glazed windows shaded by external devices. Godwin and Hopwood developed a system for schools using readily available horizontal pivot windows, arranged in three tiers<sup>14</sup>. As demonstrated by the architects in a photograph, (Fig 5.7) the windows had to be carefully adjusted to work correctly. The upper window had to be horizontally placed to allow the maximum cross ventilation. The middle pane, with its glazing replaced with an asbestos cement panel was tilted to create shade, and the lowest window was pivoted at an angle to divert the breeze to the level of the childrens' bodies. At Prempeh College, Fry and Drew use a combination of adjustable glass louvres and an external movable timber brise soleil as a sensitive climatic filter with a dramatic appearance (Fig 5.8).



5.6 Architects' Co-Partnership. Pivot windows at Edute Metta School (AD 1959:130)



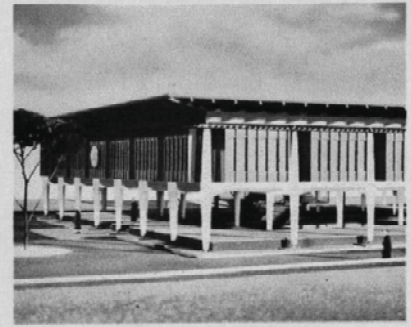
5.7 Godwin and Hopwood Christ Church School, Lagos 1953 (photo Godwin and Hopwood)



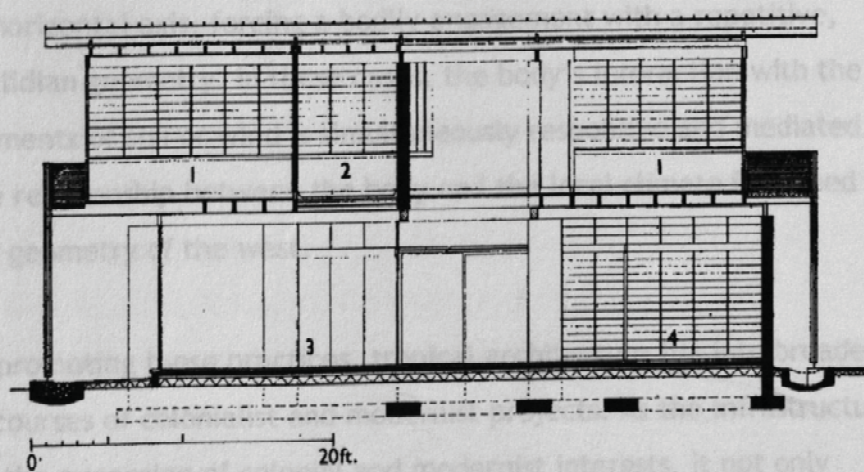
5.8 Fry, Drew and Partners Sunscreens at Prempeh College, Kumasi, Ghana 1955 (photo Hannah le Roux)



Although horizontal shading could be adjusted to cut glare early and late in the day, it was not always necessary to do this. Many of Fry and Drew's school buildings, for instance, used fixed shades above banks of louvred, glazed or timber slatted windows. Small horizontal timber louvre panels were also used in the American Embassy in Ghana by Harry Weese (Fig 5.9) and in the house at Enugu by the Architects Co-Partnership (Fig 5.10).

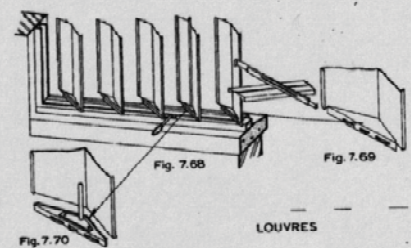


5.9 Harry Weese, **American Embassy, Ghana** c1960 (Kultermann 1963: 12)

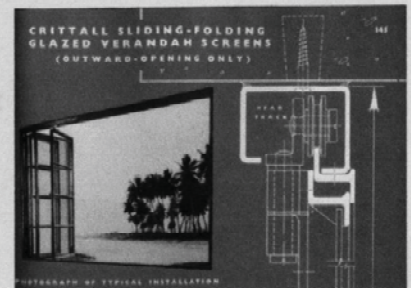


5.10 Architects Co-Partnership, **House, Enugu, Nigeria** (AD 1959: 134c)

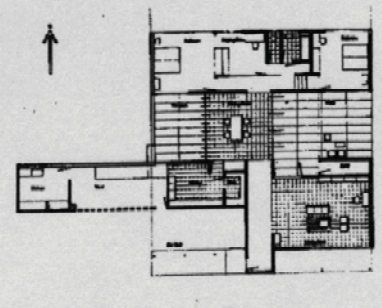
Small louvres were amongst the solutions that were most easily adjusted by individual users in a casual way (Fig 5.11). Small pivoting, sliding or french doors were similarly manoeuvrable (Fig 5.12). These solutions were often applied to domestic residences where the work involved in opening and closing the house could be tied to domestic routines or assigned to a domestic servant. Many of the houses designed by James Cubitt, including the staff housing at Kumasi (AR 1956) and the Volta River scheme (Fig 5.13), use adjustable window or door panels.



5.11 Louvres (Fullerton)



5.12 Crittall sliding-folding glazed verandah screen from catalogue section on export range (Crittall 1953: 145)



5.13 James Cubitt, **House at Volta River** (AD 1954:3)



different architects' use of common engineering and manufacturing consultants facilitated the spread of solutions. Yet to work correctly, even with ideal solutions in place, most of these relied on an outside agency of the user.

This agency was tightly choreographed. To imagine these devices in use involves seeing them properly opened, closed, adjusted and secured by numerous hands. The collective gestures made to achieve comfort in these schemes are a sort of mechanical ballet. Most of the windows and doors are set in sequences and pivot or turn on a vertical or horizontal axis, forcing a bodily engagement with a repetitive, Euclidian geometry. In these cases, the body's interaction with the elements of sun or wind is simultaneously responsive and mediated. The relationship between the body and the local climate is framed by the geometry of the west.

By promoting these practices, tropical architecture fits into broader discourses of colonialist and modernist projects. As the infrastructure for the expansion of colonial and modernist interests, it not only serves but also reproduces appropriate embodied behaviours. Climatic devices in this architecture becomes examples of what Foucault (1975) has called a technique or more accurately, a *techne* (Rabinow 1984: 255) in the deployment of power. Buildings are designed to engage the body of the user in a dialogue with the surroundings in a way that suggests behaviours and uses. Whether this is an active involvement in operating elements or a passive one of enjoying a certain sense of comfort within the building, the building functions as an instrument that promotes certain postures and movements.

#### 5.4 Climate and identity

#### 5.4.1 Differentiated bodies

While climatic texts tend to focus on biological bodies which respond to climatic stimuli within standard ranges and inhabit and alter their environments in predictable ways, the colonial situation of tropical architecture forces the acknowledgement of social difference in the good functioning of space. Nonetheless, these definitions of difference are in many ways essentialist, forcing bodies to conform to an externally defined and limited range of identities.

In the overall scheme of climatic design, there are some key distinctions between different classes of bodies. As grouped in a timetable detailing the “living patterns” in South East Asia (Fry and Drew 1956: 44-45), there are office workers of western or westernised background, and office workers of local ethnicity, and manual workers. In West Africa, similar distinctions were made between westernised elites and local workers.

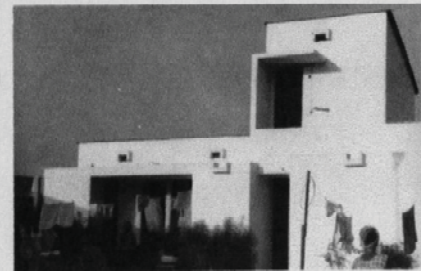
The common planning practice in the 1950's was to segregate members of these groups (Home 1997). Terms such as “senior”, “junior” and “service” staff were used to define groups along occupational bands that correlated with their ethnic backgrounds. These groups were then assigned different spaces in the city, set apart by zones of cleared or landscaped land. In the plan of Kumasi University, each group occupied a discreet housing zone, with the exception of domestic workers who are given a room within the houses of the elite (AR 1956).

The recognition of local ethnicities in the design of individual buildings was sporadic. Most offices, schools and other public buildings were designed around western norms of space and institutional hierarchy. In the design of housing for workers, however,



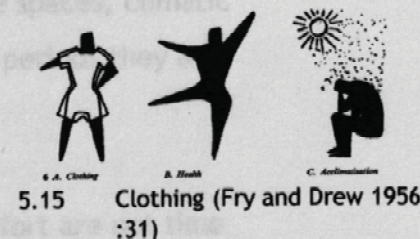
some architects attempted to provide for a limited number of non-western practices.

Some of these concessions to difference were economically determined. For instance, workers' housing in Ghana although seldom large enough to contain a family with children typically included an outside cooking yard or verandah (Fig 5.14). In Nigeria, architects differentiated between the customs of Muslim workers from the north and southerners. The government funded workers' housing planned for Kaduna which is disposed around courtyards was given both a climatic and cultural rationale (Lock 1967).



5.14 Architects' Co-Partnership, workers' housing, Tema, Ghana 1954- (AD 1959: 139)

In the texts, some reference is made to the impact that the clothing might have on the experience of climatic conditions. Fry and Drew (Fig 5.15) represent this factor by a figure in a short suit, such as an expatriate functionary would have worn. Atkinson (1950: 314) evokes the images of two forms of dress to explain different physiological responses to climate, contrasting "the Arab's white robes" and "the Negro [who] needs little clothing for comfort". He points out that the "comfort zone for a naked, inactive man" is the normal temperature in the humid tropics, suggesting that a hard working man would need to sweat profusely to keep cool. In this case, "clothing only impedes the flow of air over the skin".



5.15 Clothing (Fry and Drew 1956: 31)

These texts evoke three different styles of dress for three different categories of workers along cultural lines. Interestingly, references to female dress styles are entirely absent. Categories such as these fit into stereotypical views of difference between cultures. In these examples western codes are assumed to be the norm or exemplar, while Arabic culture is exotically different. Atkinson's orientalist evocation of the sensual image of "long flowing robes" that create breezes and evaporative surfaces around the body contrasts with the



mechanistic western solution to comfort. The image of the “negro” body as a naked, labouring, sweating one is similarly essentialist. This inaccurate description of vernacular West African clothing practices strips the body of its cultural layers, reducing it to a unit of labour.

#### 5.4.2 Temporal practices

The body’s experience of space ordinarily includes different sensual qualities which might alter over time. The variety of these experiences, as Heshong (1979) has observed, make for an enriching environment. Within the spaces of tropical architecture, practices of climatic responsiveness often smoothed out such differences, making for a space that was formally and experientially homogeneous throughout the day. In these spaces, climatic control serves to keep spaces similarly cool and ventilated during the periods they are occupied to negate the effect of daily and annual fluctuations.

It is significant that the experiments indicating western norms of comfort are not time specific. This parallels the nature of modern western work which is repetitive within the day and year. Tasks could be performed and repeated any time, in an environment that could be located anywhere within the world. In this way, the application of comfort norms facilitates the disembedding of space and time that Giddens (1990) has noted as a feature of modernity, and which severs traditional relationships between local temporal practices and spatial qualities.

Although climate is by definition a local feature, tropical architecture aims to negate its impact on the body. This is in contrast to practices which work with climate in a dialogic way. In the latter approach, local climates and local practices are interrelated. These might involve customary rituals of use, such as daily bursts of early morning activity and periods of midday rest, and annual rites of renewal (Prussin 1995) all of which are acts involving some agency on the part of users in relation to their built environment. In these, the user’s response to inclement and seasonal conditions is enveloped in a set of bodily practices that may be amplified by custom or myth, and that are tied to their particular



context.

## **5.5 Conclusion**

Narratives of the body thread through the theory and practices of climatic responsiveness. These are structured around imaginary bodies, that are classified or in some way imagined architects, as well as around the real bodies that use these buildings. This chapter, looking at the ways that the discourse of climatic responsiveness defined, ordered, engaged and excluded them, built up a picture of the nature of these bodies.

By narrating the way that comfort was defined and achieved, it showed how climatic responsiveness treated the body as a functional entity, defined in mechanistic terms. Climatic design in tropical architecture was intended to achieve conditions of comfort that would allow bodies to function in the tropics as they did in the West. Architects believed that comfort could be defined scientifically, and attained by the correct use of mechanical devices to neutralise the effects of uncomfortable climates.

The empirical measures taken to measure comfort rely on a limited definition of the body that either negates or stereotypes social difference. Local bodies are seen as “developing”, and their position, like that of the expatriate, is described as mobile. These bodies are involved in buildings in a deliberate way by the design of elements like windows, that present the landscape for viewing, or adjustable devices that involve the body in the control of its own environment.

The classification of bodies within texts and the practices of building alike shows how architects subscribed to the sorts of stereotypes that were typical of colonial thinking. Western codes are assumed to be norms against which other bodies are seen. These are held to belong either to exotically different cultures, or to be acultural, physical units of labour.

By virtue of its temporal sameness, the spaces of modern climatic architecture permit the

body to perform repetitive tasks at any time throughout the day or year. In this sense, it frames embodied practices that contrasts with traditional ones, which engage with the changes that take place in local climates. In this sense, climatic discourse is dismebedded from local spaces and times.

These narratives present an image of the body in climatic responsiveness that, while drawing its definition from science, can no longer be seen as neutral. Rather, it has a constructed nature, that makes it fit to function in a particular modern and colonial system. It replaces other sorts of bodies that are embedded in a particular place, either by dismissing their cultural dimensions, or by engaging them in specific ways of dwelling through the specific configuration of the building's form.



## **6. REVISITING TROPICAL ARCHITECTURE**

### **6.1 Outline**

As part of the research for this study, I visited Ghana in January 2001. This visit included a stay at the National University of Science and Technology, which was planned by James Cubitt and built from 1951 onwards. Here, I observed a setting for significant works of tropical architecture, but moreover obtained a perspective of their meaning after a fifty year period of use.

In this chapter, the experience of this visit will be used as evidence of the ways in which the uses of the campus by Ghanain people over the last fifty years forms a critique of tropical architecture. The chapter describes three processes of use in relation to the spaces of tropical architecture. In the first of these, these spaces are maintained. The second process is one of transformation, whereby buildings have become the material for a different way of using and making space. In the last process identified, users have reversed the given uses, exploiting the empty spaces created by modern planning in order to embed other spatial practices within the site.

### **6.2 Kumasi campus**

In the 1950's, James Cubitt designed the campus for a new University of Science and Technology for the Gold Coast. Commencing with a campus plan (described in Chapter 4), the architects then designed certain key buildings including a cluster of technology workshops, a lecture block and staff housing.

On the 29<sup>th</sup> of January, 2001, my hosts in Ghana, architects associated with the University, kindly arranged for me to visit a number of these buildings. From the university architects' offices, where an original model of the campus is kept, we continued to the so-called B-Type houses, stopping to visit the home of Professor and Mrs



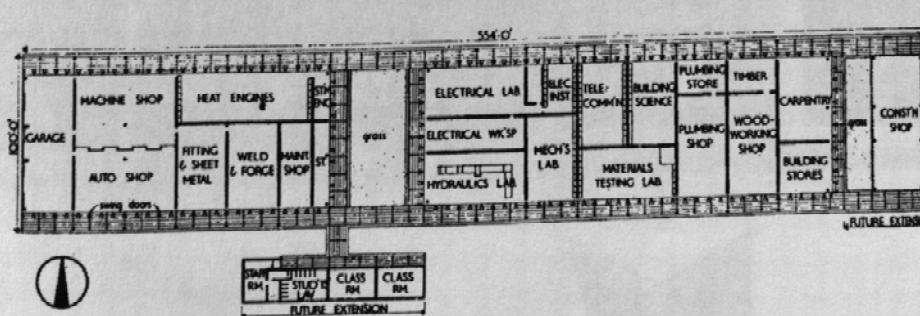
Drew Hammond in Okodee Road. We went on to visit the engineering workshops before returning to the guest house.

### 6.3 The engineering workshop

The engineering workshop at Kumasi was a model of a mechanical control with both the building and its contents designed to be highly functional (AR 1956). The building envelope was conceptualised as a mechanical filter that could be adjusted in relation to changing uses inside, as well as in relation to climatic conditions.

The building is the setting in which students learned to use machines that would be found in industry. The overall layout consists of two hall like workshop spaces, laid out in a line (fig 6.1).

The largest space contain work tops for experiments and small machine assembly. One section of the building houses machines such as lathes and compressors that are used to make and alter other machines. Most of these were imported from the United Kingdom in the 1950's.



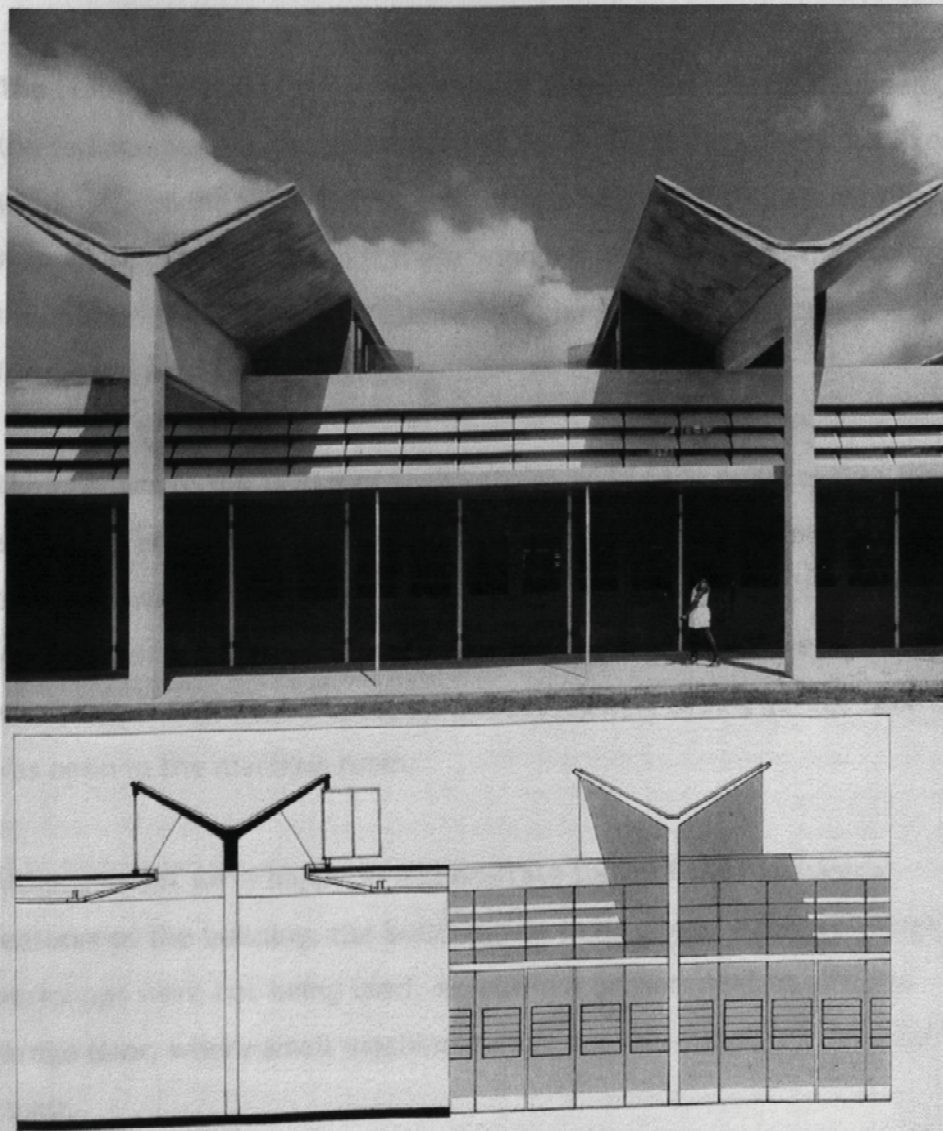
6.1 James Cubitt, plan of Engineering Block KNUST 1951 (AJ 1956a: 198)

Since the machines in the building generate heat when they are being used, they need to be ventilated. At the same time, the architects imagined that these technologies would be outdated and would need to



be replaced and arranged in different configurations in time. To achieve this, the architects designed open plan spaces which do not interfere with the dynamic arrangement of equipment.

The solution to the problem of large, open plan spaces that required good ventilation was to provide this through the profile of large space roof elements, which consist of parallel reinforced concrete Y-beams raised above a lower flat roof to provide a sequence of clerestoreys (AD 1954: 4). When built, these held tinted, power-operated windows which pivoted open within a range of up to  $135^\circ$ , allowing them to be



6.2 James Cubitt, Engineering Block KNUST 1951 (Kultermann 1963: 103)



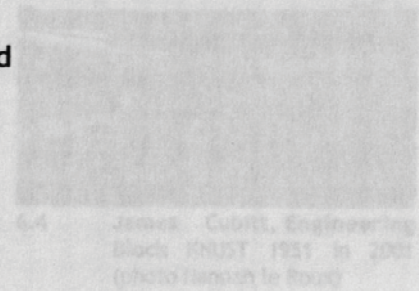
adjusted, bay by bay, in relation to the sun and breezes (Fig 6.2). Below, demountable partition walls made from concrete blocks allowed the space to be subdivided into spaces for different tasks.

The perpendicular walls on either side of the workshop are divided horizontally into an upper section of solid, horizontally adjustable louvres and a lower one made up of sliding, folding doors, each with an inset of adjustable steel louvres. These can be collectively slid away or left in place with the louvre panels open, controlling cross ventilation in response to breezes and rain. Service are run on a cat walk that allows the windows to be cleaned.

The building remains largely unaltered. The biggest change has been the replacement of the pivoting windows in the clerestoreys with fixed windows, making the building, according to a long term staff member, warmer than before. Even if these windows had remained, the power requirements would have presented problems since grid supply is frequently affected by outages.

The changes to the layout of technologies within the building that the architects envisaged seem not to have been made, as the internal partitions were still in place (Fig 6.3). Perhaps because the building was not being used by students during the visit, the multiple door and window openings were almost all closed. A single sliding garage door was open in the machine room.

Although staff were happy to demonstrate some of the mechanical features of the building, the building was in its closed state. The large workshops were not being used, except in a corner, next to an open garage door, where small machine parts were laid out on the floor for repair.



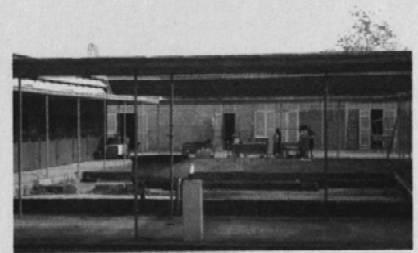
6.4 James Cubitt, Engineering Block KNUST 1951 in 2001 (photo Hannah le Roux)



6.3 James Cubitt, interior of Engineering Block KNUST 1951 in 2001 (photo Hannah le Roux)



In the original design a small ablution and classroom block was placed parallel to the workshop blocks. This building had been expanded using timber construction and in part works as a store room. This seems to be a busy facility. A small stall selling snacks has been set up on the underused walkway that runs outside the workshop facing this block, obviously benefiting from the passing trade of visitors to the store (Fig 6.4).



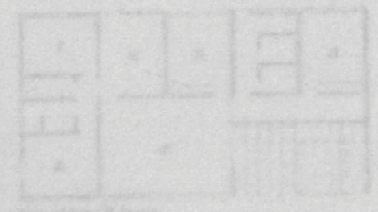
6.4 James Cubitt, Engineering Block KNUST 1951 in 2001 (photo Hannah le Roux)

In contrast to the fairly dynamic activities around the storeroom and this stall, which is obviously emptied of its goods each night, the uses of the workshop appear to be repetitive. The efficient adjustments and dynamic changes to the structure that the architects had entertained did not seem to have been brought into effect. Instead, the activities of use preserve it. In the context of contemporary technology the buildings' uses seem to have an anachronistic quality.

#### 6.4.4 Richmond house

The ongoing maintenance of the engineering workshop appears to be sanctioned by the university. Although it has not been updated, it seems that it cannot be allowed to decay either. In this case, the process of maintenance involves a sort of rote use of the building, oiling and dusting the moving parts that no longer serve any dynamic role.

The uses of the building today are in contrast with the sort of life cycle that was planned for the building by its architects, in that they have maintained, rather than constantly renewed its contents. The static position of the movable elements renders the climatic design of the building's skin redundant. The maintenance of the building, rather than supporting the architects' understanding of modernity as a dynamic process, keeps it fixed in the condition that it was in nearly fifty years ago.



6.3 James Cubitt, Plan of Type 'B' house plan KNUST archives 1941: 112



6.4 James Cubitt, Type 'B' house plan KNUST archives - 1941: 114



The use (and absence of change) of the building suggests its iconic nature has some significance. Perhaps the building's status as a symbol of a shared and elite vision of western and West African modernity when it was built has conferred on it a special respect today.

Moreover, the condition and use of the building points to the failure of the vision of modernity present at the time of the building's construction. West African technology has not been updated at the same pace as other places. At present, even fundamental services such as power and water supply are intermittent on the university campus. Under these conditions, the maintenance of the building seems to be a pragmatic response that aims to preserve an asset that cannot be renewed in the ways that were predicted when it was built.

#### 6.4 Hammond house

The study is of a house that was designed in the mid 1950's for junior academic staff. A number of these so-called 'B' type houses (Fig 6.5, 6.6), all identical, were laid out in a series out about fifty metres apart along a road (AR 1956). When built, the houses had flat roofs with an "impluvium" opening over the entrance and patio area, but this has been covered by a pitched roof to prevent leaks. The main space is a living room designed with a large window wall made up of horizontally pivoting windows, allowing it to be opened for the breeze and the view.

In the 1950's, most of the academic staff were male British expatriates. It was common practice for them to employ a house servant to cook and maintain the house, and the design included a "boy's room" off the kitchen. This is separated from the rest of the accommodation by an open courtyard, open to the side or rear of the

key  
1 kitchen  
2 yard  
3 bedroom  
4 living room  
5 boy's room



plan of type B house.

5 0 35

6.5 James Cubitt, Plan of Type 'B' house plan KNUST (Richards 1961: 113)



6.6 James Cubitt, Type 'B' house KNUST (Kultermann 1963: 124)



building and facing away from the entrance. When it was built the separation would have kept the servant, along with the kitchen heat and smells apart from the master in the living room. The servant would have moved between inside and outside cooking and storage spaces, while the master remained under shade.

The house that was visited in 2001 is occupied by the Hammonds, a Ghanain women lecturer and her husband. Mrs Hammond is the mother of two school age children<sup>15</sup>. She does not employ a servant, and does all the cooking for the family herself. She sees the house's plan as problematic in a number of ways. The separation between the kitchen and the main house presents a dilemma if she wants to cook and supervise her children at the same time. They must either share the dark, hot space of the kitchen, or work outside or in the living room.

She thinks the house is too small. Unlike an expatriate lecturer who would have returned "home" after a contract, she plans to stay, and the absence of storage presents a problem. The possessions of the family, books, toys, souvenirs and so on, do not fit into two small bedroom cupboards, and these take up a lot of the open spaces in the design. In effect, the family has turned a section of the passage into a store area, blocking the breezeblock wall with a solid pile of objects.

The traces of her actions or decisions show how Mrs Hammond has reacted against other aspects of the design. By painting a floral mural on the blank wall that faces the road she has distinguished her dwelling from the other "Type B" houses (fig 6.7). This gesture of decoration, as a ritual construction of domestic identity with parallels in Ghanain architecture, and set it apart as her home. Moreover, the design animates and wraps the house's blank wall, that, as an east



6.7 James Cubitt, Type 'B' house in 2001 (photo Hannah le Roux)

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<sup>15</sup>  
Interview with Mrs Hammond, 29 January 2001



facing one, was designed as a solid one. The use of tropical iconography is interesting, especially in the light of her choice to obscure the view of her surroundings by using curtains. Symbolically, the images of plants camouflage the house in the landscape. Rather than look at it, it becomes part of it.

In contrast to the image of it in journals the interior of the house is dark. Mrs Hammond has covered the wall of windows with curtains, with only the screen door looking on to the main entrance open. Other concerns, possibly privacy, or the control of the sun, or keeping insects out seem to have taken precedence over the view and air flow for which the windows were designed.

In this house, Mrs Hammond has used her agency to redefine the house's physical form and its meaning as an artefact. Her strategies include reoccupation, where she has taken over the kitchen, and resurfacing, where she has changed the appearance of the windows and the walls. These actions create a reversal of some of the uses of the house assumed or imagined by the architect. But in other ways, her use of the house fits in with the original vision. The house is a valuable amenity. Formal housing is in short supply in Ghana. The campus plan allowed for her, as a lecturer, to have a house near her place of work.

The university's tolerance of different uses of official housing, such as Mrs Hammond's, show that it has developed a concept of built order within which such gestures can be accommodated. In this thinking, the forms of modernism become appropriated at the same time as some of their conceptual content is negated. Like the reinforced concrete columns that are sold on road sides in Ghana, these bits of modernist technology form the physical frame within which ways of living that at times contest modernist thinking can take place.



## 5.5 Guest house



6.8 Outdoor rest area, KNUST campus, Kumasi, 2001 (photo Hannah le Roux)

My own home during this visit was the university guest house. Like many institutional buildings, it was maintained, watched, and cooked in by several workers. There were no houses nearby where they or the builders on the site next door might live. Instead, they retired at lunch time to a small patch of open ground over the road from the guest house (fig 6.8). While this appeared at a distance to be an informal arrangement of material, or even a dump, on closer inspection it is a carefully laid out place of rest. The ground is swept clean. Broken branches are laid out to form seats, and table tennis is set out on some trestles. A photograph of the opposition candidate in the previous elections is nailed to a tree that shades the space.

While I am not really sure what happens in this place, I could recognise that it had been carved out by people who were made to be invisible in the ways that the modern campus was set out and run. While there is housing for senior staff, and some accommodation for established



workers, there is no cognisance given in the original campus plan of the numbers of informally employed staff who wait on the official employees. Using their invisibility as a cover, these workers have appropriated not the material they were given, since there was none, but the very absence of accommodation that is conveyed by the blank spaces of the landscape plan.

Such gestures undermine the modernist vision of site as a landscape for the enjoyment of the eye and point to the persistence of local ways of using the landscape. They also point to the climatic inappropriateness of the campus's planning from the perspective of itinerant workers who are forced to walk long distances home in the heat of the day.

## **6.6 Conclusion**

Fifty years after it was built, the campus at Kumasi functions as a critique of the sorts of bodies, sites and boundaries that were imagined in tropical architecture.

The two modern buildings in these examples were designed with certain embodied uses in mind. The complex, interlocking systems of the engineering block were designed to work with a large and coordinated collective body who would enhance its mechanical functions. The transient space of the staff house was imagined for a foreign visitor who would disappear without trace at the end of a contract. The practices of use that happen today at times maintain and at times contradict the original functions for which these buildings were planned. The third space, the little rest room under the shade of a tree, indicates a more radical appropriation, in which the spaces rendered absent in modernism have been [re]occupied.

The orders assigned to the landscape, whether in its function as an object for visual enjoyment, or as a way of spacing uses, have been undermined by the way it is used today. Mrs Hammond has covered her windows with curtains rather than looked out at the view, acknowledging, unlike the architects did, that this landscape is inhabited by sometimes curious people. Informal places where goods are sold, or workers rest, have



been set up alongside once monofunctional areas for work or residence.

Finally the definitions of proper, modern ways of making spaces that respond to climate have been undermined by the many contradictions between modernist logic and the everyday ways in which spaces are viewed and remade. While the maintenance of a modernist building as it was fifty years ago makes it apparently modern, for instance, it also means it is no longer modern. Rather it fits into a particularly local logic.

The condition of the spaces and buildings of Kumasi campus fifty years after it was planned points to a situation, perhaps a new discourse, within which western modernism is simultaneously maintained, fractured and radically reused. These contradictions between these practices and their setting show that the embodied dimensions of climatic design are neither universal nor stable. As they enact their agency, Ghanains are exposing the holes in the western “logic of climate”. They have found it possible to weave alternative practices that are in their own terms effective responses to local weather through the fabric of tropical architecture.



## **7. CONCLUDING REMARKS**

### **7.1 Summary and conclusions**

In extending the programme and forms of modernism to new sites, the architects allied to the modern movement developed specific approaches to climate. In the case of British trained architects in West Africa, certain expert practices were promoted and practised to deal with the hot and humid conditions they encountered, particularly during the period of intense building activity between the end of the Second World War and the era of independence. The concept of “tropical architecture” was used to describe their architecture in the metropolitan media.

This thesis has endeavoured to outline this period and its climatic thinking. Using the approaches of discourse analysis and post-colonial criticism, it has engaged with questions regarding the identity of climatic thinking in tropical architecture. In contrast to the popular current conception of this as a neutral approach, it has built up an understanding of it as a form of modernist and colonial discourse, as well as discursive field in its own right. As such, it is allied to ideological forces, particularly those that operate between a metropolitan centre and the marginalised periphery over which it exerted its dominance.

By using a methodological approach that traces three key concerns - body, site and boundary - through this discourse, the thesis has outlined some of the qualities and consequences of modern climatic thinking.

The concept of tropical architecture is one that is built up through institutional arrangements. The media played an important role in promoting certain practices and disseminating them between the metropolis and the peripheral sites where tropical architecture was built. Educational institutions and research bodies similarly tied the discourse to the spatial logic of the modern colonial system. These arrangements created a system for the dissemination of the discourse that continued into the post-colonial era. The thesis argues that this embeds certain colonial and modernist traits into contemporary thinking about climate.

One negative consequence of the widespread dissemination of the concept of tropical architecture is the exclusion in its representations of local practices. Although climate is a local feature, this is represented as a generic “tropical” one. The essentialism that underscores the cartography of climatic thinking is reproduced in images of tropical sites in which the local is either erased, or represented by a few iconic elements.

The material choices made by architects also reflect essentialist thinking. The erasure of local practices and places, which were undervalued in this thinking, were displaced by the use of universal solutions and technologies. In many of these material solutions to climate, architects made decisions that were beneficial to colonial interests and extended the project of modernism.

In the discourse of climatic responsiveness Africa is often seen as a binary other to the west. Architecture appears as a mediating structure between an interior that represents a paradigm of western order and the exterior world or background, represented as wild and primitive, into which it is set. The boundary of the building, whether made to appear transparent, or ornamentally treated, is used to express these contrasts. In descriptions of such expressions, however, the attribution of native or vernacular technologies is always downplayed and the virtuosity of western architects celebrated.

Climatic discourse also bears on the bodies of the users of the buildings. Their comfort, measured in empirical terms, is seen as the measure of success in design. These bodies are imagined as functional, rather than cultural entities, except where they are nominally differentiated within the logic of colonialism or labour. Such thinking schematises or replaces the complex interplay between place, social identity, temporality and weather that is typical of vernacular architecture. It helps to install a global and atemporal way of being and working in its place.

Seen retrospectively, however, the climatic thinking in modern architecture in West Africa has neither been entirely influential, nor totally rejected. Taking the example of three spaces in Kumasi, it appears that tropical architecture frames a variety of social practices that alternately negate and accept aspects of its formative thinking. Alongside this,