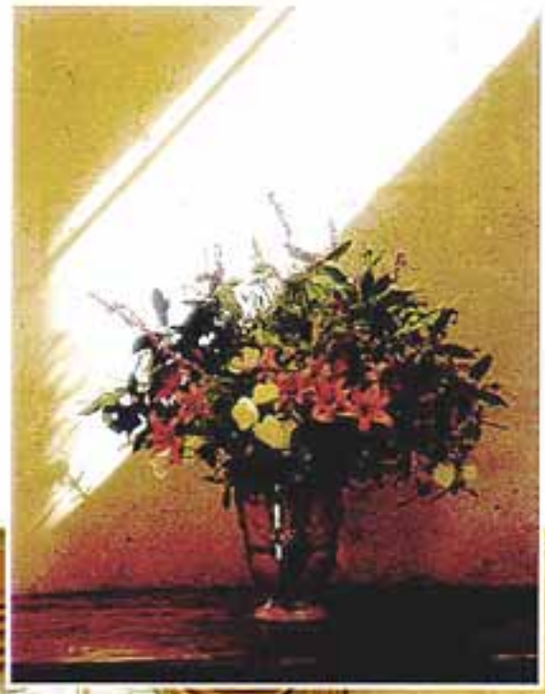

This page left: Sun, shadow and effect in a house that lives with the sun all year round. Below: Light and warmth flows through a wall of windows facing north into the formal lounge. In summer this room is cooled by shade from the solar pergola and minimal exposure to the southern sun. Note the rarely used fire place.

full of light. There's a nice sense of well-being when you are neither too hot or too cold; you sleep comfortably at night and, very importantly, you sense you're doing something to help reduce greenhouse gas emissions."

All this is simply because theirs is a classic example of an energy efficient piece of architecture. As you leave that magnificent entry through the passageways to the living area, you are heading north. On the cold, crisp but sunny mid-winter's day *Homes & Living* visited, the advantages of solar design were immediately apparent. Bright light streamed in. It was as warm as toast. The reason was quickly apparent. The house's northern facade differs greatly from the south with a wide expanse of glass allowing sunlight to stream into the living areas. Upstairs, bedrooms with windows similarly facing the sun were warming up.

Before we talk about the comfort zones this free source of heating creates, it is probably useful to quickly review some main factors for energy efficient solar design. They are:

* appropriate home orientation on the block and internal room layout
* windows positioned to capture warmth from the winter sun and provided with adequate shade in summer
* adequate use of high thermal mass (heat absorbing) materials inside the house to lessen uncomfortably high temperature variations
* sufficient insulation to reduce heat transfer
* good draughtproofing and control of ventilation both indoors and out.

Jane and Hugh's house meets all these criteria, and more. It is a dwelling that demonstrates architecture can blend art and culture with technical and scientific expertise.

Firstly, and most importantly, it is orientated exactly north. Secondly, as you will note from the photographs, abundant winter sun flows into living areas courtesy of a clever contrivance - the solar pergola. Carefully calculated angles at which overhead panels are slotted into the pergola work like this. In winter, when the sun is low in the northern sky, the panels' angles let sunshine penetrate far into the house. In the process, heat-retaining earthy coloured terracotta floor tiles are warmed up. In summer, with the sun high overhead, the panels present a flat surface - somewhat like a verandah, providing shade.

This leads us to high thermal mass. Heat absorbing materials like bricks, stone, rammed earth and concrete have what is known as "high thermal mass", which means they are good at storing warmth in winter and remaining cool in summer.

The Webb-Ware residence is, truly, a mass of high thermal mass. The thick limestone walls - each filled with insulating polystyrene - and those terracotta floor tiles store winter daytime warmth and gradually release it at night.

With this warmth stored away, it is logical to maximise its availability. This is where a more active solar phase in employed. High up on a wall of that grand entry are the vents of two big fans. Thermostatically controlled , they work away day and night, moving warm air in winter, cool air in summer, around the house. The