

## OAK ALLEY: THE HEAVY MASS PLANTATION HOUSE

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### ABSTRACT

Oak Alley, a southern Louisiana plantation house was constructed in the 1830's. The climate responsive strategies employed in the house and site design have been identified and documented through field tests, model analysis and occupant interviews by Brian Andrews and Brian Spencer, working with Dr. Eugene Cizek and Professor Susan Ubbelohde. This paper discusses the background of "bioclimatic design" strategies developed for the Gulf Coast climate of the U.S. Three major factors in the success of Oak Alley's response to climate are examined: the dynamic heavy-mass envelope, the migration of the occupants, and the contributions of ritual, contrast, and synesthesia to thermal comfort. Conclusions address the value of studying historic examples and the complexity of a truly responsive and comfortable design.

### 1. INTRODUCTION

In comparison to the rest of the continental U.S., the Southeast, and especially the swamps and bayous of Louisiana have epitomized the relative tropics. A world of palm trees and Spanish moss, dripping with humidity and crawling with insects, the South is home to the passions of William Faulkner and Tennessee Williams.

Understanding the South's nearly mythic role as our representative hot humid climate clarifies the ease with which we have assumed that tropical architectural strategies might be appropriate. Thus the "low heat capacity walls and roof, maximum shade, maximum ventilation" described by Fitch and Branch for the tropical rain forest in their seminal article<sup>1</sup> have crept into our general consciousness as somehow applicable design strategies in the Deep South.

### 2. BIOCLIMATIC DESIGN GUIDELINES

As we became better at both describing the climate and understanding implications for architectural response,<sup>2</sup> we also began to look at 19th century architectural prece-

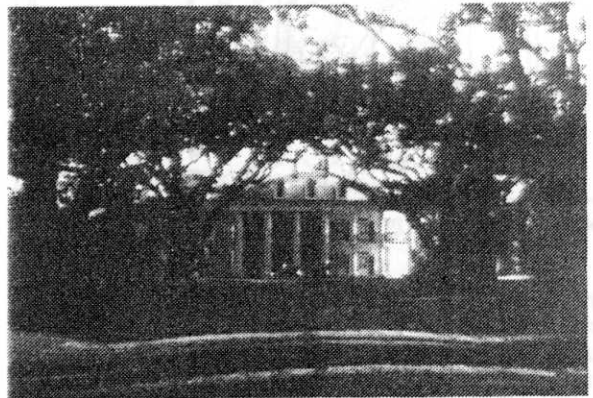


Fig. 1. Oak Alley Plantation, Vacherie, Louisiana.

dents. This search was ostensibly for clues, but functioned primarily as confirmation of the newly developed guidelines.<sup>3</sup> For the northern U.S. and the Southwest, passive designs could provide comfort for most of the year. The basic architectural strategies suggested for orientation, aperture, and envelope and mass characteristics tended, in general, to work through the annual patterns of seasonal change. However, in the Southeast, our sophisticated analysis brought us to a difficult position; a set of conflicting guidelines.

In Regional Guidelines for Building Passive Energy Conserving Homes (1980), the potential of passive strategies for providing thermal comfort was addressed. Chapter 11 for the Gulf Coast distinguished the "primary design condition" as "too hot for comfort" (52% of the year). The recommendations were: 1. Allow wind to ventilate and cool; 2. Protect from the sun; 3. Flatten day-to-night temperature swings; 4. Avoid creating additional humidity. The "secondary design condition", "too cool for comfort", occurs a substantial 36% of the year. However, the recommendations of 1. Letting the sun in and 2. Avoiding infiltration are, along with #3 and 4 above, "less important and should only be considered if greater detail and operational control is possible".<sup>4</sup> This relieves the

