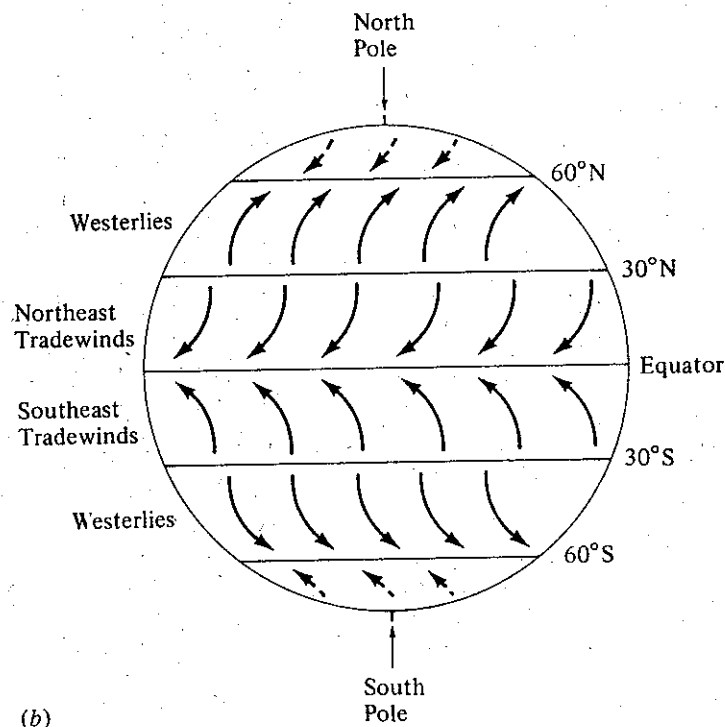


**HADLEY
CELLS**

(a)



**CORIOLIS
FORCE**

(b)

Figure 3.2 Idealized atmospheric circulation patterns. (a) Vertical profile against latitude. (b) Prevailing wind currents on the earth's surface. These belts of moving air move north and south with the seasons. Winds high in the atmosphere move in an opposite manner to those at the surface. [After MacArthur and Connell (1966), MacArthur (1972), and others.]

LATITUDINAL PATTERNS OF RAINFALL - RESULT OF HADLEY CELLS

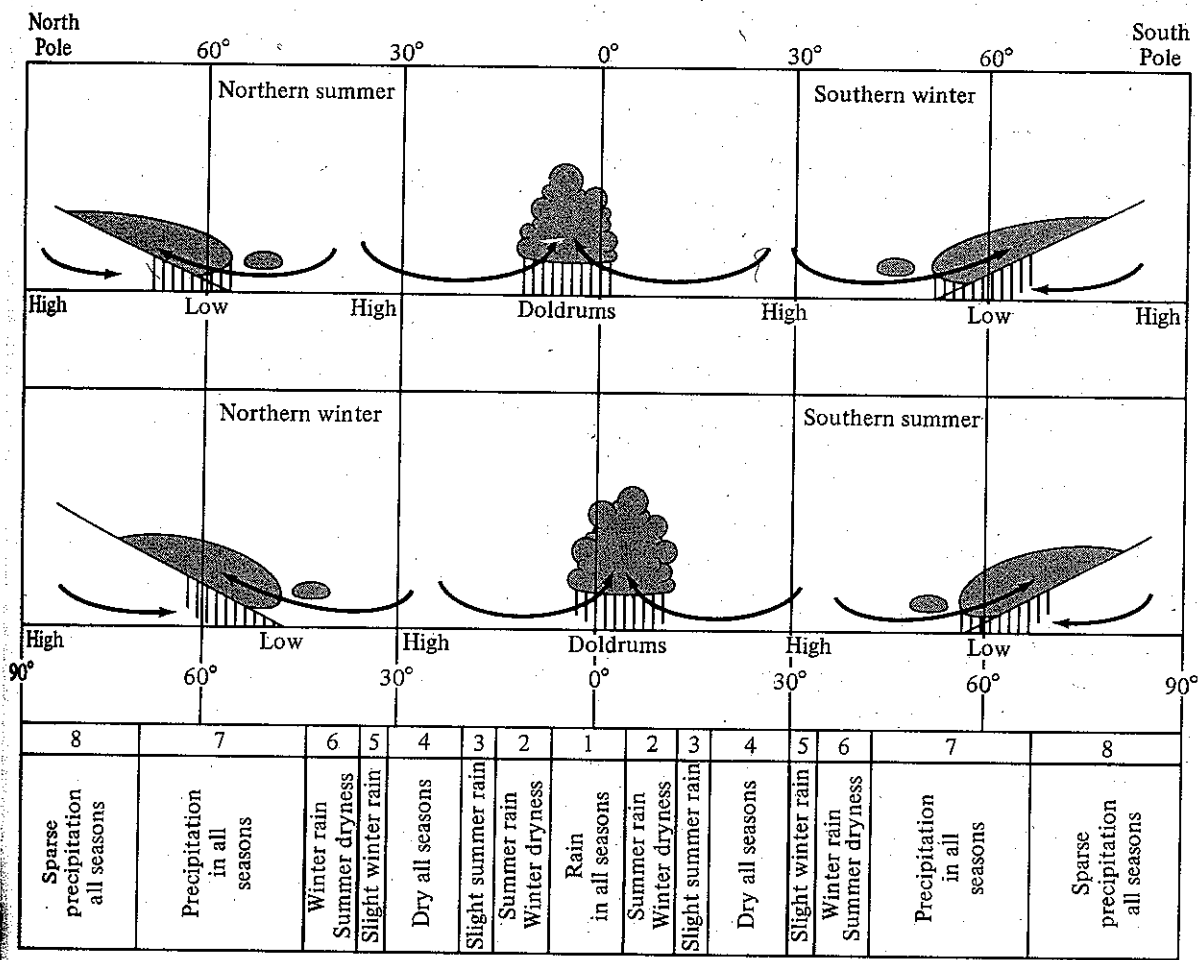
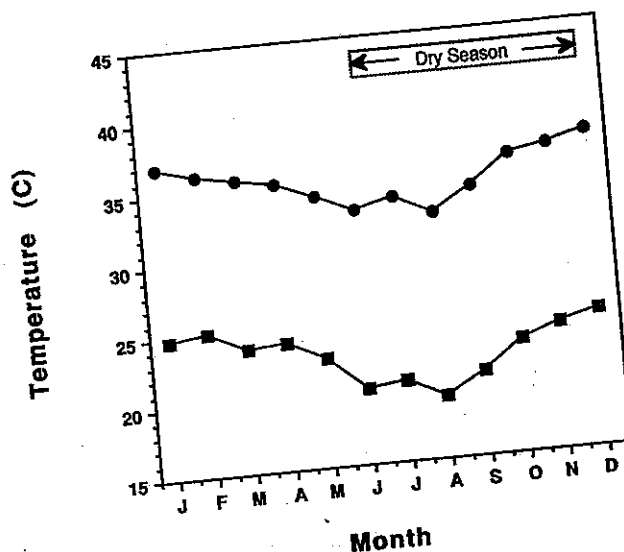


Figure 3.9 Precipitation zones vary latitudinally in a more-or-less regular fashion, as indicated. [After Haurwitz and Austin (1944).]

Seasonal variation
in a fixed
location



Selous GR
Tanzania
7° S latitude

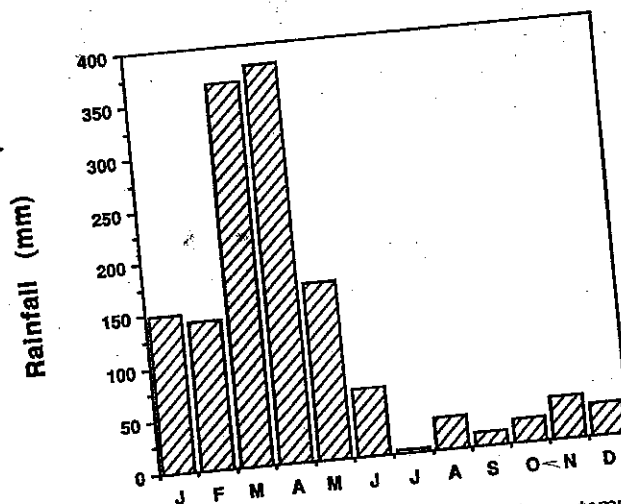


Figure 2.2 Monthly means for (a) daily minimum and daily maximum temperatures, and (b) rainfall, recorded at Matambwe, 1992–1995.

bretum in more open areas. The miombo of Selous also holds many coastal trees, particularly in riverine areas and thickets. The sparse grass layer is dominated by *Panicum infestum* (Rodgers 1979).

Miombo is maintained by fire, but miombo grades into chipya woodland in areas that are very heavily burnt. Chipya is more open than miombo, with smaller trees and dense, coarse grass. The dominant trees vary among local

GEOGRAPHIC PATTERNS OF RAIN FALL

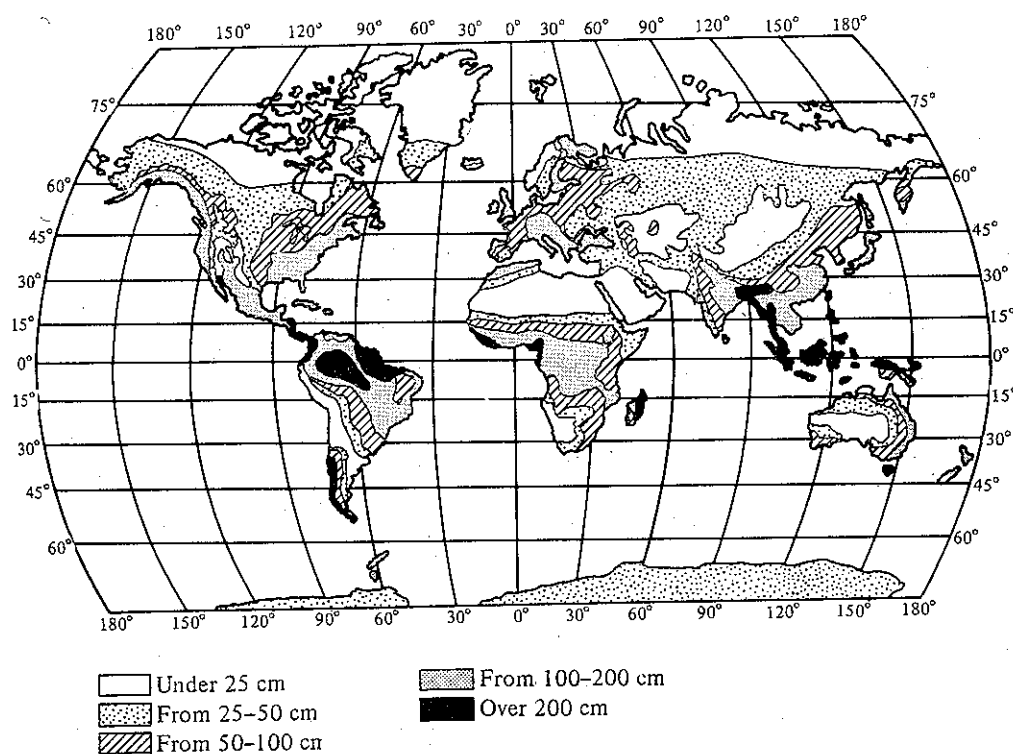
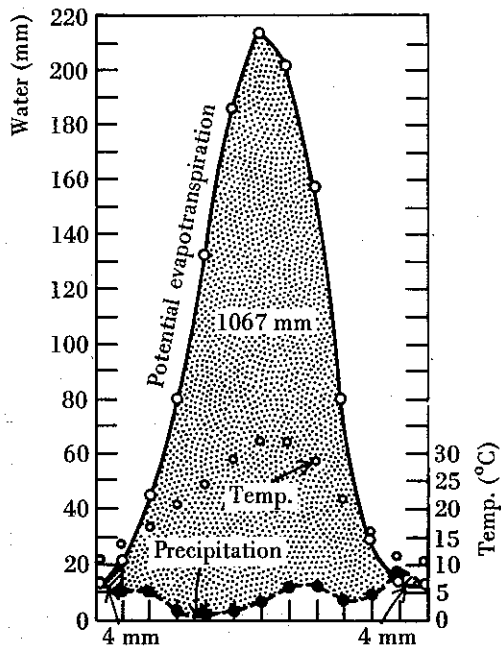


Figure 3.5 Geographic distribution of average annual precipitation. Annual world precipitation modified van der Grinten Projection. [After MacArthur and Connell (1966) after Koeppen.]

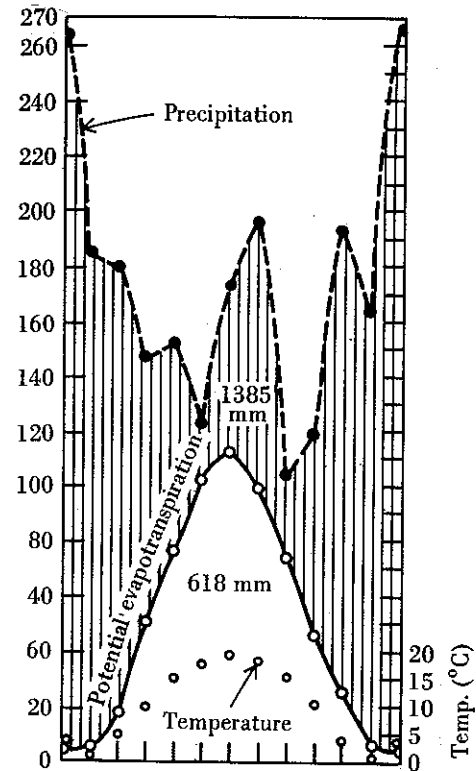
SONORAN DESERT



P.E.T. > PRECIP

SMOKY MTHS

1.4



PRECIP > P.E.T.

WATER LIMITATION WHEN
POTENTIAL EVAPOTRANSPIRATION (P.E.T.)
EXCEEDS PRECIPITATION

GEOGRAPHIC DISTRIBUTION OF CLIMATES (cf. Precipitation)

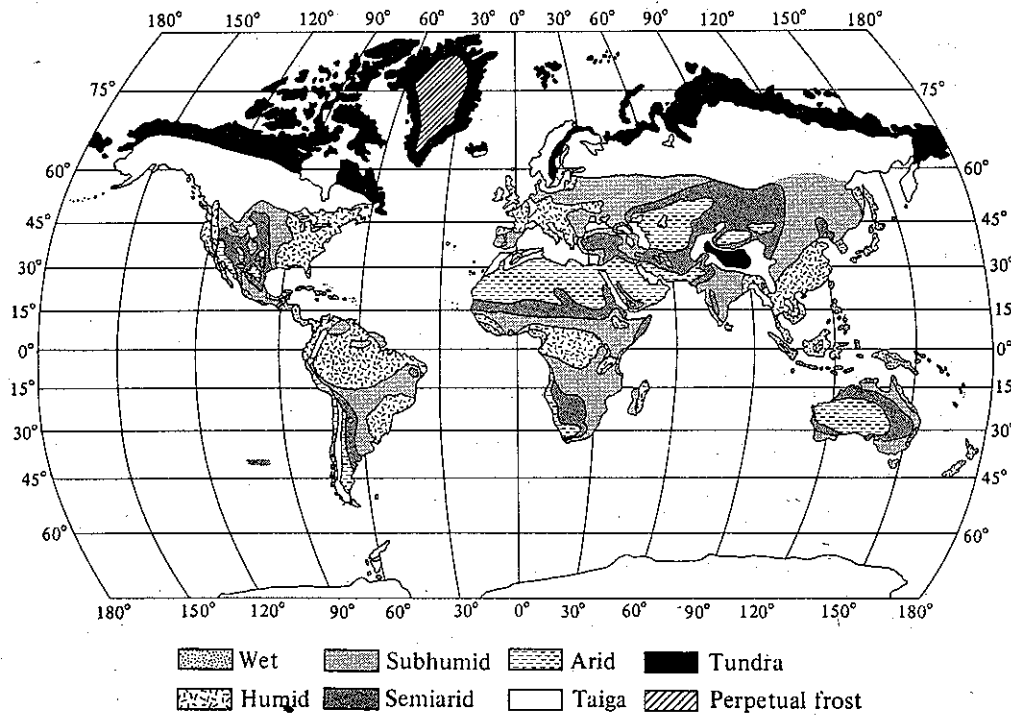


Figure 3.17 Geographic distribution of the principal climates, according to the Thornthwaite classification. [After Blumenstock and Thornthwaite (1941)]

VEGETATION COMMUNITIES CLASSIFIED BY TEMP. + PRECIP.

1.6
(a)

PRECIPITATION (cm)

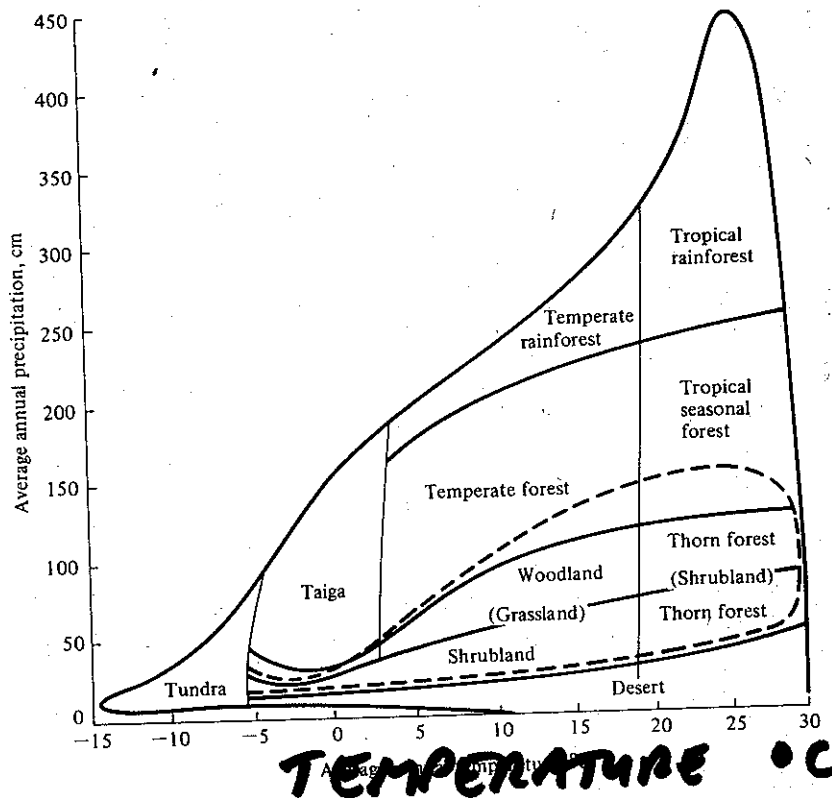


Figure 4.16 Diagrammatic representation of the correlation between climate, as reflected by average annual temperature and precipitation, and vegetational formation types. Boundaries between types are approximate and are influenced locally by soil type, seasonality of rainfall, and disturbances such as fires. The dashed line encloses a range of climates in which either grasslands or woody plants may constitute the prevailing vegetation of an area, depending on the seasonality of precipitation. Compare this figure with Figure 3.15. [After Whittaker (1970). Reprinted with permission of Macmillan Publishing Co., Inc., from *Communities and Ecosystems* by Robert H. Whittaker. Copyright © 1970 by Robert H. Whittaker.]

GEOGRAPHIC DISTRIBUTION OF VEGETATION COMMUNITIES (cf. Precip + Climate)

1.6
(6)

MICROCLIMATE 61

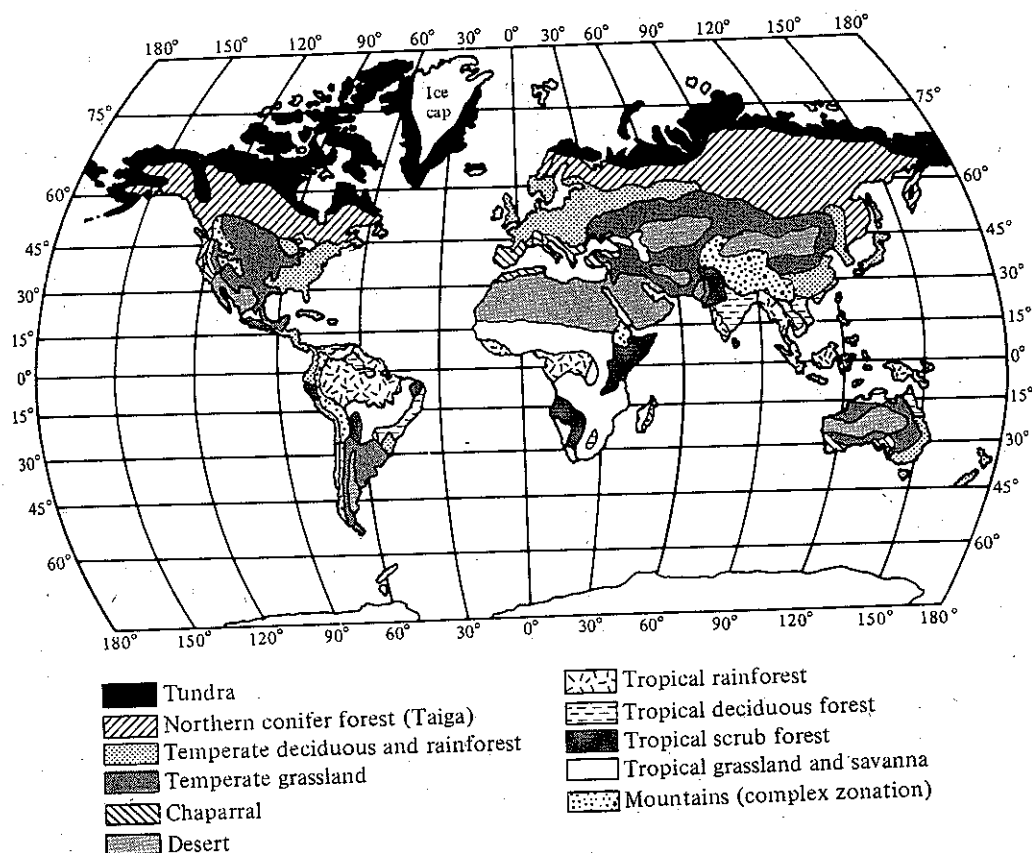


Figure 4.1 Geographic distribution of major vegetation types. [After MacArthur and Connell (1966) after Odum.]

TEST OF ACTUAL DISTRIBUTION ^{1.7} VS. EXPECTED CLIMATIC LIMITS FOR LOBLOLLY PINE

90 PART TWO THE PROBLEM OF DISTRIBUTION: POPULATIONS

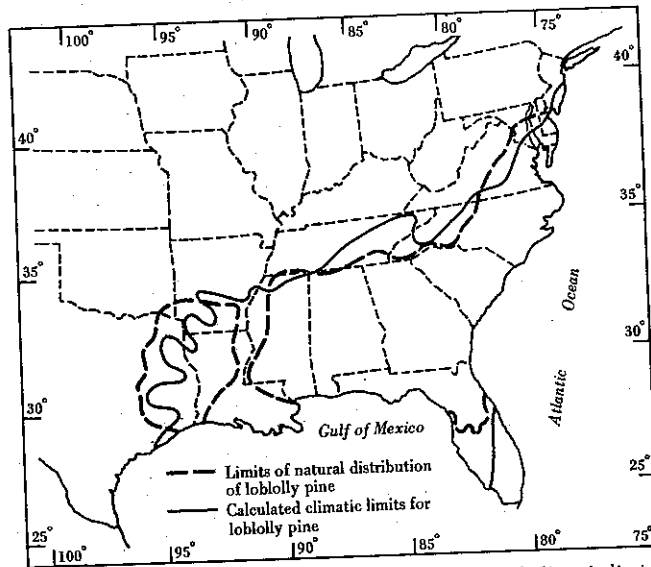
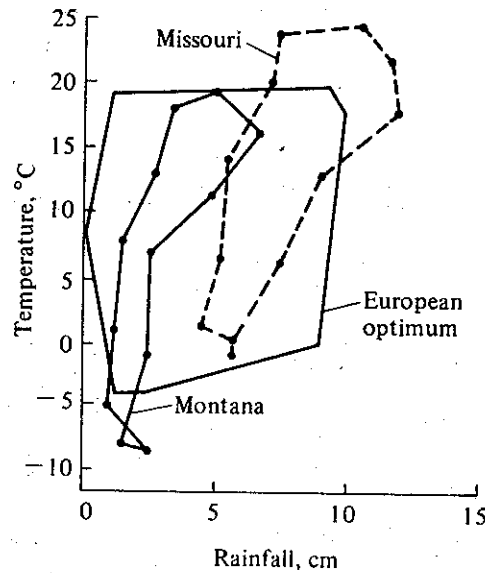
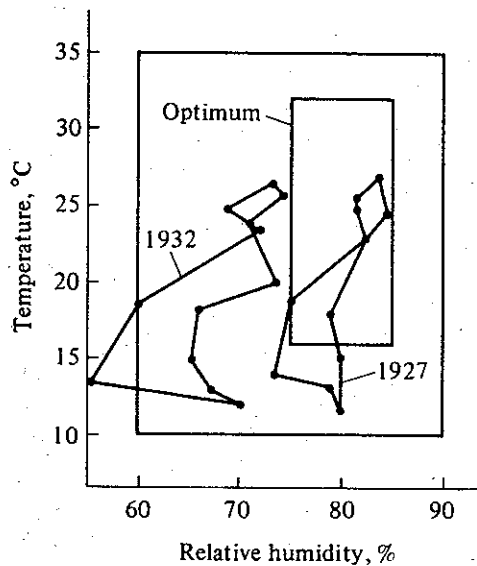


Figure 7.6 Natural distribution limits and calculated climatic limits of loblolly pine (*Pinus taeda*) in the southeastern United States. (After Hocker 1956.)

CLIMOGRAPHS OF ANIMAL DISTRIBUTIONS 1.8



PART 10GE



MED.
FLY.

Figure 3.15 Two plots of temperature against moisture. (a) Climographs for an area in Montana where the Hungarian partridge was introduced successfully and a Missouri locality where its introduction failed, compared to the average climatic conditions of its European geographic range. Apparently, Missouri summers are too hot or too wet for these birds. (b) Plots of temperature versus relative humidity in 1927 and 1932 in Israel superimposed on optimal (inner rectangle) and favorable (outer rectangle) conditions for the Mediterranean fruit fly. [Note that as drawn these rectangles assume no interaction between temperature and humidity; in actual-