

Climate-Sensitive Vernacular Architecture



1

“Vernacular architecture does not go through fashion cycles. It is nearly immutable, indeed, un-improvable, since it serves its function to perfection...”

—Bernard Rudofsky, *Architecture w/o Architects*, MOMA 1964

... vernacular [architecture] could best be studied from a specific point of view, raising specific questions about topics or themes, rather than chronologically, the way traditional architectural history is studied.

—Amos Rapoport

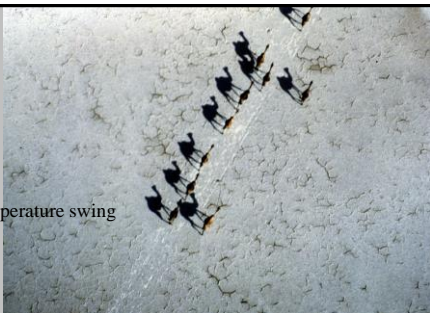
...so the theme here is climate-response theme

2

Hot Arid

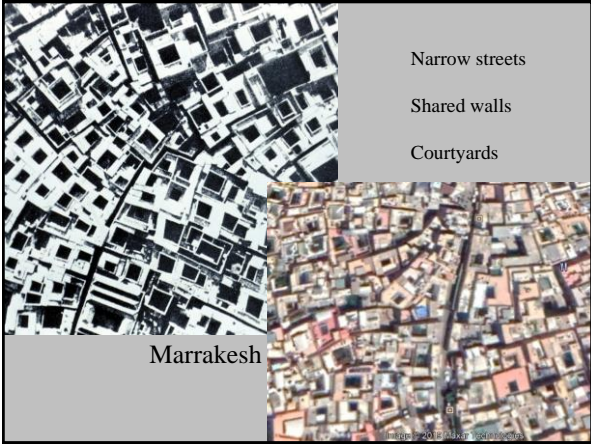
Typified by:

- Very hot daytime
- Sunny sky
- Clear nights
- Large diurnal temperature swing

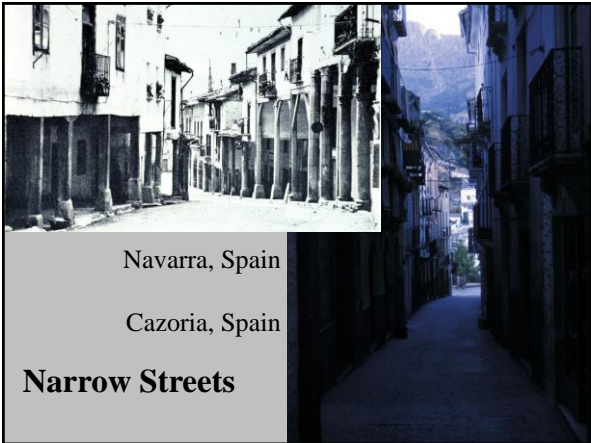


Architectural response: minimize/control building exposure to sun, wind, and light; use site scale shading, evaporative cooling, high mass, and migration

3



4



5



6

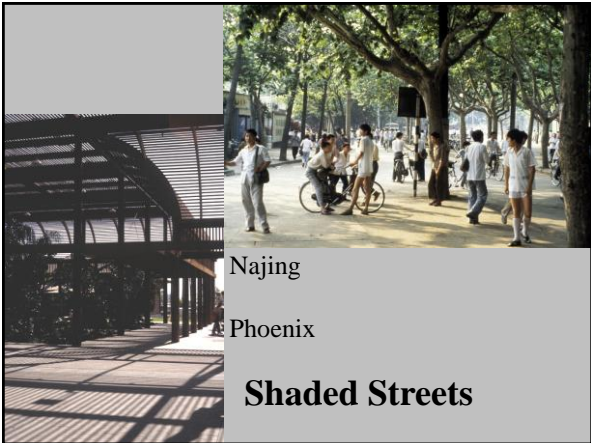


Africa

San Antonio

Shaded Streets

7



Najing

Phoenix

Shaded Streets

8

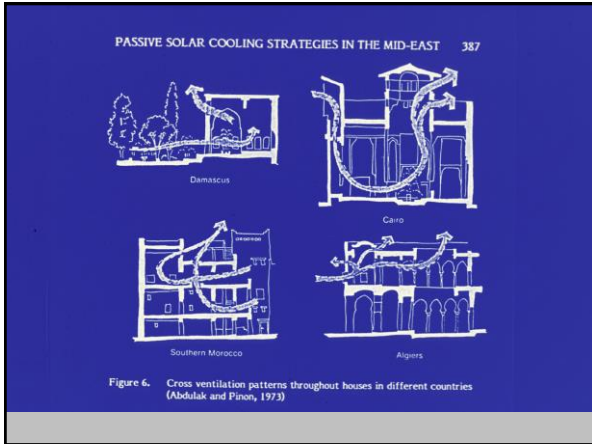


Shaded Streets

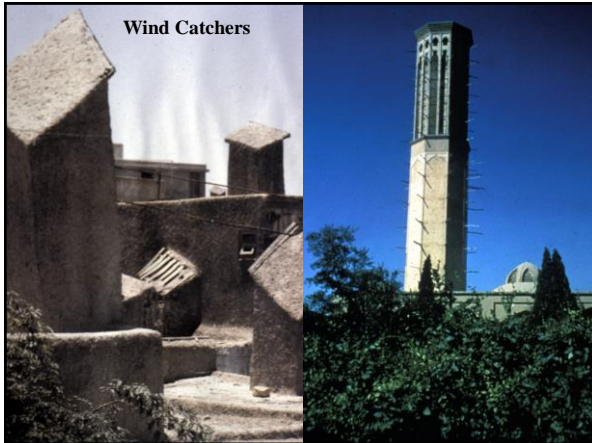
Toldos

Madrid, Spain

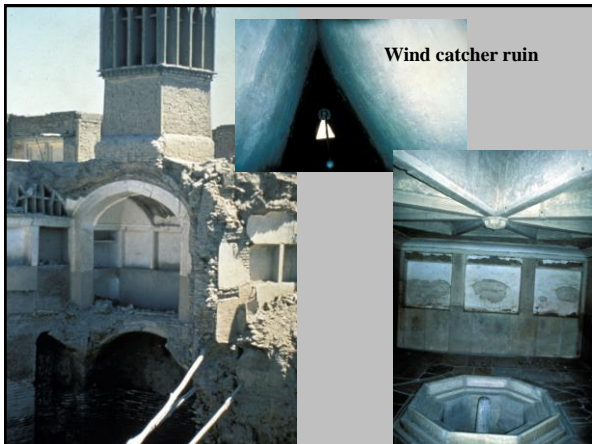
9



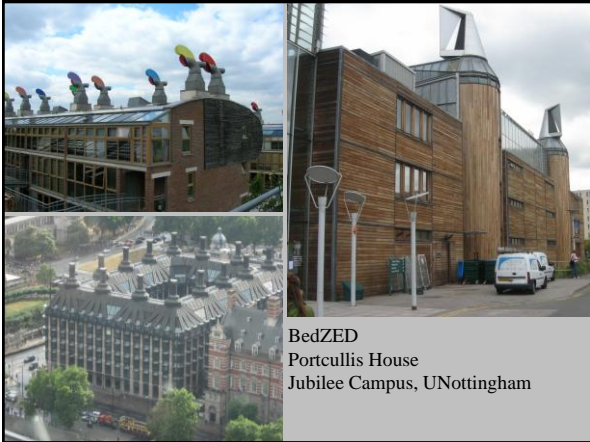
10



11

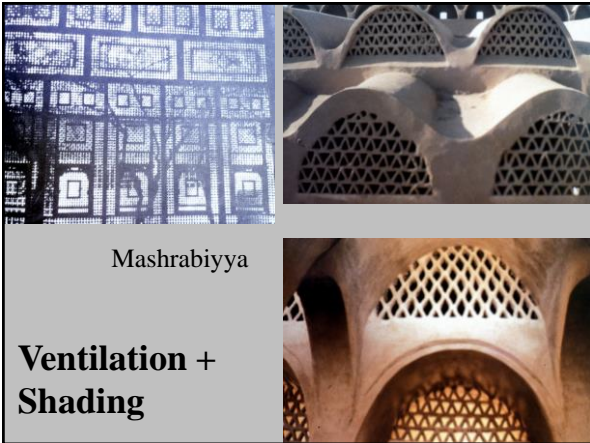


12



BedZED
Portcullis House
Jubilee Campus, UNottingham

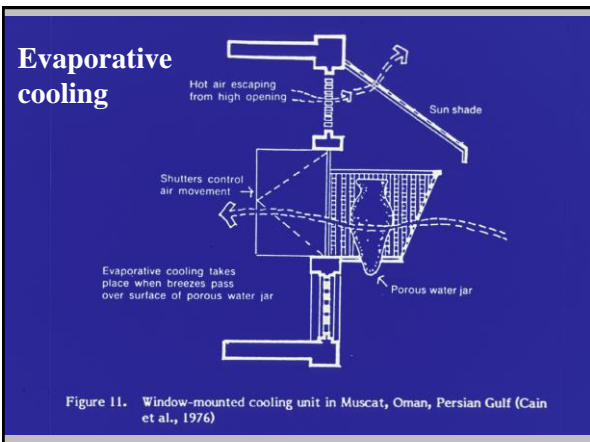
13



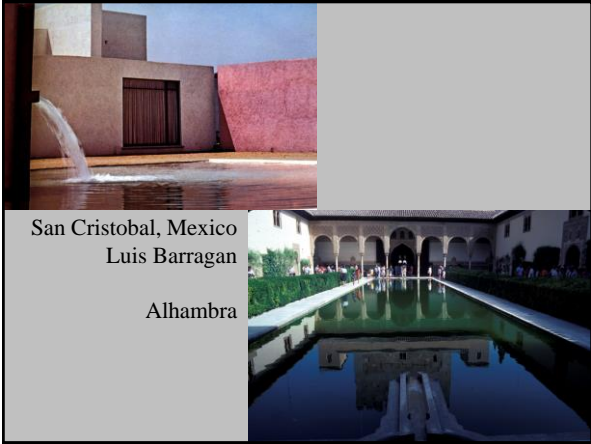
Mashrabiyya

**Ventilation +
Shading**

14



15



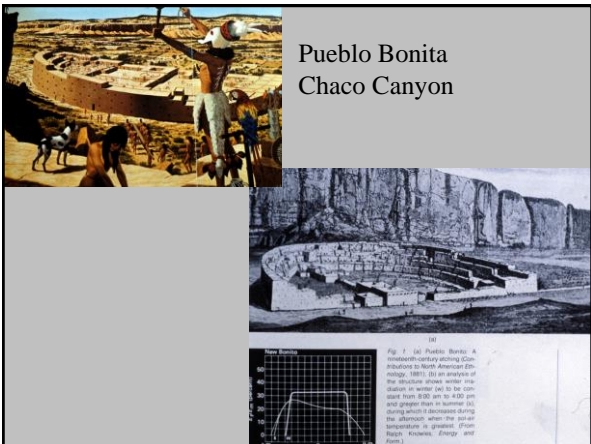
San Cristobal, Mexico
Luis Barragan
Alhambra

16



Ministry of Foreign Affairs
Ryadh, Saudi Arabia
Henning Larson

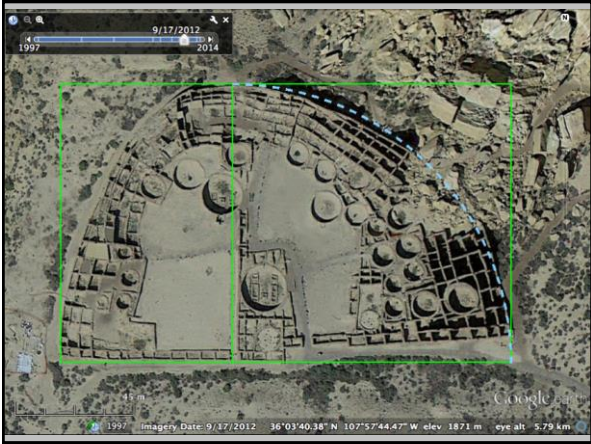
17



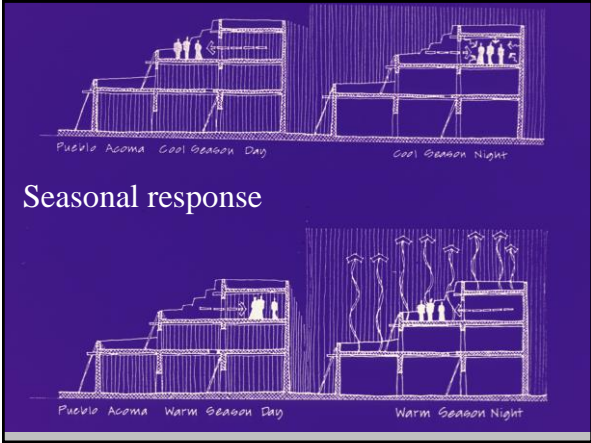
Pueblo Bonito
Chaco Canyon

Fig. 7. 101 Pueblo Bonito, a
mesquite-structure among
ruins in North American
Canyon. 1010. An analysis of
the structure shows winter
temperatures of water not to be
less than 6.50° C to 4.50° C
and greater than 10° C during
the afternoon when the air
temperature is greater than
10° C. Kinsley, Energy and
Time.

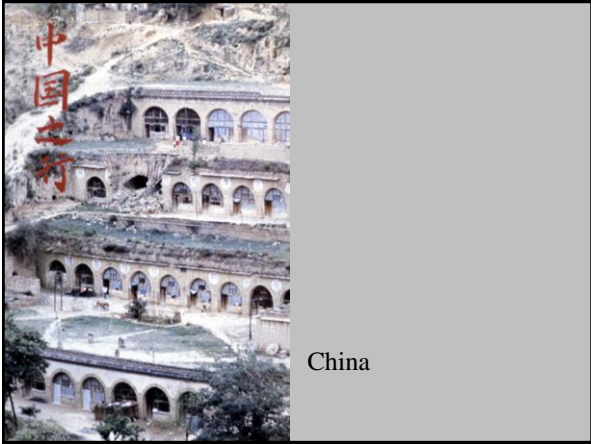
18



19



20



21



22



23

Hot Humid

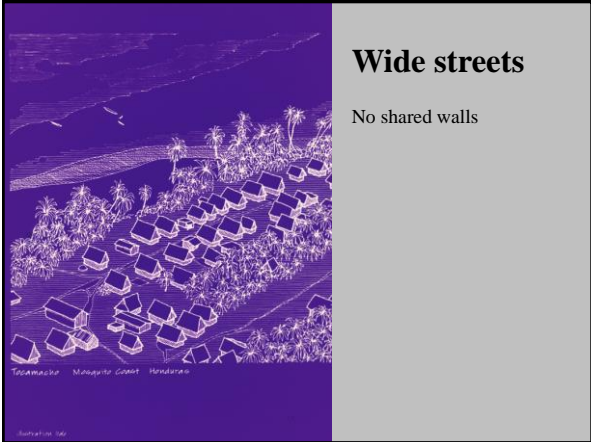
Typified by:

- 90-90 days
- Cloudy sky
- Warm nights
- Small diurnal temperature swing

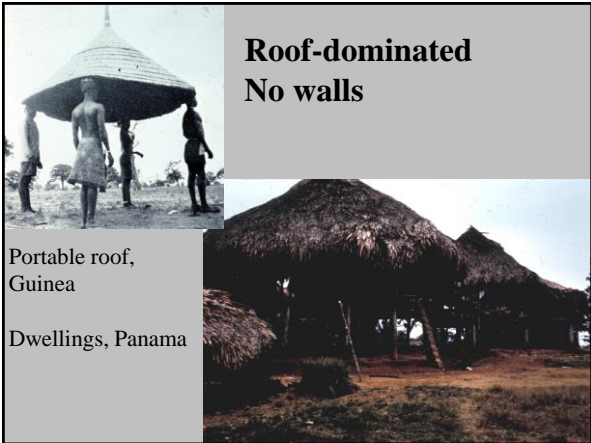
Morning in the Tropics, Fredrick Edwin Church

Architectural response: maximize building exposure to wind, shade heavily, large windows for light and ventilation cooling, low mass buildings

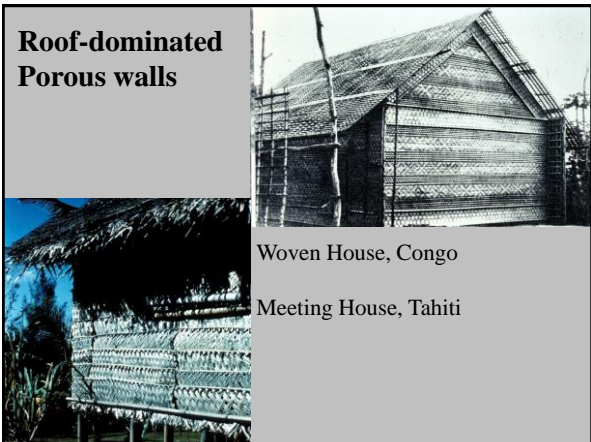
24



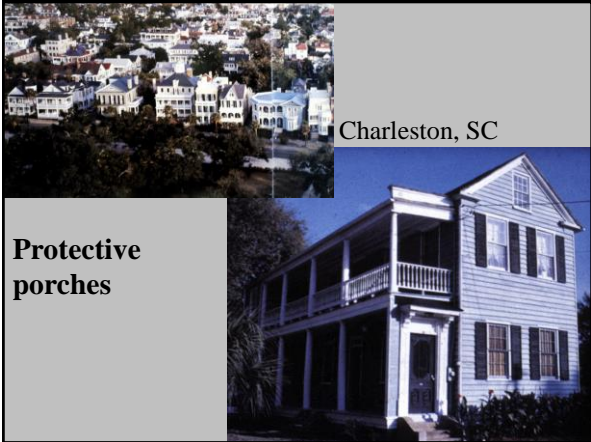
25



26



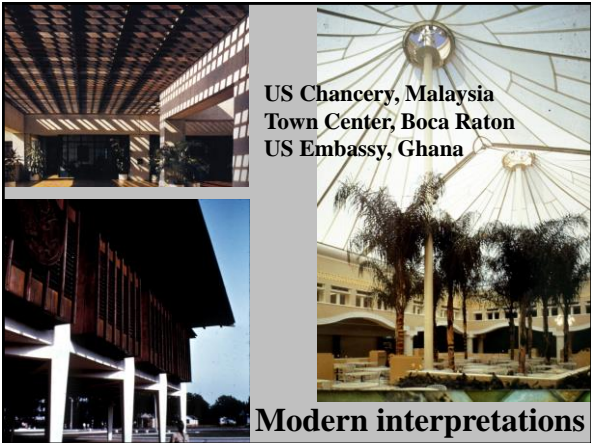
27



Charleston, SC

Protective porches

28



US Chancery, Malaysia
Town Center, Boca Raton
US Embassy, Ghana

Modern interpretations

29



Brillhart House, Miami, Florida, 2014



30

Cold

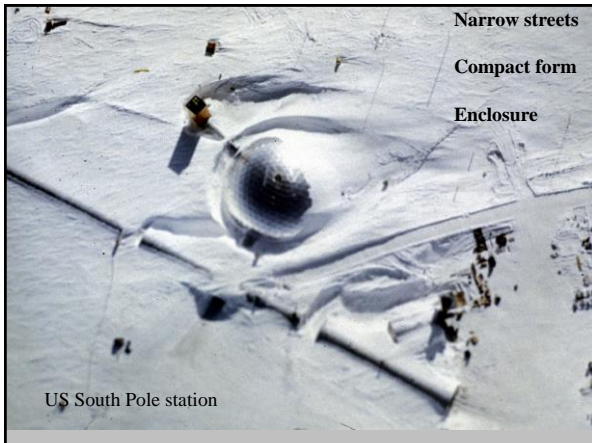
Typified by:

- Extreme cold
- Bitter wind
- Mix of clear/cloudy days
- Small diurnal temperature swing

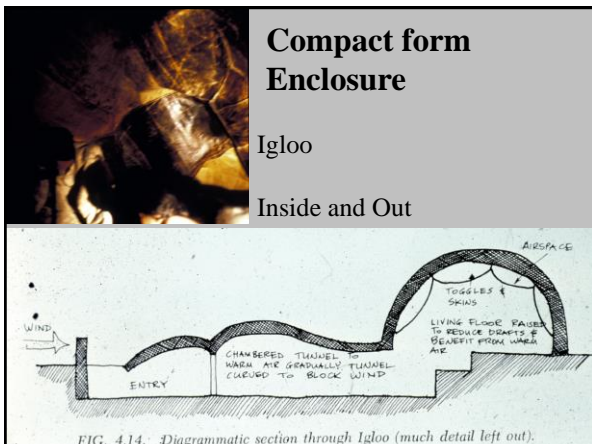


Architectural response: minimize exposure to elements, small windows, compact building form, high mass central hearth

31



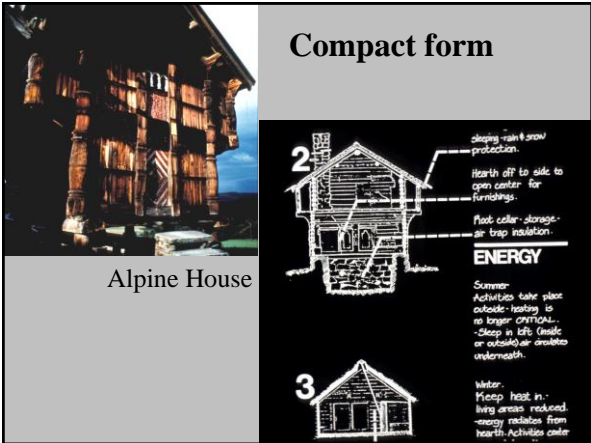
32



33



34



35



36



St. Ursanne
Medieval town

Stein am Rhein
Medieval city

37



Modern cities

Lucerne

Geneva

38



Temperate

Typified by:

- Change, annual/diurnal
- Elements of HA/HH/Cold
- Seasonal weather

Paris, a Rainy Day, Gustave Cailleboitte

Architectural response: dynamic forms that respond to change, use of solar geometry, migration

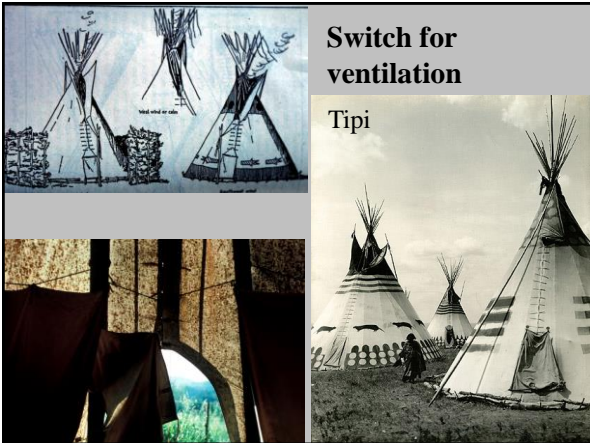
39



- Mix of strategies
- Shared walls
- Courtyards
- Trees
- Open space

Japanese village

40



Switch for ventilation

Tipi

41

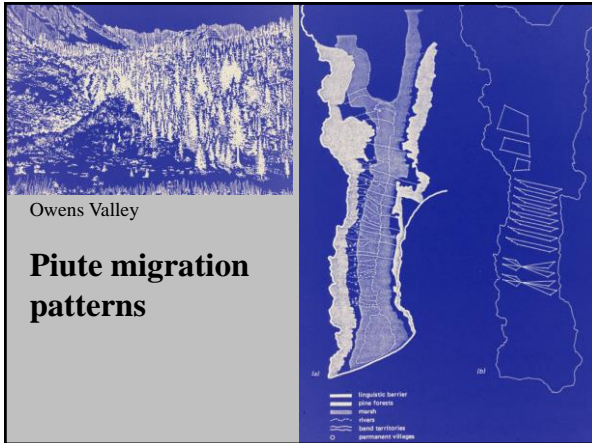


Russian Nenet Tipis

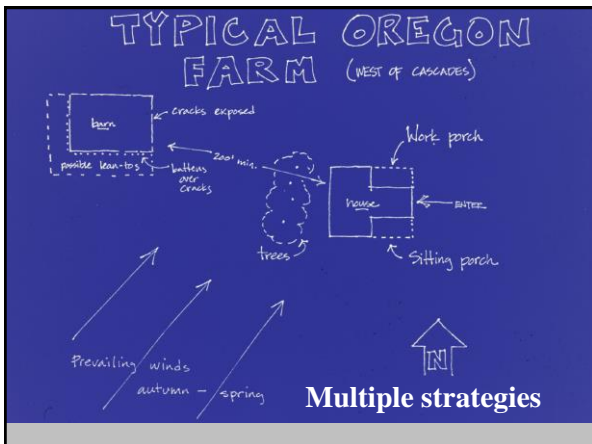
42



46



47



48



Lindstrom House
Bainbridge Island
1979
Morgan & Lindstrom
