

Joseph Lstiburek, Ph.D., P.Eng, ASHRAE Fellow

# Building Science

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## Sour Grapes

# Wine Cellars







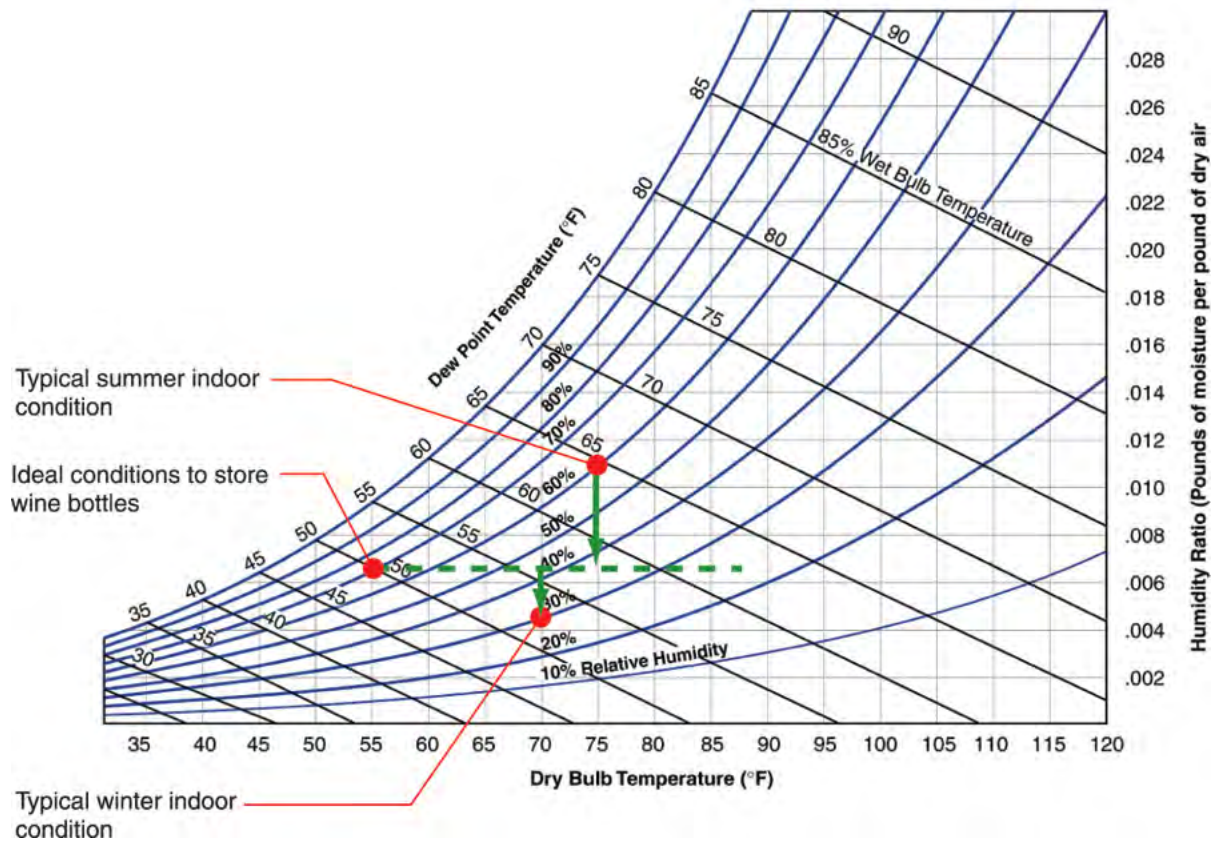


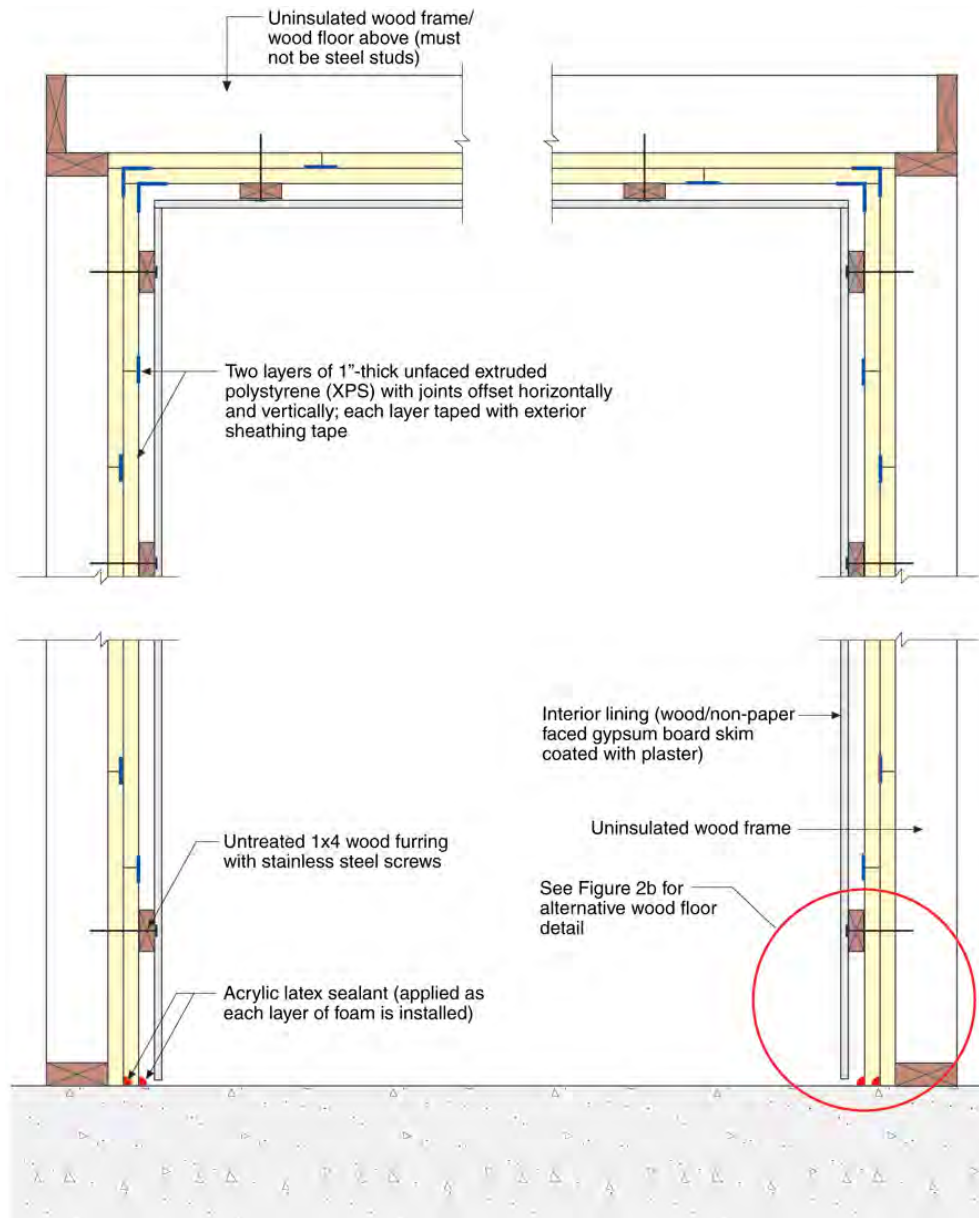


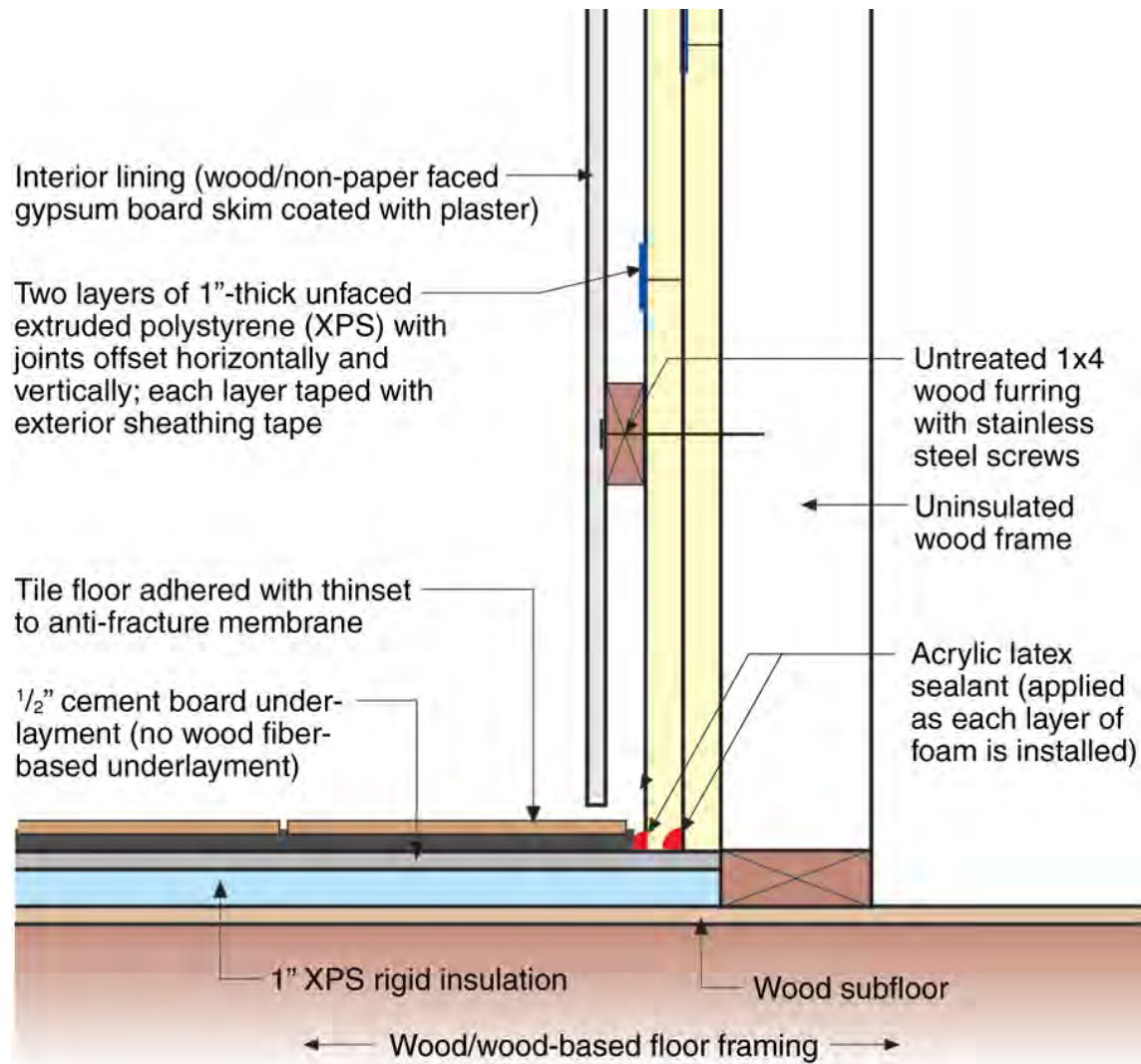




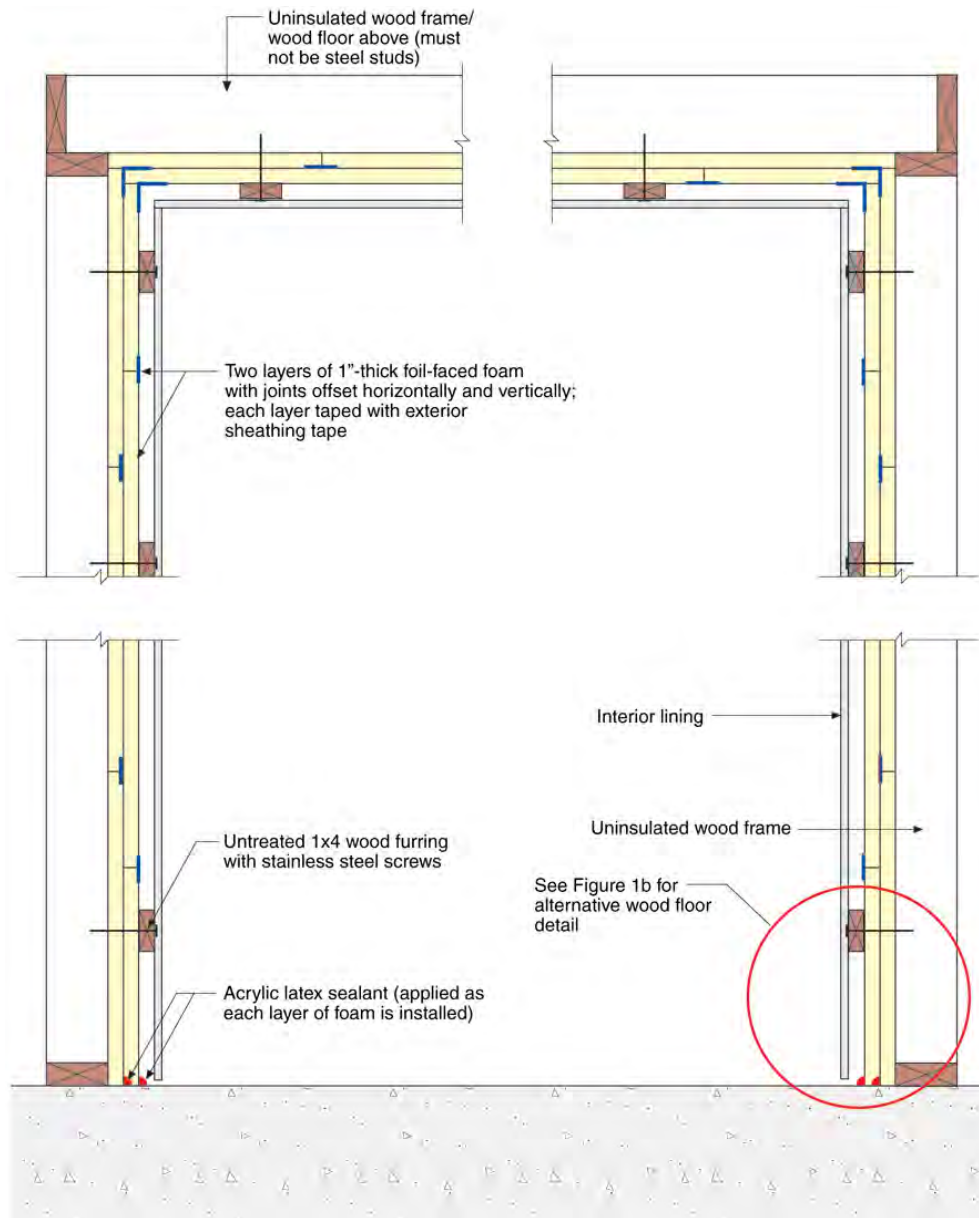


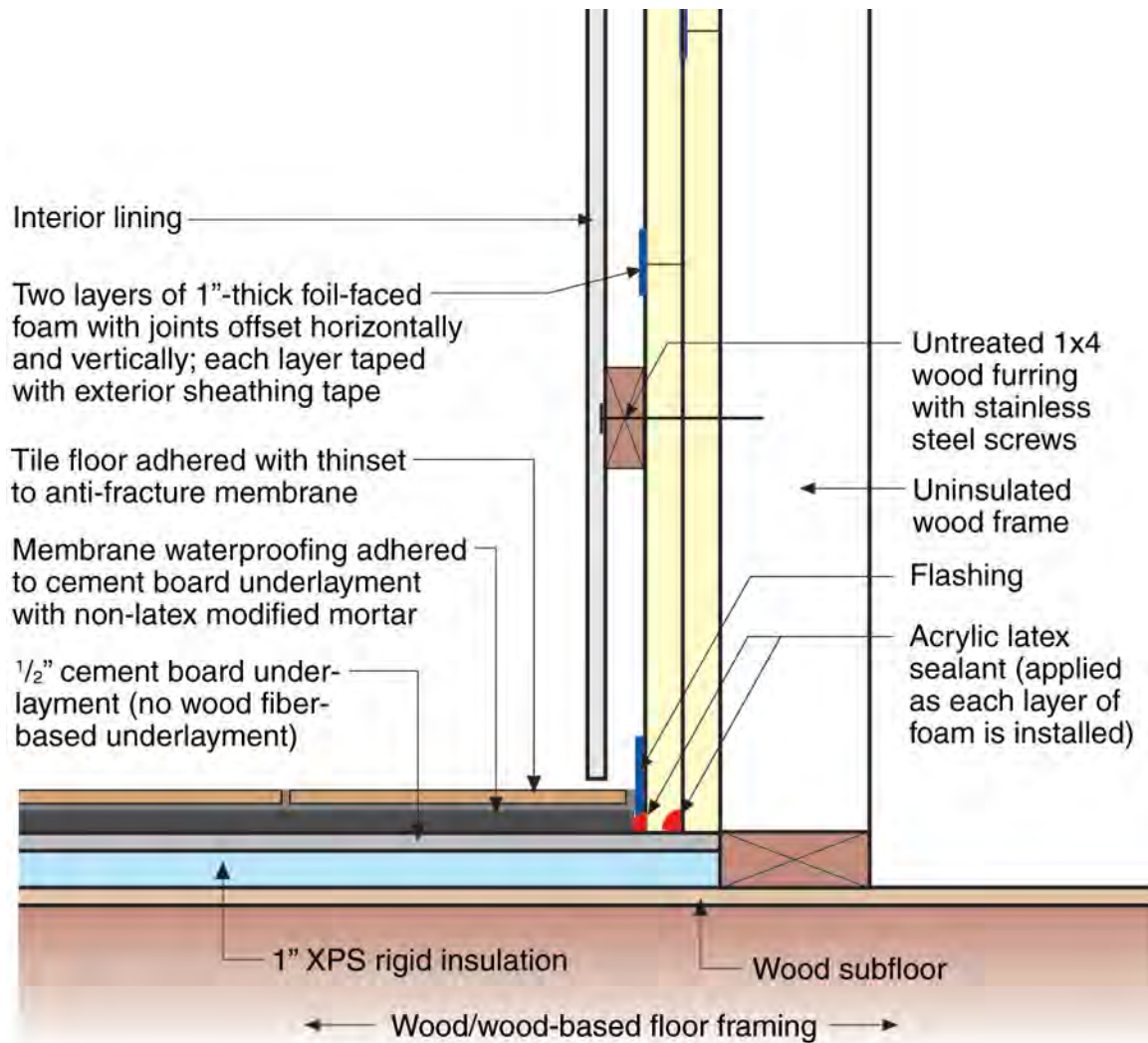




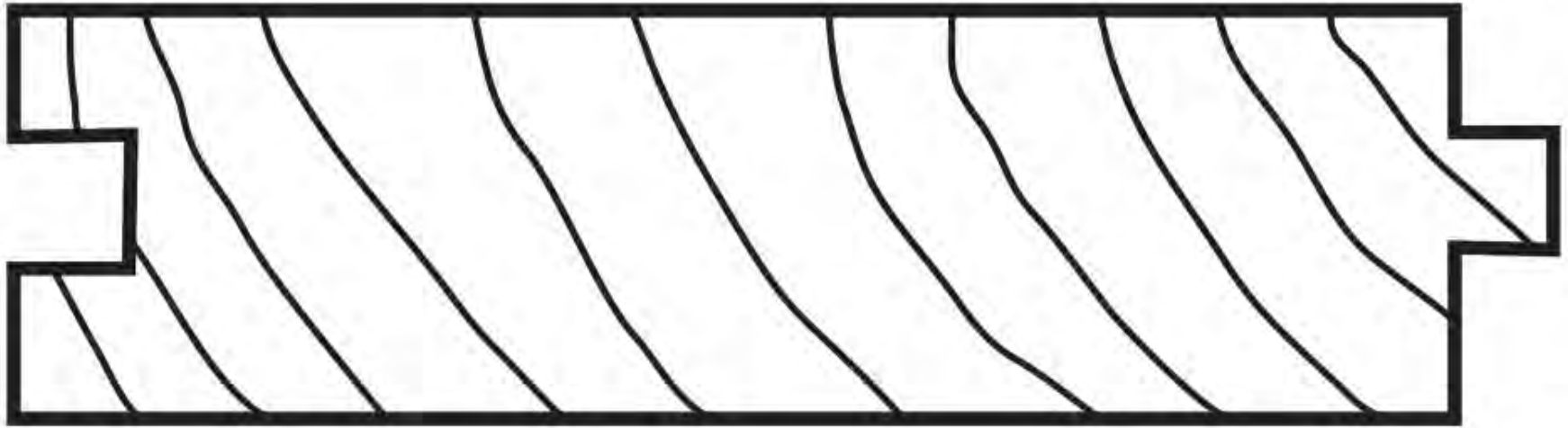


**Alternative on a wood/  
wood-based floor**

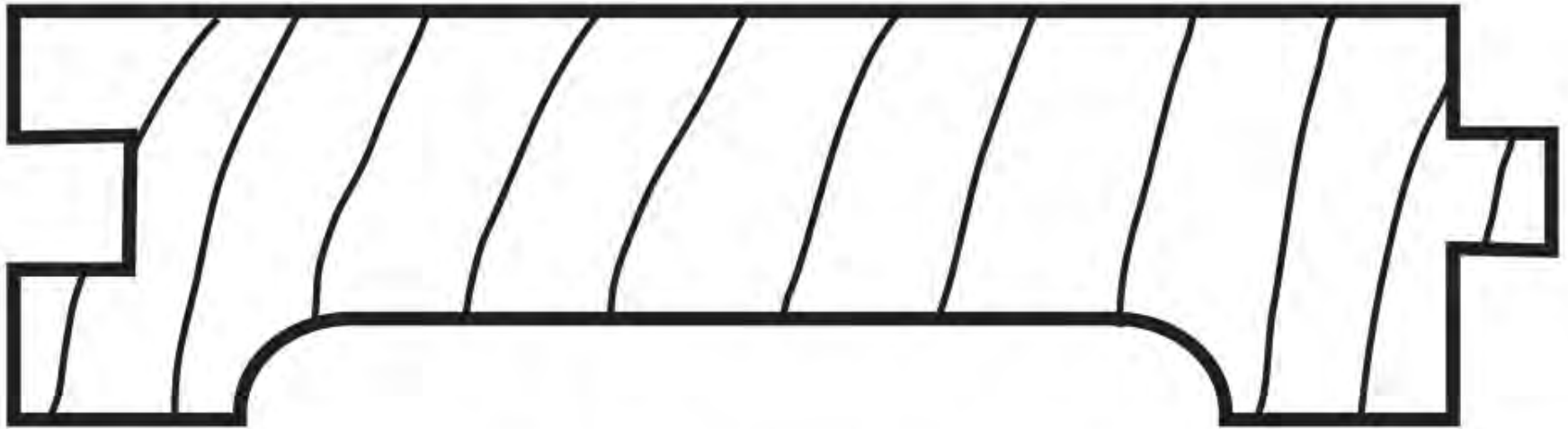




**Alternative on a wood/  
wood-based floor**

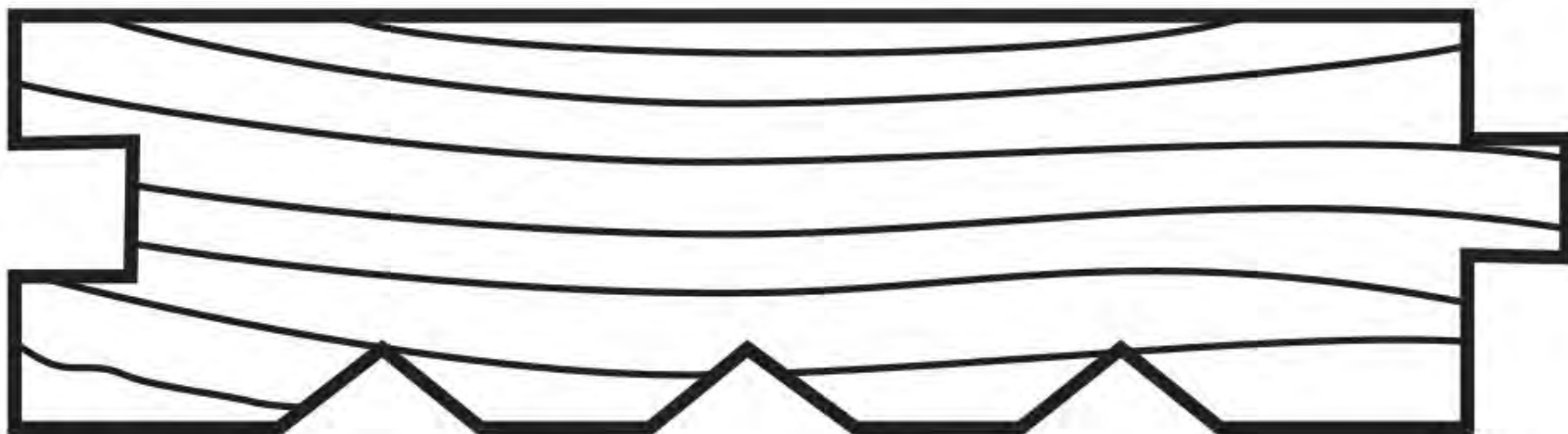


**Plain**

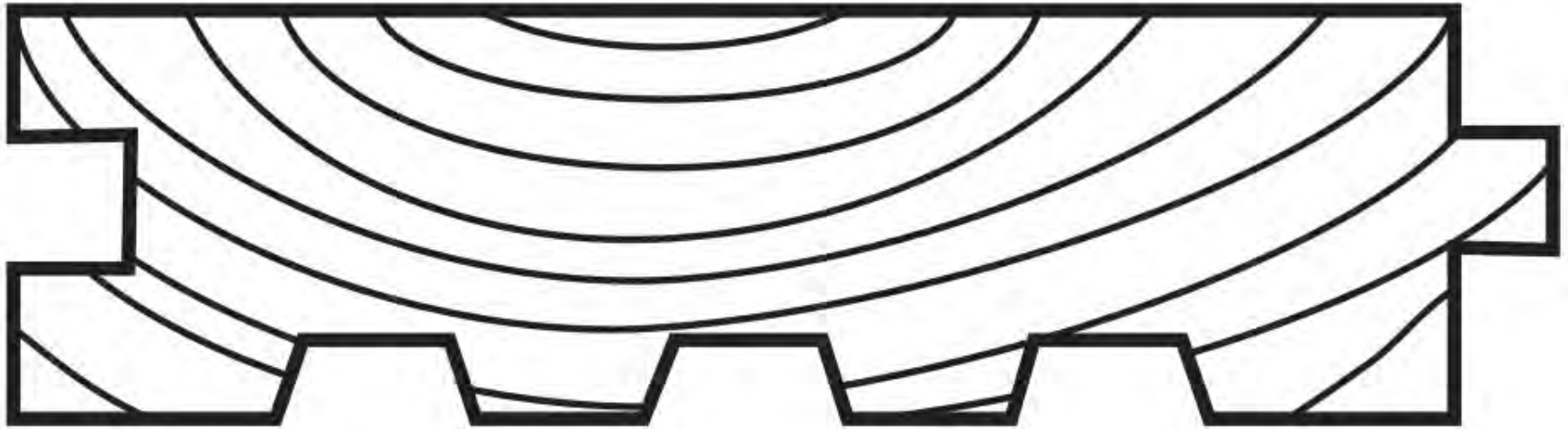


# Hollow Back





# Scratch Back



# Hollow or Scratch Back





What is the function of these holes?



# Hyperbolic Curves

Hyperbolic Curves – two curves

Eccentricity greater than one

Parabolic Curve – single curve

Eccentricity of one



Hyperbolic Curves – two curves

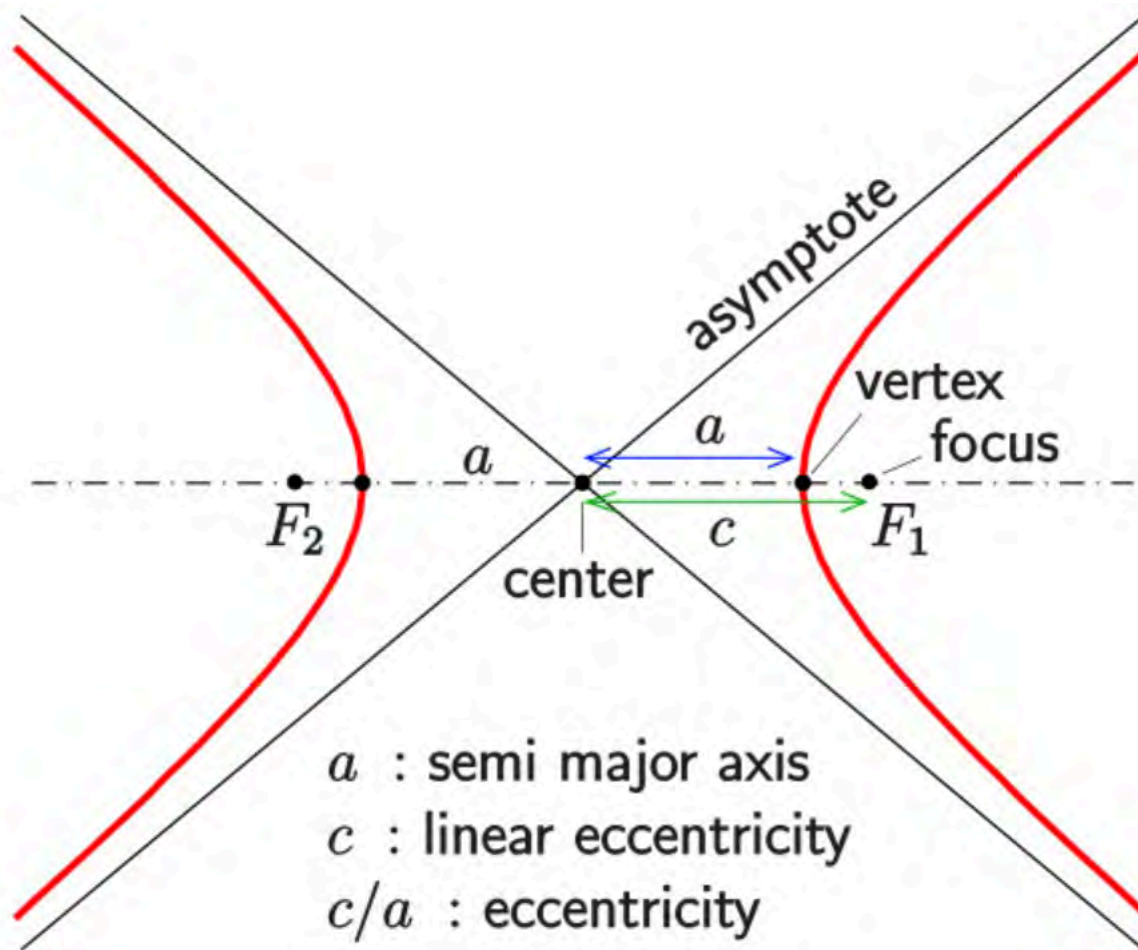
Eccentricity greater than one

$$X^2/a^2 - y^2/b^2 = 1$$

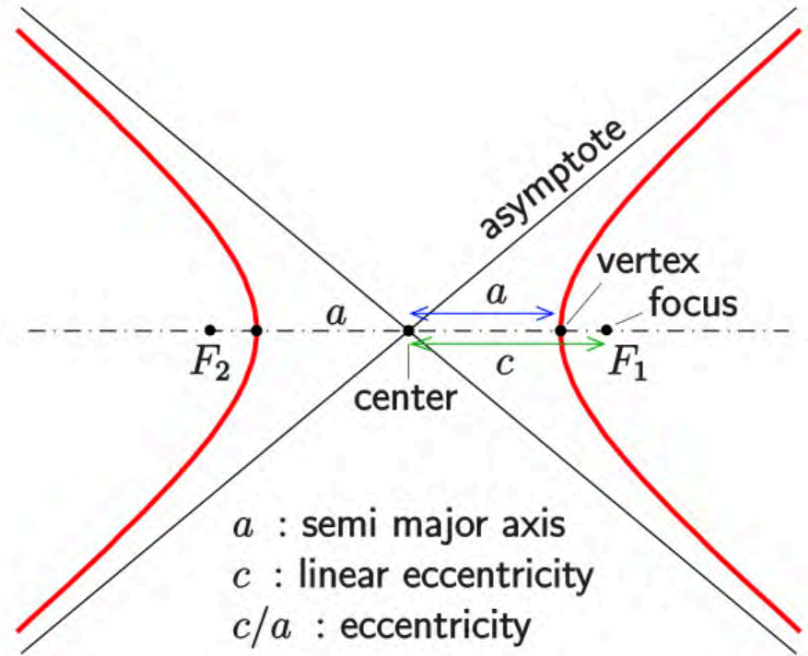
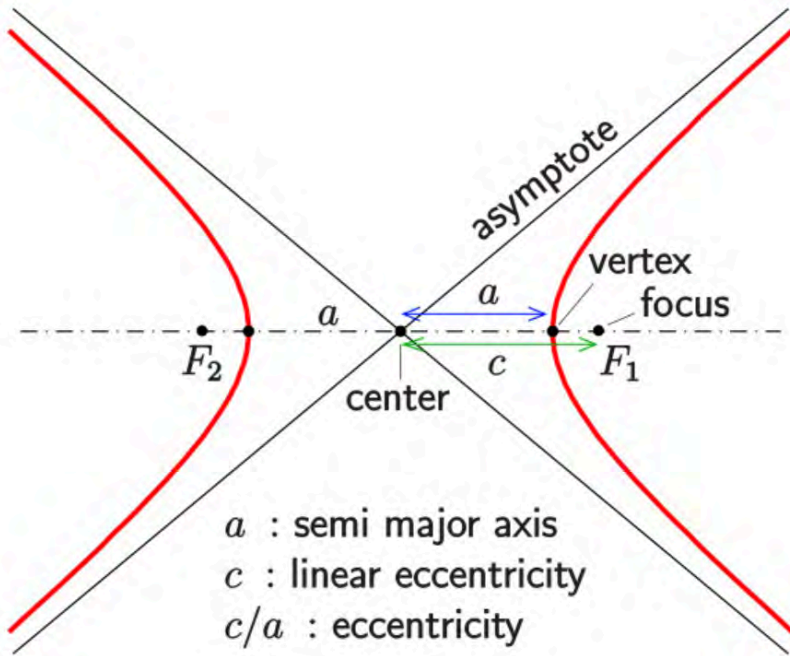
Parabolic Curve – single curve

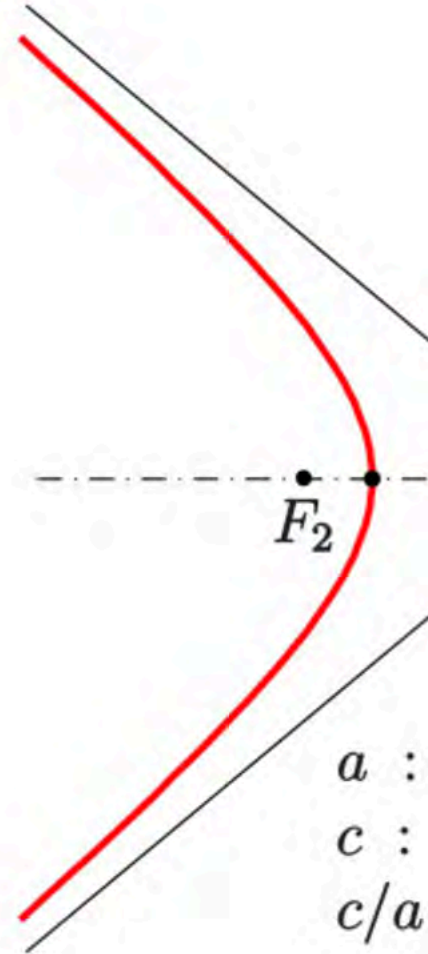
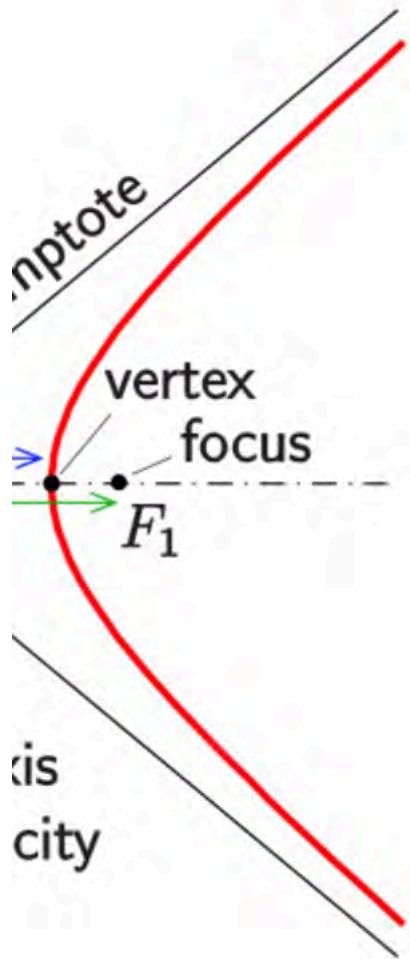
Eccentricity of one

$$Y = ax^2, a \text{ not equal to } 0$$











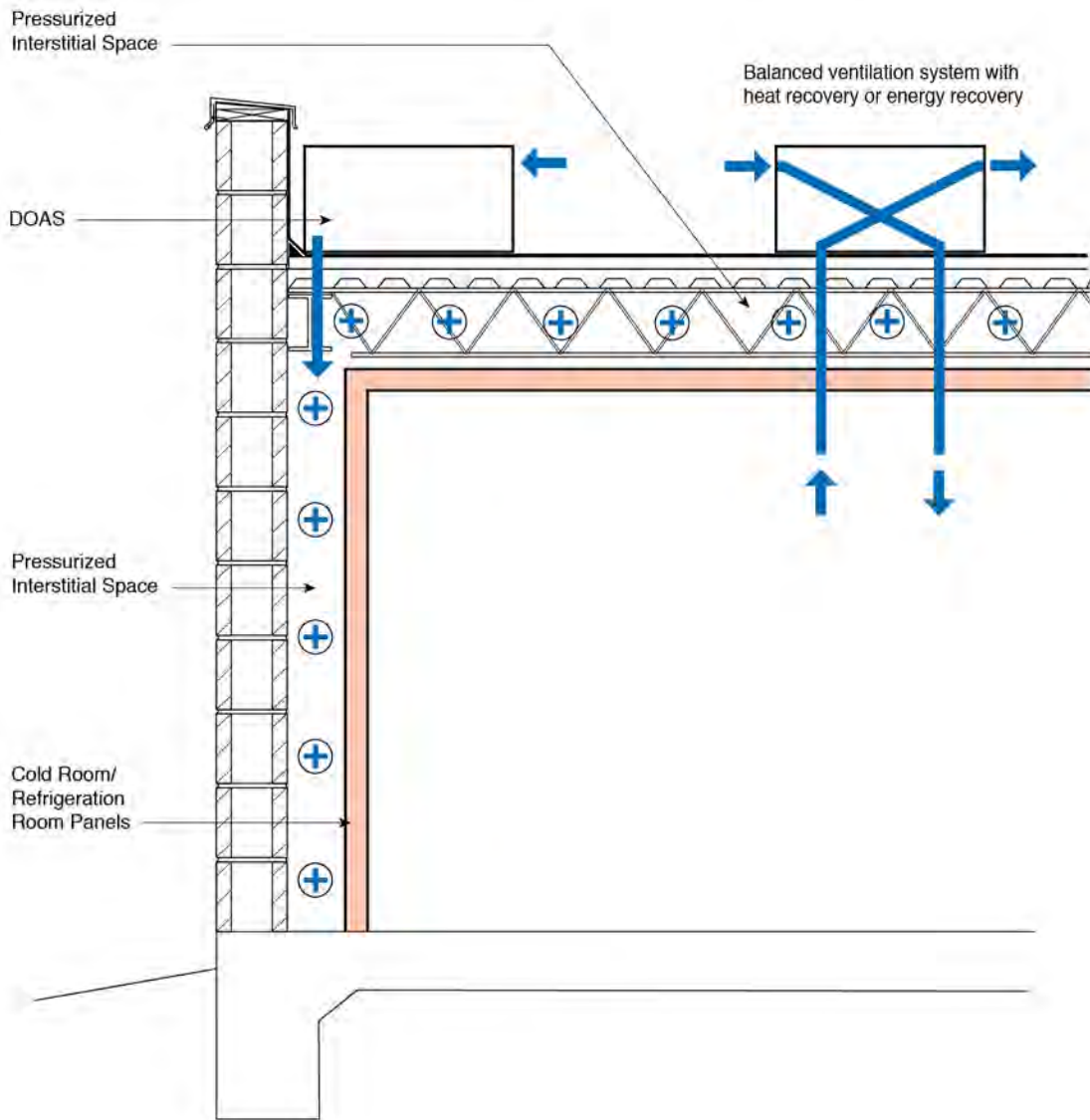


# Grow Rooms

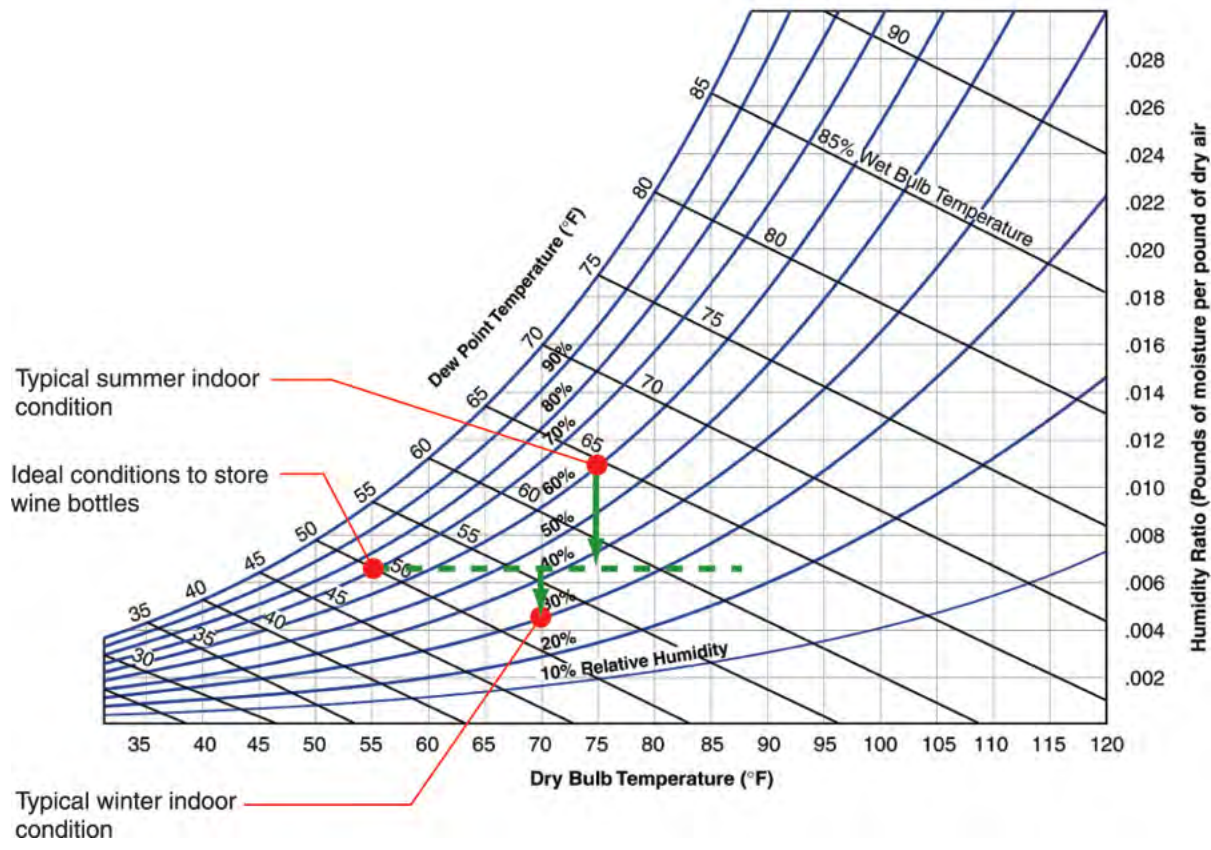








# Steam Showers





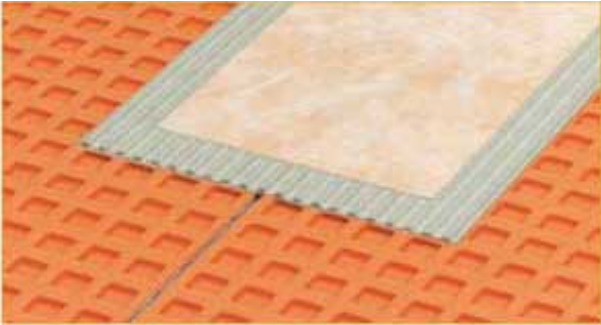


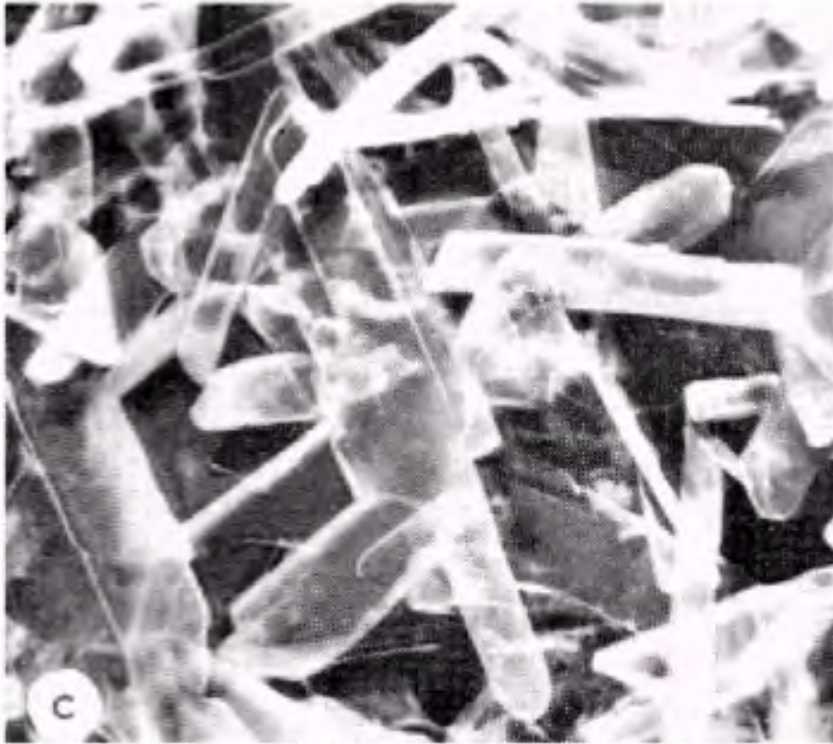




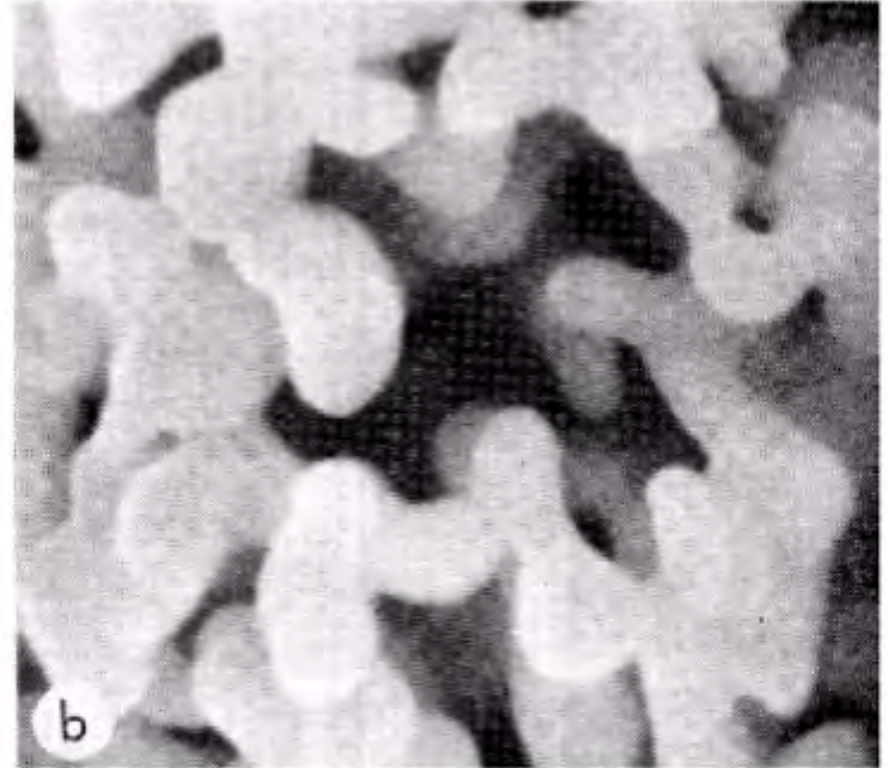








*Figure 1c. Gypsum, hydrated from plaster of paris and water, porosity 30 per cent.*



*Figure 1b. Brick, sintered clay, porosity 40 per cent.*

