

## HOMEOSTASIS

### Relative concentrations of ions in sea water and body fluids.

	<u>Na</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>Cl</u>
Modern Ocean	100	3.6	3.9	12.0	181
Primitive Ocean	100	6.7	3.1	0.7	--
Human Serum	100	6.7	3.1	0.7	129
Dog Serum	100	6.6	2.8	0.7	140
Range for body fluids of organisms	100	3.7-9.5	2.7-4.8	0.7-2.4	130-170

(Orig: A. E. Harper, after Macallum. 1926. Physiol. Rev. 6, 316.)

### Conditions that made the primitive ocean an environment favorable for the development and survival of living organisms.

- Relatively constant composition (vast bulk)
- Relatively constant temperature (high specific heat)
- No violent disturbances (high viscosity)
  - except in shallow water
- High concentration of salts
- Constant osmotic pressure
- Constant pH
- Adequate substances in solution
- Waste removal (near infinite dilution)

### Physiological "constants" for humans.

	<u>Median</u>	<u>Range</u>	<u>Variation</u>
Serum albumin (g/100 ml)	4.6	4.0-5.2	13%
Calcium, serum (mg/100 ml)	10	9-11	10
CO <sub>2</sub> tension, serum (mm Hg)	39	38-40	3
Chlorides, serum, as Cl (mg/100 ml)	366	355-376	3
Glucose, fasting, blood (mg/100 ml)	90	70-110	22
Sodium, serum (meq/l)	140	137-143	2
Potassium, serum (meq/l)	4.5	4-5	11
RBC'S, blood, (10 <sup>6</sup> /mm <sup>3</sup> )	4.9	4.2-5.5	14
Blood pressure, average, arterial, systemic (mm Hg)	125	110-140	13

(Orig: A. E. Harper, from Cecil and Loeb. 1960. A Textbook of Medicine. Saunders.)