

EX. 11.1 (Combustion)

- One pound of carbon, when burned in oxygen, gives off enough heat to raise 80.9 lbs of water by  $100^{\circ}\text{C}$ .
- How much carbon must be burned to raise the temperature of a litre of water by  $10^{\circ}\text{F}$ ?
- 1 litre of  $\text{H}_2\text{O}$  weighs 2.2 lbs
- 10 deg. Fahr is  $\frac{5}{9} \times 10 = 5.6^{\circ}\text{C}$  (temp. change)
- 0.056 lbs of carbon will raise 80.9 lbs of water by  $5.6^{\circ}\text{C}$
- 0.0015 lbs carbon will be required to raise 2.2 lbs water by  $5.6^{\circ}\text{C}$
- 0.0015 lbs is also 0.021 oz. or 0.68 grams
- How high might combustion of 0.0015 lbs carbon lift one litre of  $\text{H}_2\text{O}$ ? Well, 1 gram falling 425 m can heat 1g  $\text{H}_2\text{O}$  by  $1^{\circ}\text{C}$ . And 0.0015 lbs carbon can heat 1 litre  $\text{H}_2\text{O}$  by  $5.6^{\circ}\text{C}$ . So it could heat 1g  $\text{H}_2\text{O}$  by  $5600^{\circ}\text{C}$ . which could lift 1g  $\text{H}_2\text{O}$  by  
$$425 \times 5600 = 2380 \text{ km}$$
or one litre of  $\text{H}_2\text{O}$  by 2380 meters.