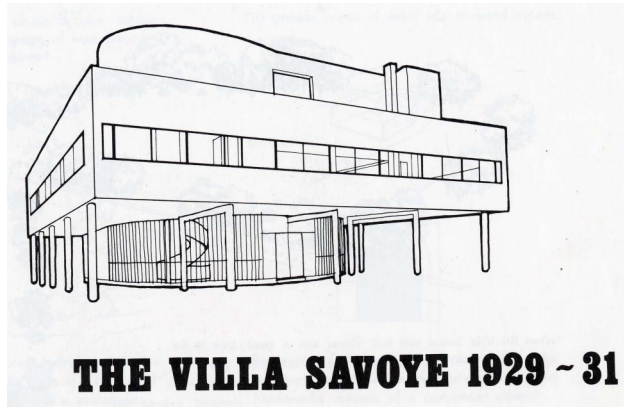


Arch 463
ECS
Fall 2004

Name _____

Quiz #2

"Corbu in the Desert"

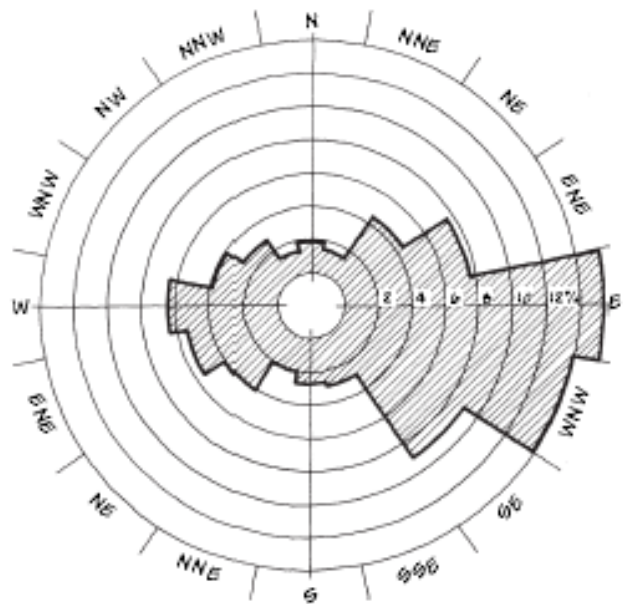


For this problem you are the passive cooling consultant for a client who wants to build a near replica of Corbu's Villa Savoye in the Arizona desert near Phoenix. Your client, Madame Clouseaux, thinks that the building has great potential for maximum passive cooling if some alterations in the plans are made before construction begins. It's your job to analyze Corbu's design and to propose changes that will improve the building's passive performance without compromising the design parti. In other words the most subtle changes are the best.

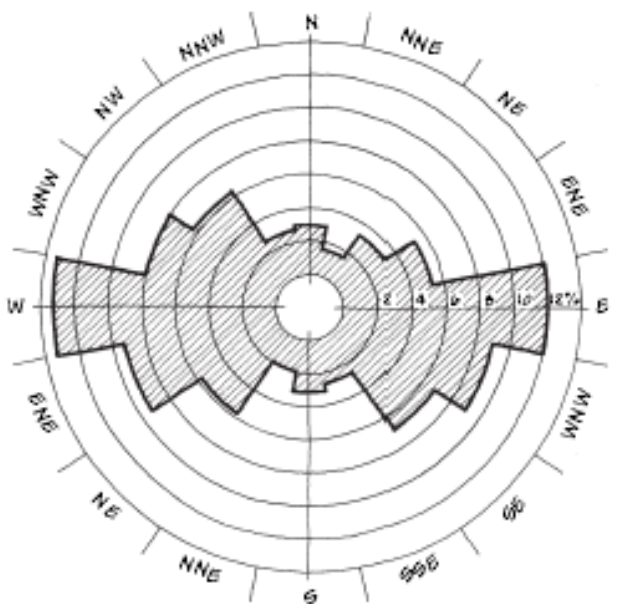
Site and Climate Context. The site is a totally flat one-acre plot with no vegetation larger than small cacti and sage. Diurnal winds blow from the west in the daytime and from the east at night.

Original Building Design. The original building is lightweight construction, featuring stud walls with external stucco and internal plaster finishes. The roof and floor decks are uninsulated, post-tensioned concrete slabs. It used the technology of the day—single pane windows, no insulation, and no caulking or weather-stripping.

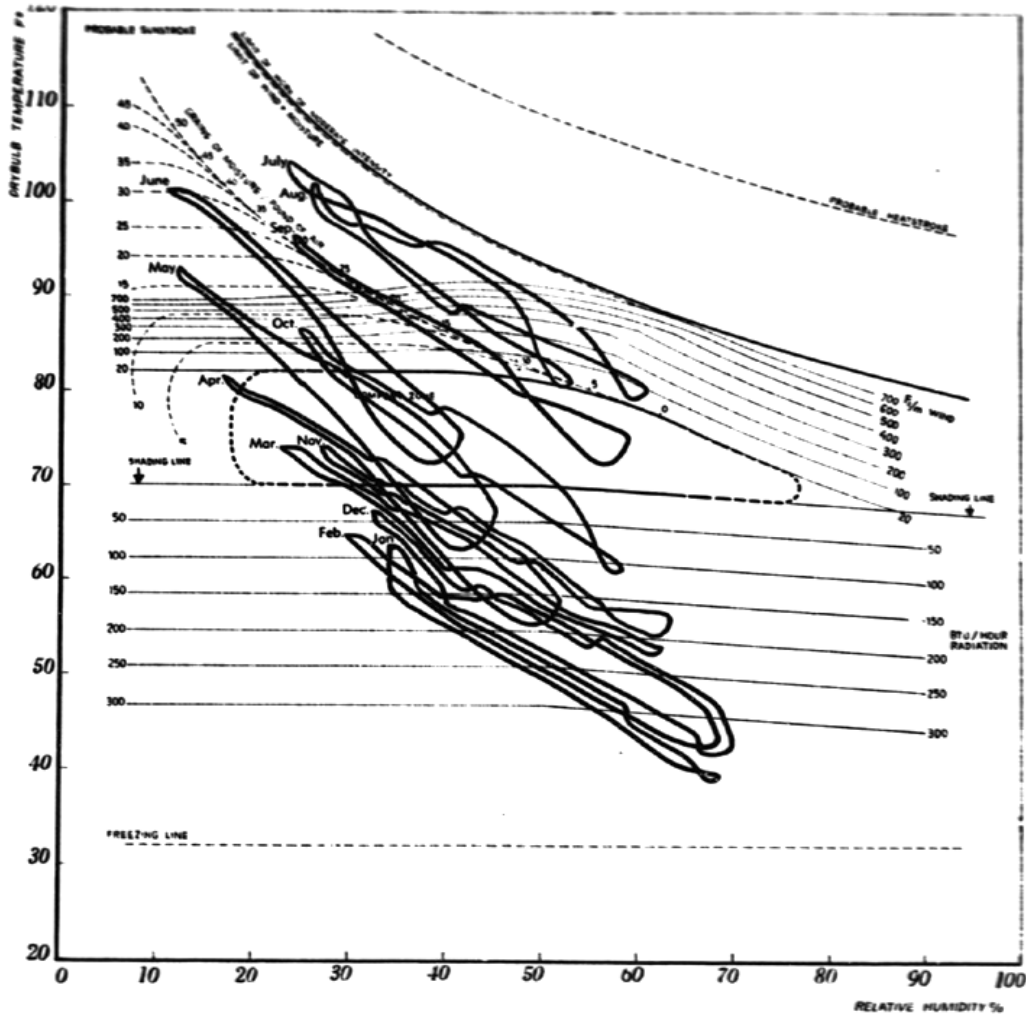
4 WIND ROSE



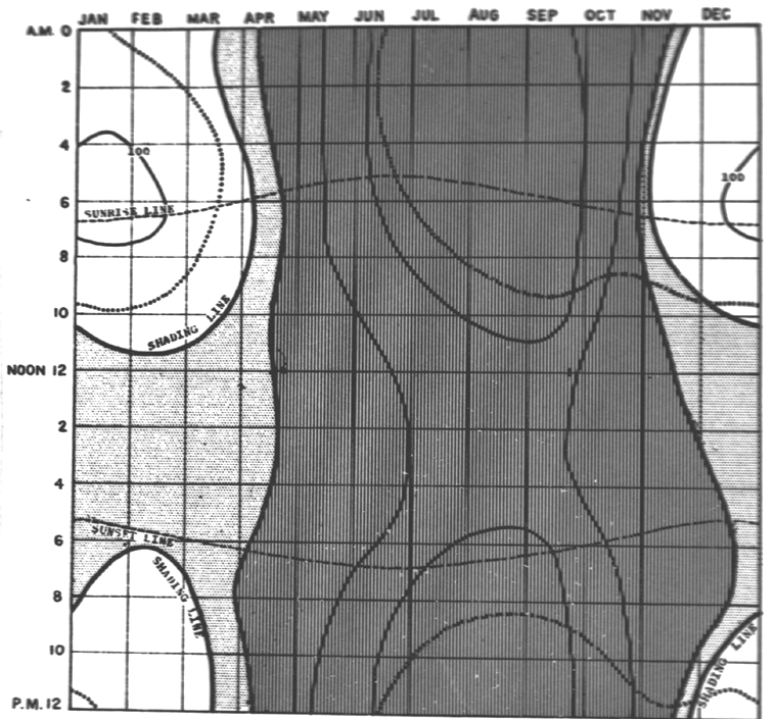
December Wind Rose, Phoenix



June Wind Rose, Phoenix



54. EVALUATION OF PHOENIX, ARIZ.
Bioclimatic registration of climate data.



57. Timetable of climatic needs.

Buiding Analysis

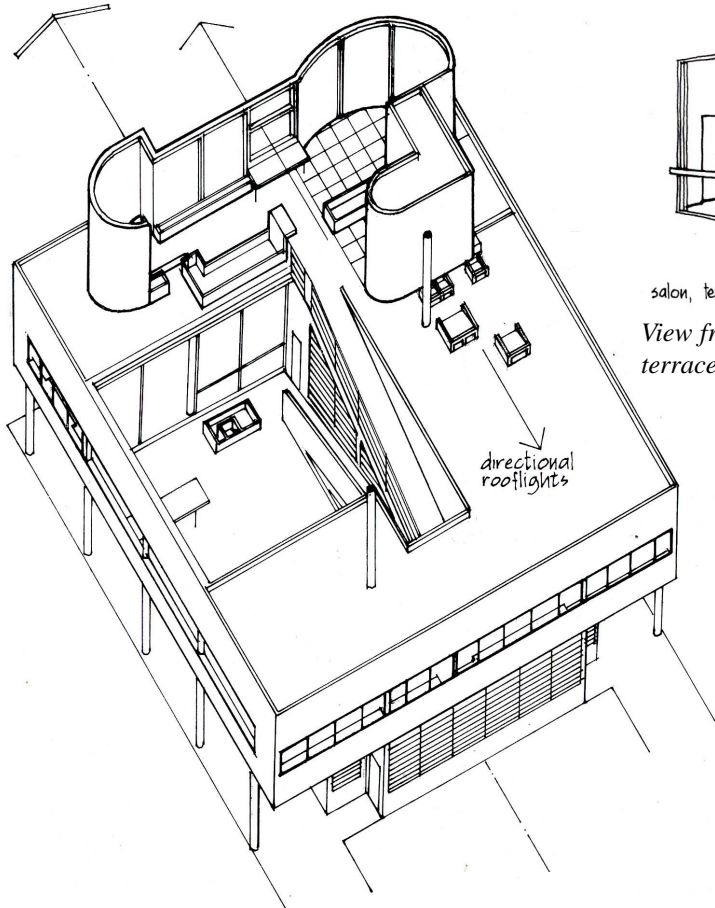
2 points

1. **Point out** two features of the design that are favorable for passive cooling in the desert. **Explain** why you think so.

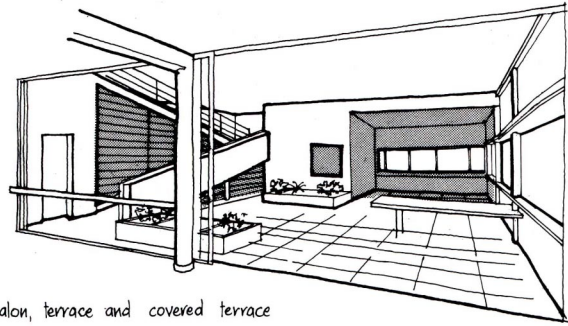
2 points

2. **Point out** two features of the design that must be altered to assure effective passive cooling in the desert. **Explain** why you think so.

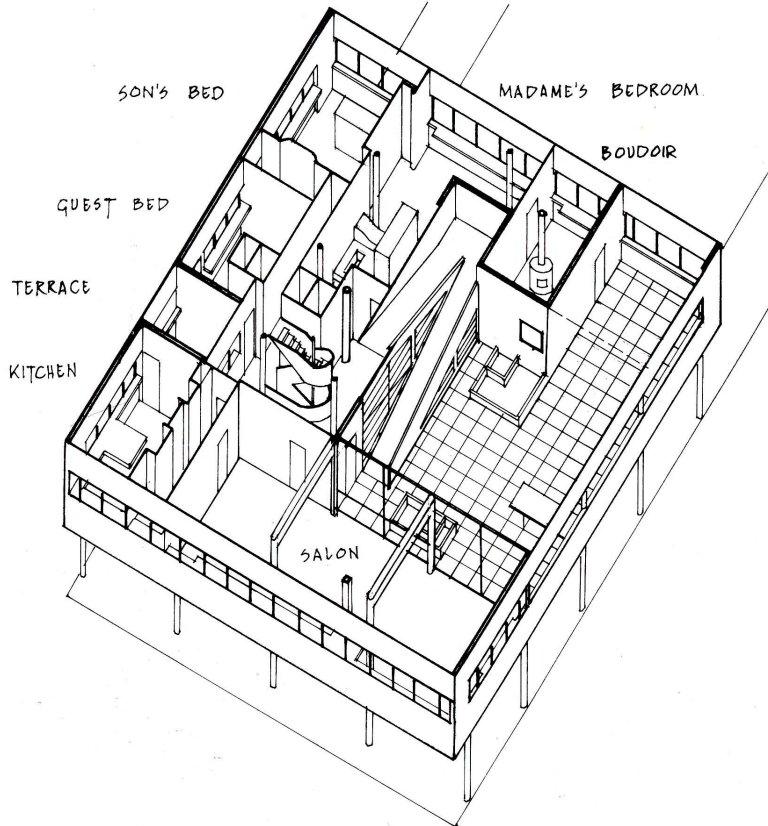
2 points



Building paraline. View from the Northeast..



salon, terrace and covered terrace
View from salon through open terrace to covered terrace..



Roofless paraline. View from the Southeast.

6 points

Redesign

3. **Propose** four design strategies for passive cooling. **Show** how you would implement them in the drawings on page 4 and/or with sketches of your own invention.
Explain how each works toward achieving effective passive cooling design.

