

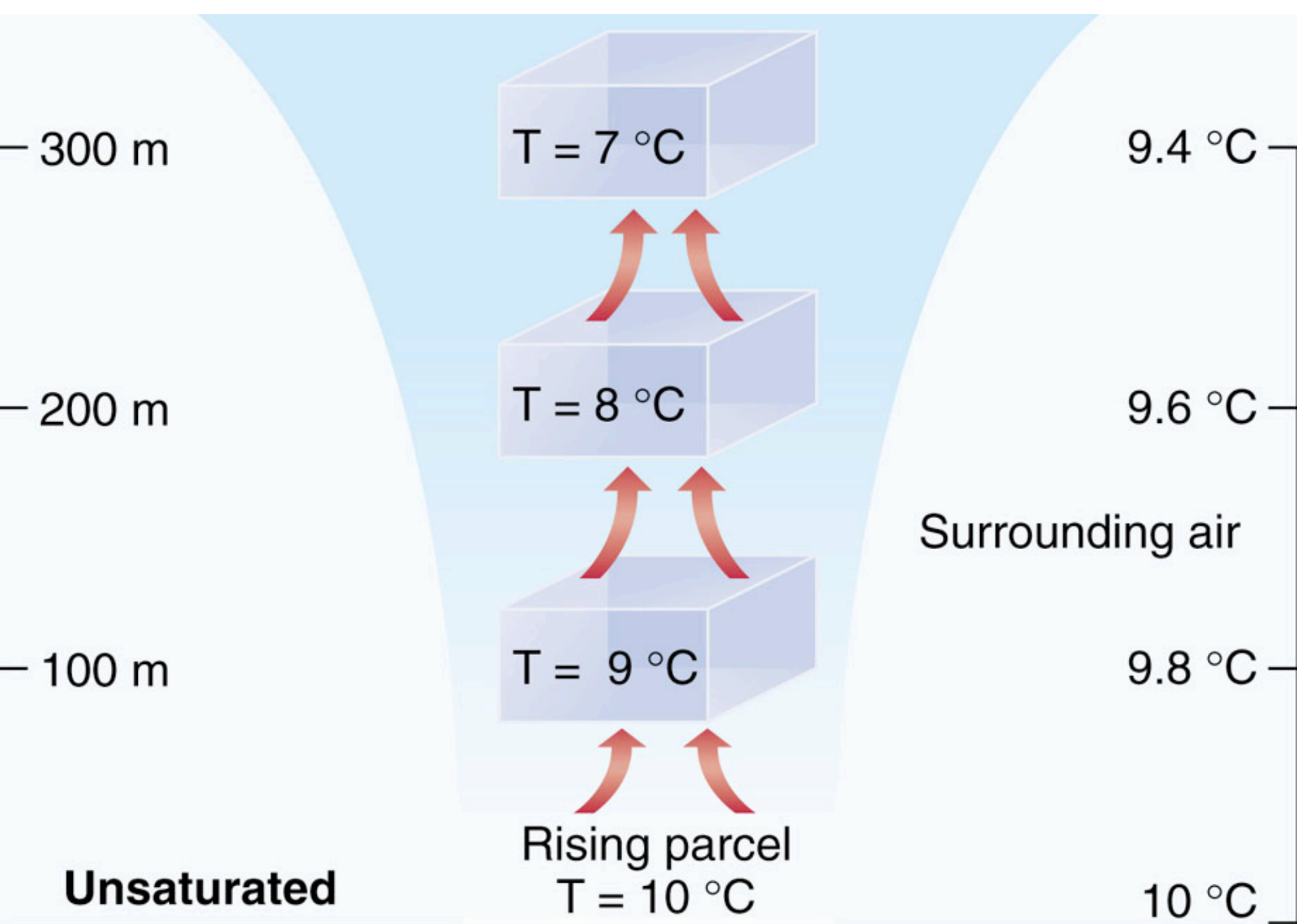
255
240
224
208
192
176
160
144
128
112
96
80
64
48
32
16
0

HURRICANE KATRINA
2:45PM CDT SUNDAY
28 AUGUST 2005

LATEST SFC PRES PER RECORD
902MB
(LOWEST SFC PRES EVER
RECORDED THIS PART OF THE GULF)







300 m

$T = 7\text{ }^{\circ}\text{C}$

$9.4\text{ }^{\circ}\text{C}$

200 m

$T = 8\text{ }^{\circ}\text{C}$

$9.6\text{ }^{\circ}\text{C}$

Surrounding air

100 m

$T = 9\text{ }^{\circ}\text{C}$

$9.8\text{ }^{\circ}\text{C}$

Unsaturated

Rising parcel
 $T = 10\text{ }^{\circ}\text{C}$

$10\text{ }^{\circ}\text{C}$

**High
Clouds**

above 20,000 feet
(6,000 meters)

cirro-stratus

cirrus

cirro-cumulus

(Made
mostly of
ice
crystals)

**Middle
Clouds**

6,500 to 20,000 feet
(2,000 to 6,000 meters)

alto-stratus

alto-cumulus

cumulo-nimbus

**Low
Clouds**

below 6,500 feet
(2,000 meters)

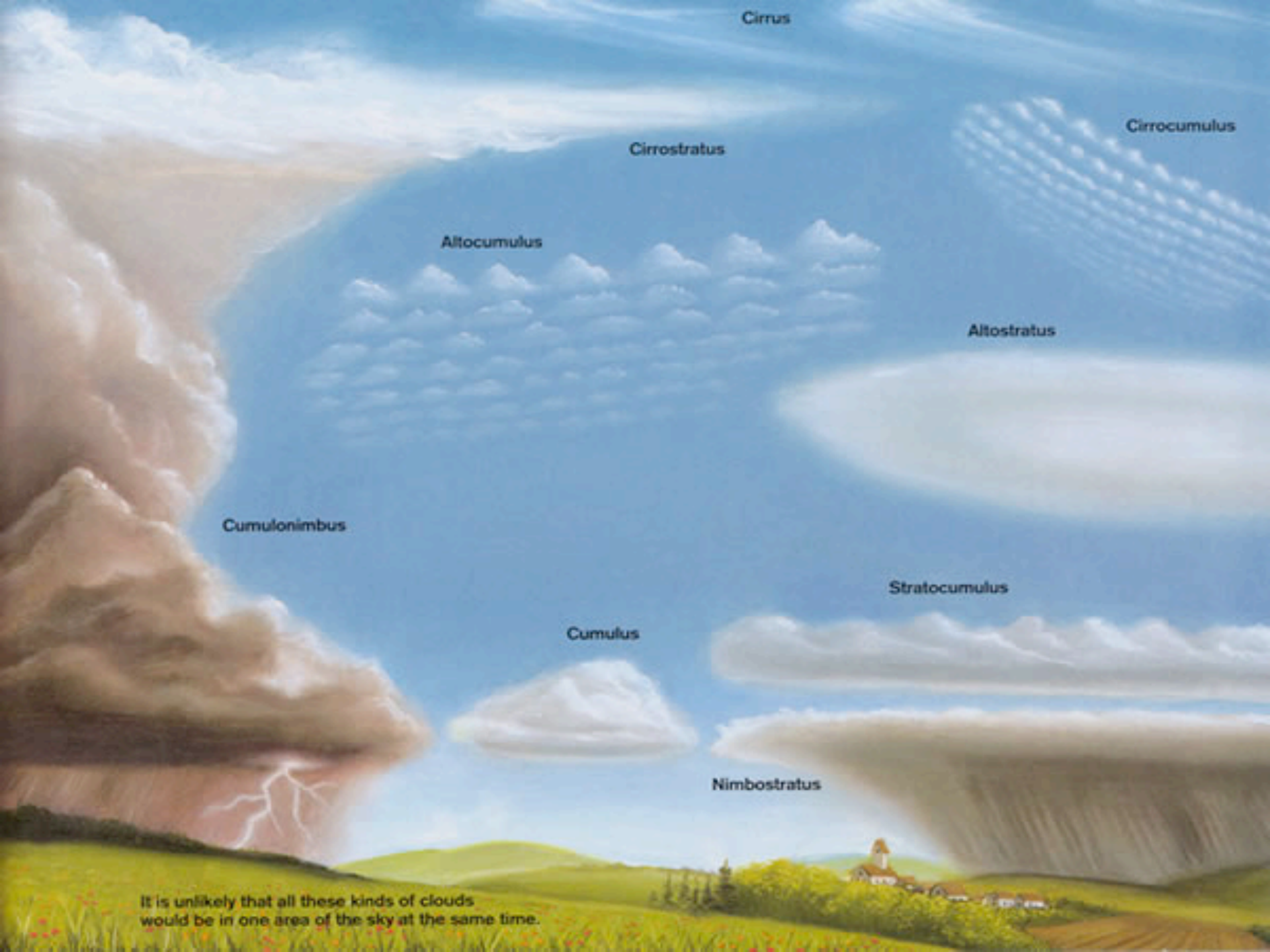
strato-cumulus

stratus

nimbo-stratus

cumulus

fog



Cirrus

Cirrocumulus

Cirrostratus

Altostratus

Altostratus

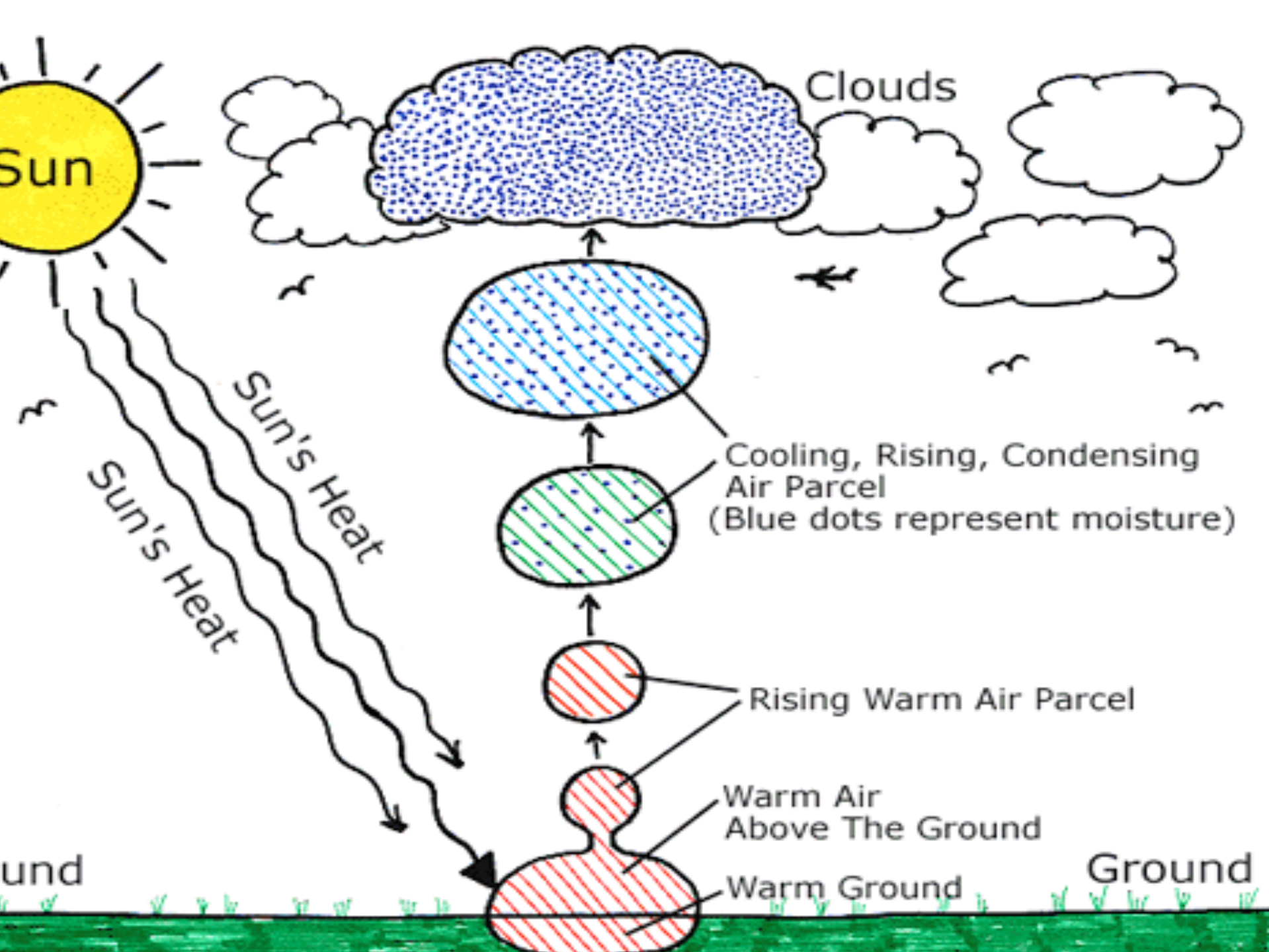
Cumulonimbus

Stratocumulus

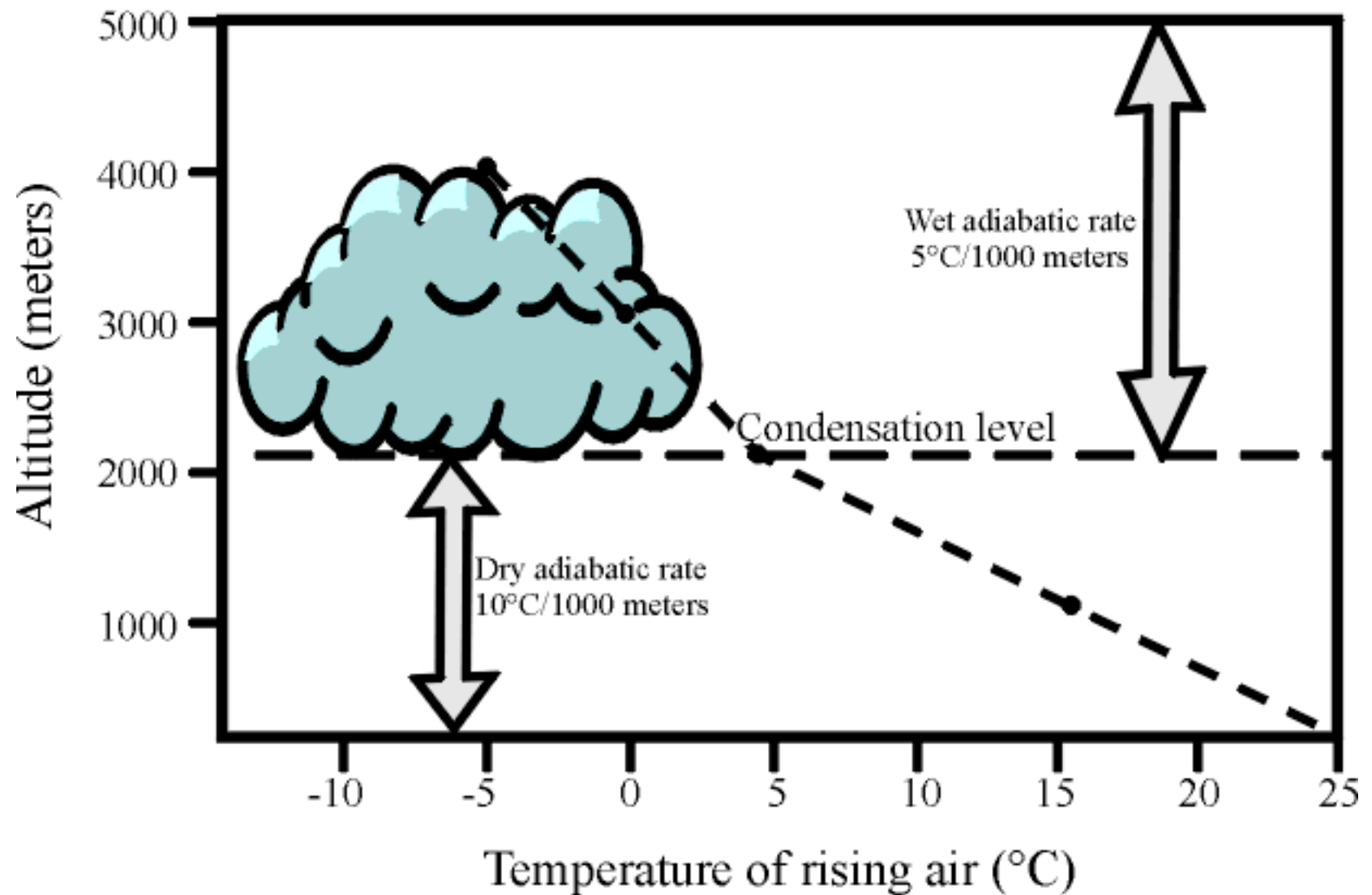
Cumulus

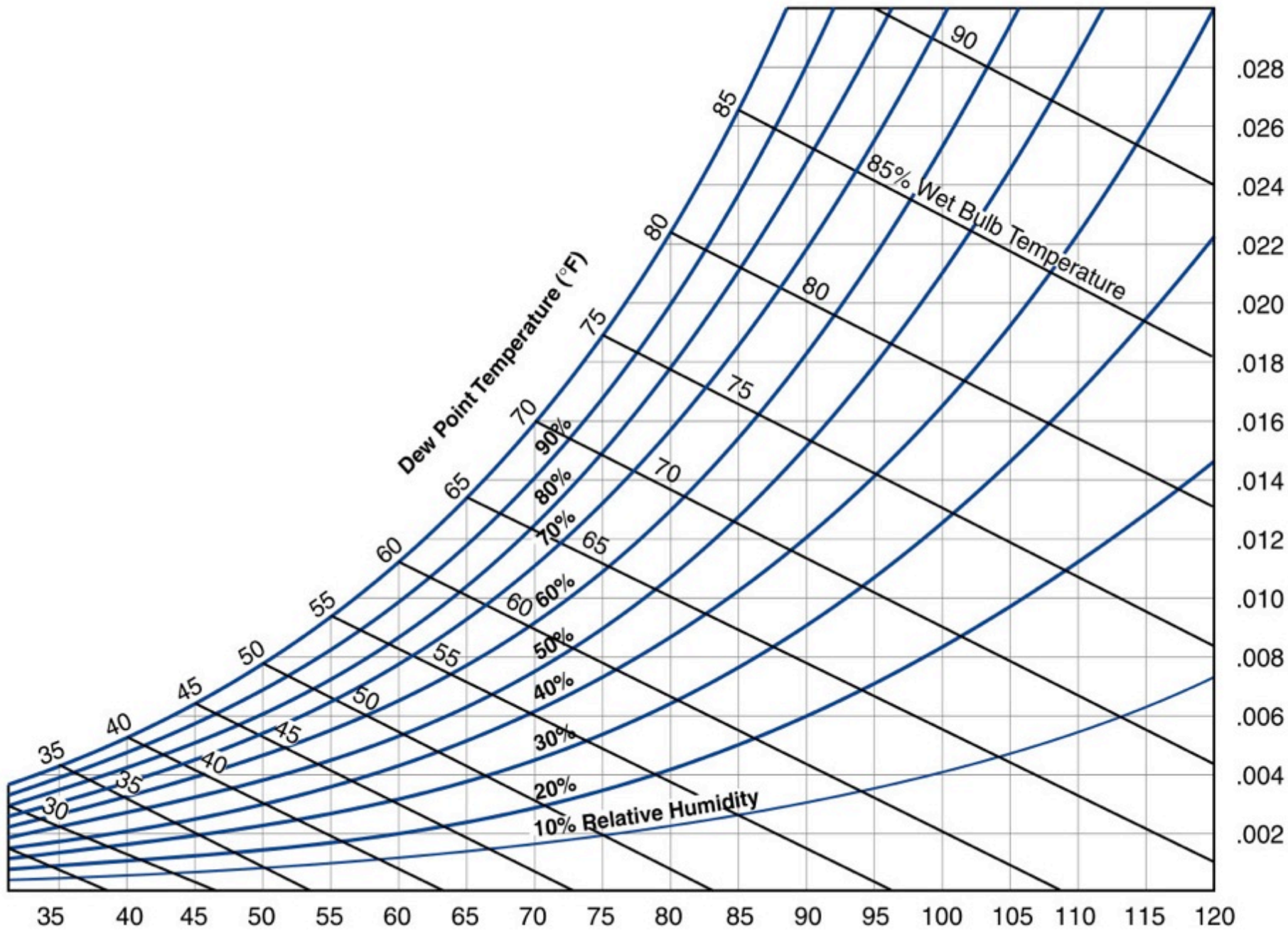
Nimbostratus

It is unlikely that all these kinds of clouds would be in one area of the sky at the same time.



Dry and Wet Adiabatic Lapse Rates





Boundary Theory

All boundaries are artificial distinctions

It's all a matter of perspective

Boundary Properties

Abrupt or gradual

Advancing, receding or fluctuating

Tolerant or destructive

Permanent or temporary

Constant-intermittent

Building Boundaries -Physical-

Roof

Walls

Doors and windows

Slabs

Foundations

Footings

Weather

Weather is a function of differences

Weather is a function of boundaries

Building weather

Outdoor weather and climate

Indoor weather and climate

In between stuff

All are in a constant state of flux

Boundary Theory

Systems have multiple edges

More components create more boundaries

Durable boundaries

effective

tolerant



Building adaptation

Building must fit in with climate

NYC weather ranges from tropical to polar

Moisture moves from wet to dry

Moisture moves from hot to cold

Water runs downhill



WALK BIKE

COMBINED
PATH

SPECIAL
DAILY
RATE
425
at Pay Box

SPECIAL
DAILY
RATE

On Hall Entry

Eastwest Parking

Eastwest Parking





Flashing details

Gravity-not just a good idea-it' s a law!

Flashing details

Drain the rain



On the plane?



Building Weather Makers

Air handlers, AC and ductwork

Moisture intrusion

Interior water leaks

Condensing surfaces

Soggy layers

Pressure differences

Operational and Occupant heat gain

Thermal comfort

Metabolic Energy - work performed = Heat

Heat loss

- Radiation

- Convection

- Respiration

 - Sensible heat

 - Latent heat

Some like it hot-some like it cold

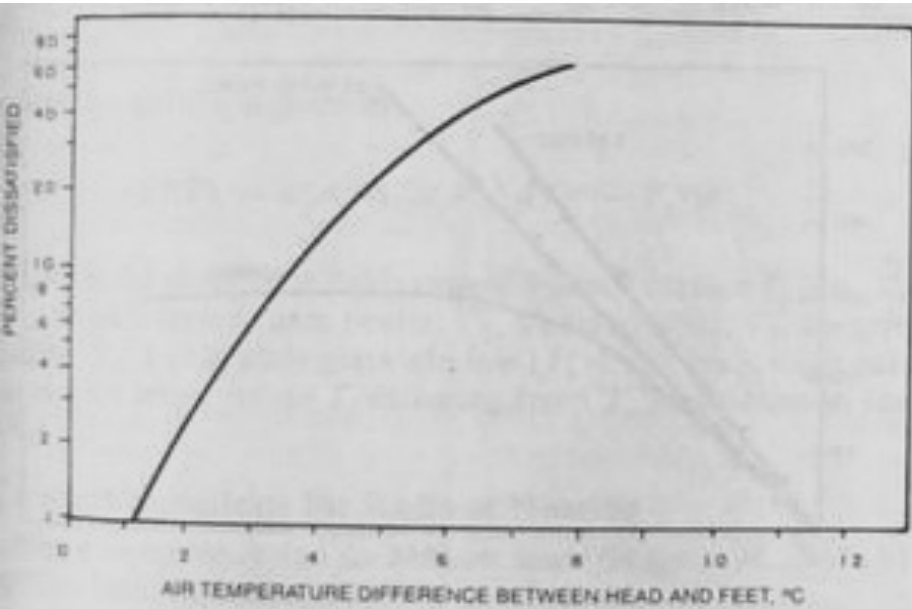


Fig. 15 Percentage of People Dissatisfied as Function of Vertical Air Temperature Difference between Head and Ankles

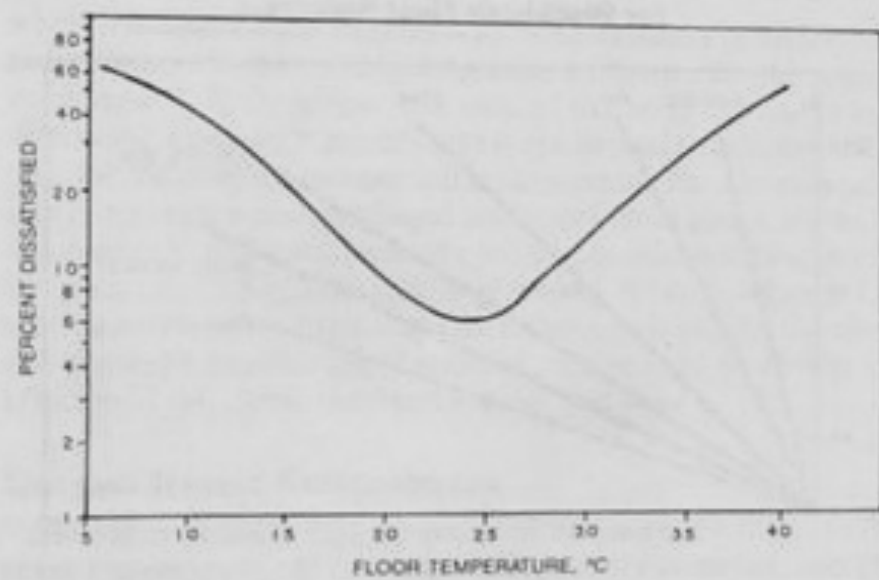


Fig. 16 Percentage of People Dissatisfied as Function of Floor Temperature

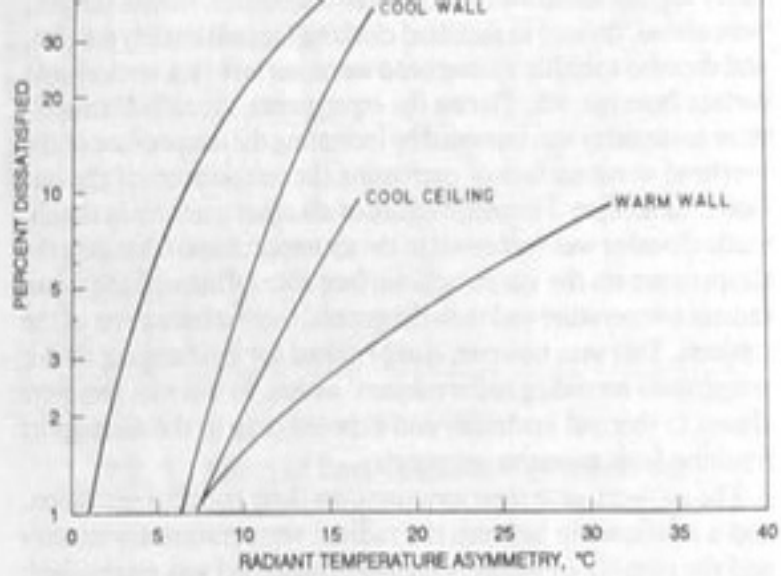


Fig. 12 Percentage of People Expressing Discomfort Due to Asymmetric Radiation

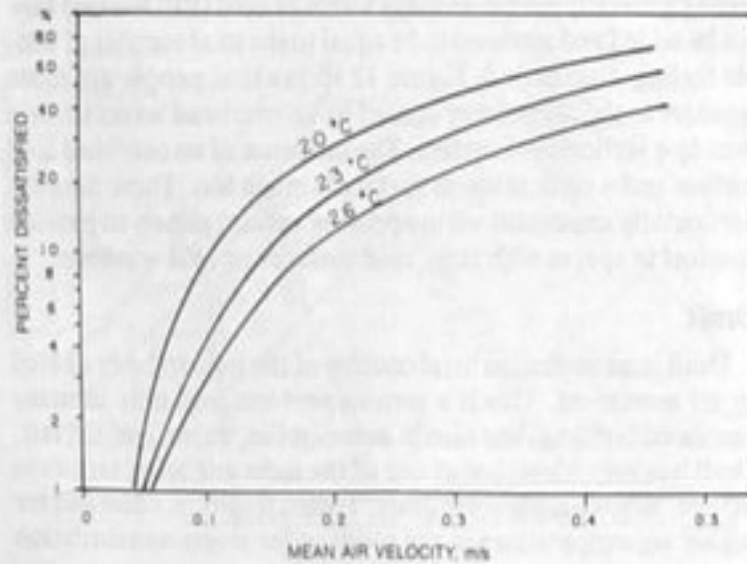


Fig. 13 Percentage of People Dissatisfied as Function of Mean Air Velocity

Thermal conditioning

Radiant heat

Conductive heat

Convective heat

Keeping your hands warm

Wool chopper liner

Good insulator prevents radiant heat loss

In Still Air

Leather or nylon outer mitt

Is an air barrier-wind proof

prevents convection heat loss

Poor adaptation to local climate
and weather
Deficient rain drainage

Leaky boots

Leaky coats

Leaky hats

Moisture intrusion

Window assemblies and other holes

Flat roofs

Ground water seepage

Hat, boots and raincoat



NO
OUTLET







