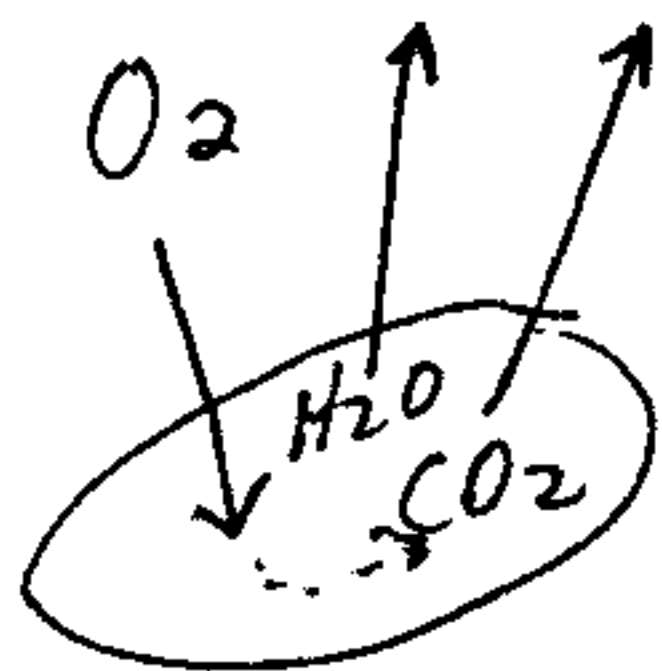


7/30/91

Dr. Cindy Carey: O₂ Exchange in Avian Embryos at High Altitudes

- eggs differ in yolk content: precocial eggs tend to have higher yolk (and \therefore higher fat) contents



CO₂ important ^{for} pH
H₂O important for moisture
O₂ needed for 1st breath

- factors available to maternal control

- ① pore area
- ② pore #
- ③ ventilation

- eggs use roughly same % of H₂O throughout species
 \therefore eggs will absorb roughly same % of gas

- chicks use air for first breath prior to cracking egg

As altitude increases, diffusion coefficient ^{increases} ~~decreases~~, which will help in part cope w/ decr. in ambient O₂ but will also increase loss of CO₂ & H₂O.

Is there a consistency in
return of animals to
high altitudes

To maximize O_2 uptake

- ① Δ area, pore #, ventilation
- ② increase PO_2
- ③ increase blood O_2 capacity

To minimize H_2O O_2 loss

- ① decrease area, pore #, ventilation
- ② dec. ΔP_{H_2O} ΔP_{O_2}
- ③ incr. H_2O & buffer capacity

Conclusion

Birds modify diffusion -- decrease it
but O_2 intake decreases.

But what happens at higher altitudes