BIO120: 20161026

INTRODUCTION TO ECOLOGY

JAMES THOMSON

FIELD STUDIES, COLORADO ROCKIES

1972. LAST TIME SPENT SUMMER AND WINTER AT THE SAME PLACE

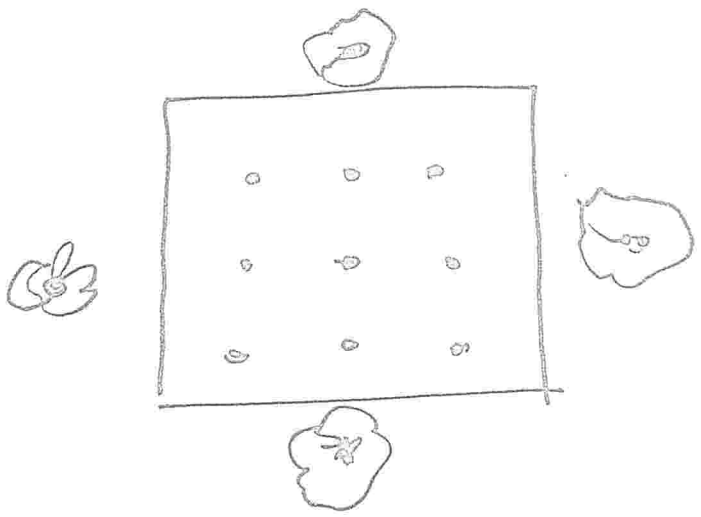
- PLANT-ANIMAL INTERACTION
- FORAGING BEHAVIOUR OF PLANT POLLINATORS

2016 RETURNED FROM DENMARK & SWEDEN ONE DAY BEFORE THE LECTURE

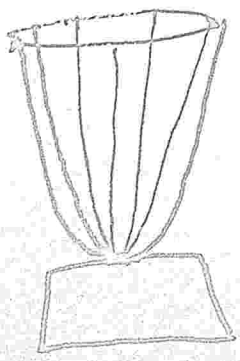
BUMBLE BEES LIKE CAFFEINÉ IN MODERATION

→ GET PERKY

→ BETTER POLLINATORS



→ REFRAME EEB TO SEX & DEATH



— MOUSE BLENDED

CELL & SYSTEMS BIOLOGY

— MOUSE UNBLENDED

ECOLOGY & EVOLUTIONARY BIOLOGY

ECOLOGY

DISTRIBUTION & ABUNDANCE OF ORGANISMS

→ MARK STROMBERG, CARRIZO PLAINS, CA

ESPECIALLY WET WINTER

→ WILDFLOWERS BLOOM

DISTRIBUTION IS PATCHY

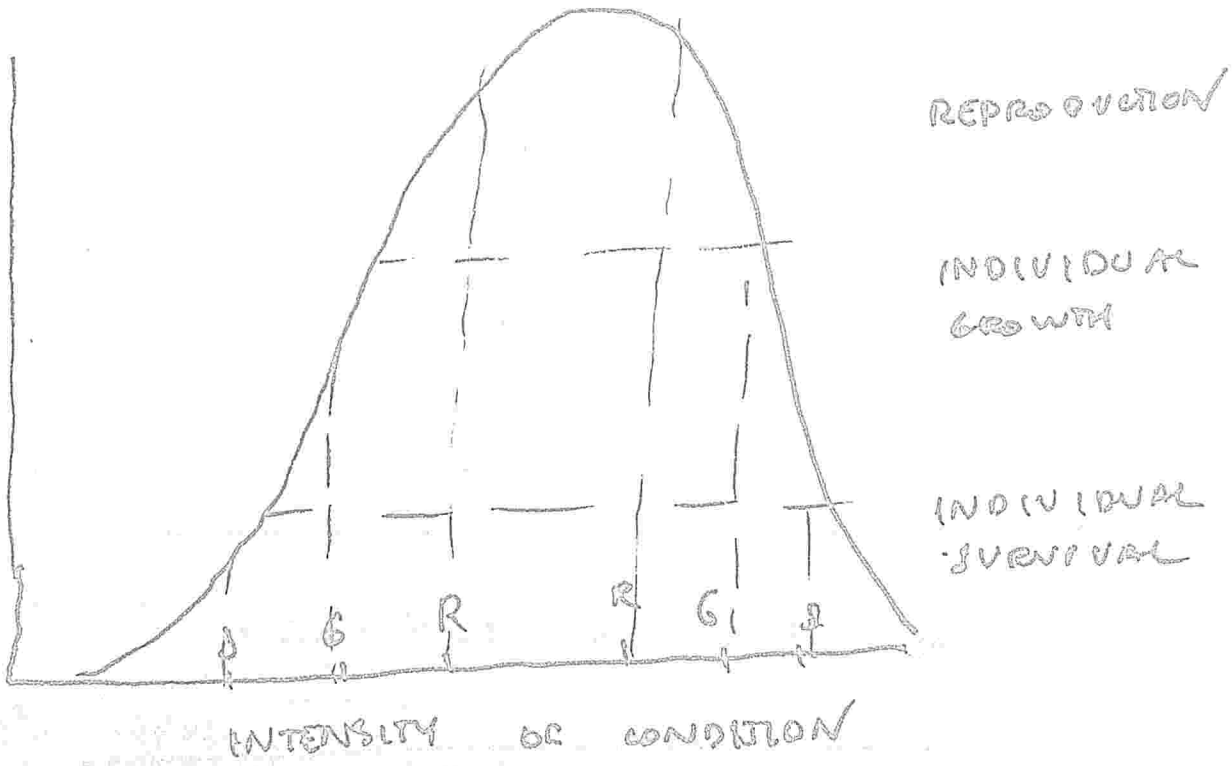
ABIOTIC FACTORS:

- EXHAUSTIBLE RESOURCES
- CONDITIONS (NOT EXHAUSTIBLE):

PRESENT IN GRADIENTS

→ ORGANISMS PERFORM BEST AT CERTAIN LEVELS

SPECIES HAVE RANGES OF TOLERANCE ALONG ENVIRONMENTAL FACTORS



GEORGE MALLORY

- COLD TEMPERATURE
- LOW OXYGEN LEVEL

MOST IMPORTANT FACTORS

- FOR TERRESTRIAL PLANTS
  - TEMPERATURE
  - SOIL MOISTURE
  - NUTRIENTS
  - DISTURBANCE
  - HERBIVORY, DISEASE, POLLINATORS, SEED DISPERSERS, MYCORRHIZAL FUNGI
- FOR AQUATIC PLANTS:
  - ADD SALINITY, REMOVE MOISTURE & FIRE

- FOR TERRESTRIAL ANIMALS
  - FOOD & WATER
  - TEMPERATURE
  - HABITAT QUALITY
  - PREDATION, DISEASE
- FOR AQUATIC ANIMALS;
  - + SALINITY / OSMOTIC PRESSURE

GRADIENTS

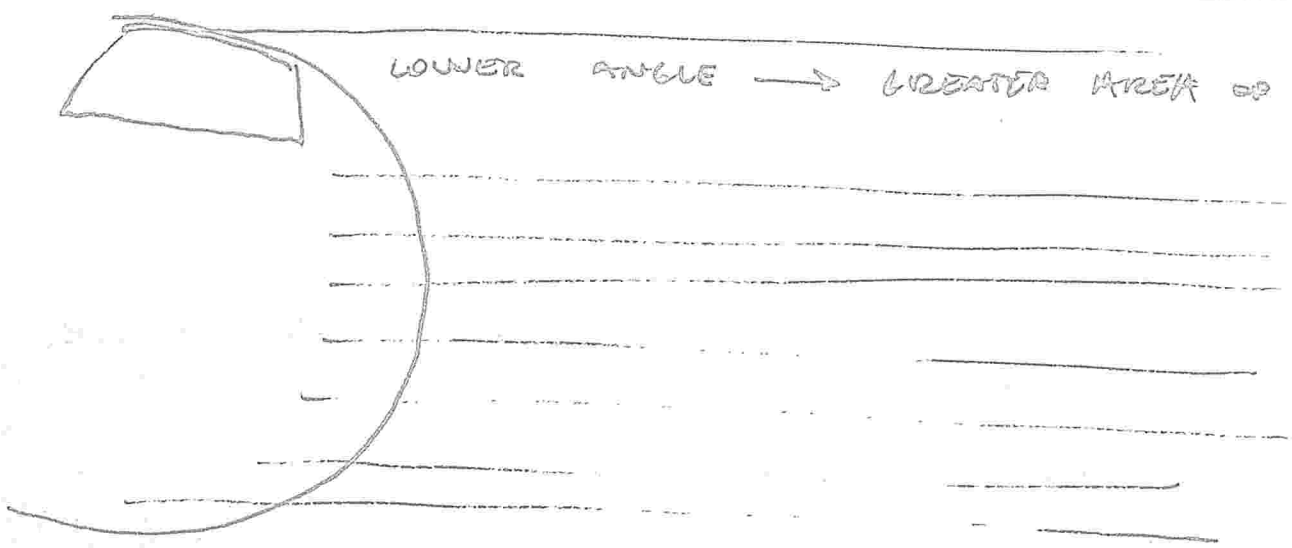
TEMPERATURE

- MOSTLY A FUNCTION OF LATITUDE

RAINFALL

SEASONALITY

- MOSTLY A FUNCTION OF TEMPERATURE AND RAINFALL



DIFFERENTIAL HEATING DRIVES THE EARTH'S ATMOSPHERIC HEAT ENGINE

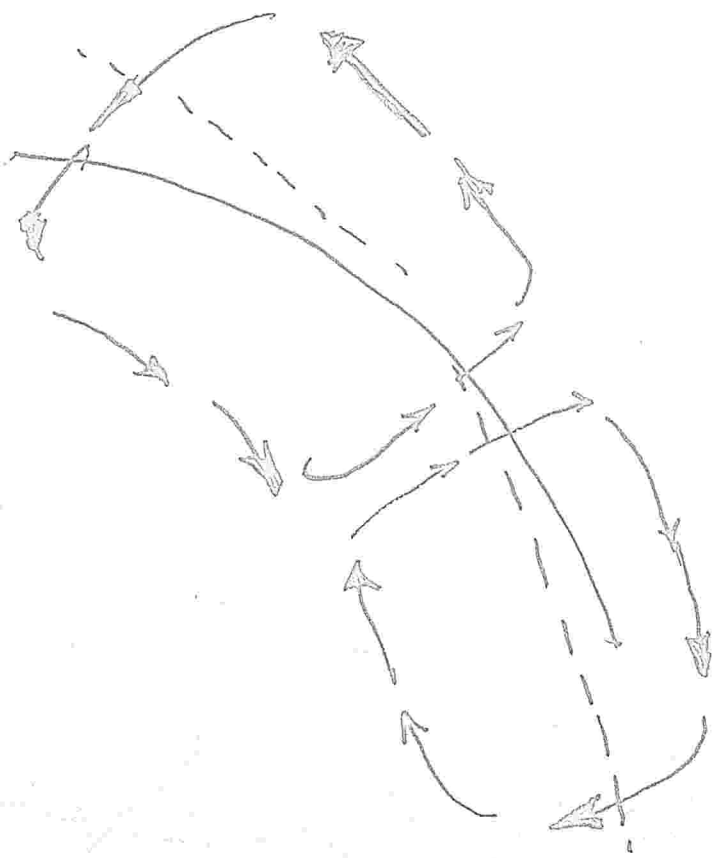
ATMOSPHERIC CIRCULATION:

- HADLEY CELLS MAKE EQUATORIAL REGIONS RAINY

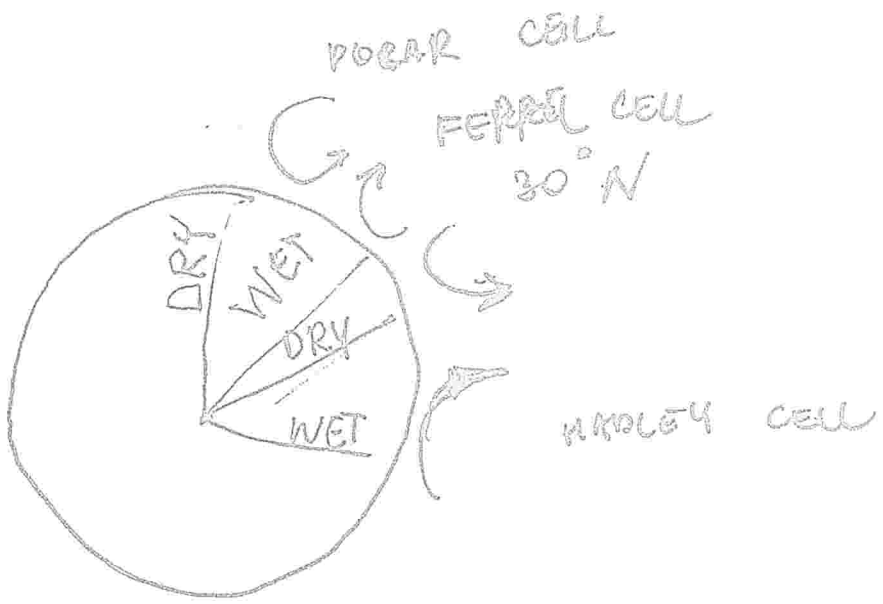
- AIR COOLS AS IT RISES:
  GOVERNED BY LAPSE ERROR: 5 - 10 C/1KM

- AS AIR RISES, AIR GETS COLDER AND VAPOUR CONDENSES

- AS AIR TRAVELS, IT WARMS UP



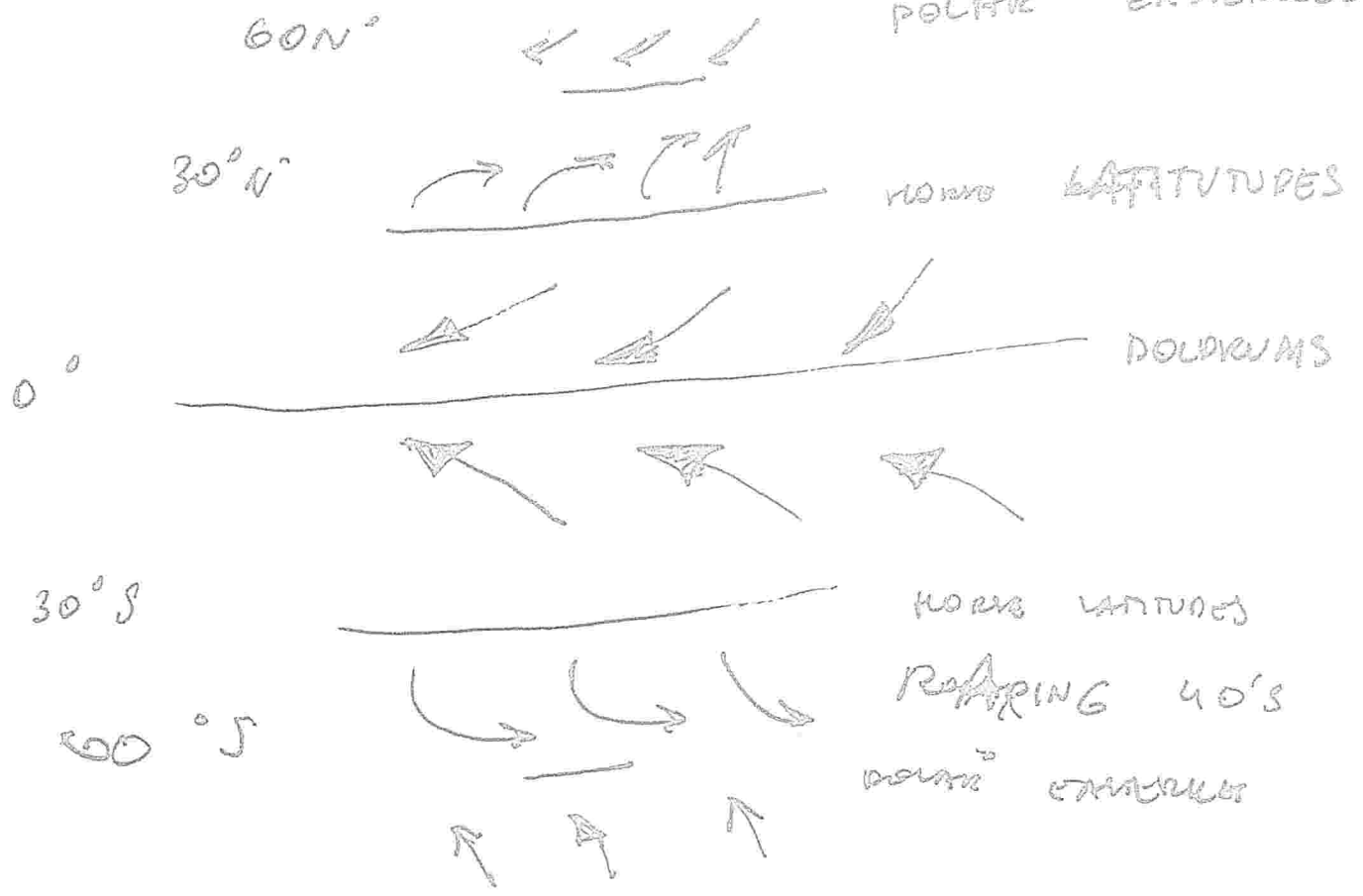
ATMOSPHERIC CELLS INTERLOCK LIKE A GEAR TRAIN



INTERTROPICAL CONVERGENCE ZONE

ITCZ SHIFTS SEASONALLY, PRODUCING RAINY AND DRY SEASONS IN SOME PARTS OF THE TROPICS

COUPLED CELLS + CORIOLIS CELLS



WANDERING ALBATROSS

DIOMEDEA EXSULANS

- LARGEST WINGSPAN (3.5m)
- 22:1 GLIDE RATIO
- FORAGING TRIPS
  AVERAGE 10 DAYS
  UP TO 3600 KM
- GLOBAL CIRCUMNAVIGATOR
- ADAPTED TO THE ROARING 40'S