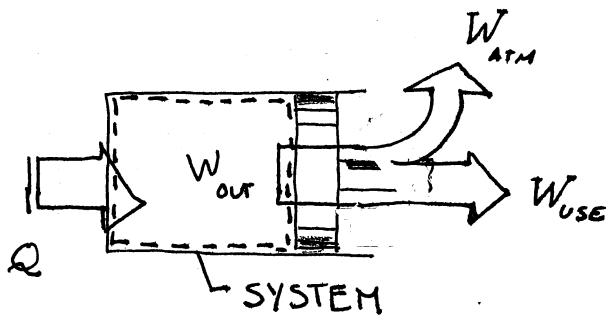


WHAT IS THE MAXIMUM AMOUNT of USEFUL WORK OUT of A CLOSED SYSTEM AS IT GOES TO EQUILIBRIUM w/ THE ENVIRONMENT, EXCHANGING HEAT ONLY WITH THE ENVIRONMENT?



ENVIRONMENT T_0, P_0

STATE (1) T_1, P_1

STATE (2) $T_2 = T_0$
 $P_2 = P_0$

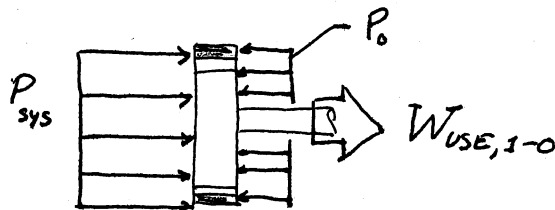
FROM LAST TIME:

$$\dot{W}_{OUT} =$$

NEED FINITE TIME

$$W_{1 \rightarrow 0} =$$

NOT ALL WORK IS USEFUL. SOME IS WORK DONE THE ATMOSPHERE:



$$W_{ATM} = \int$$

$$\therefore W_{ATM} =$$

SO

$$W_{1-0, MAX} =$$

=

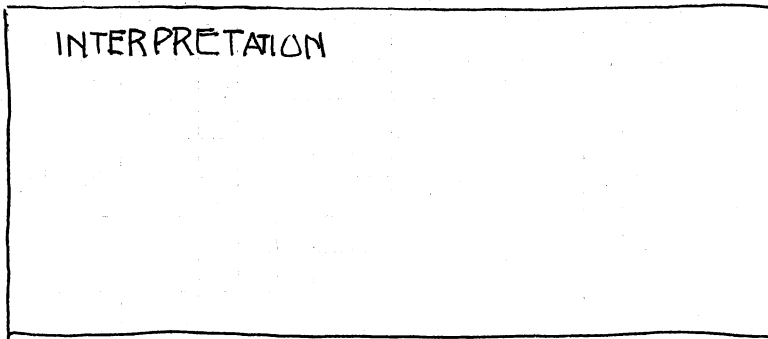
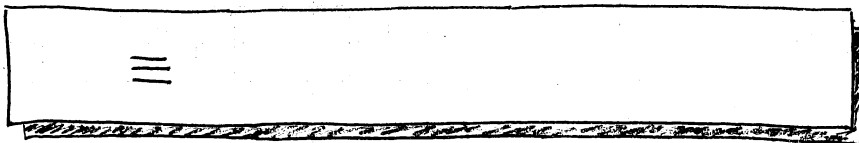
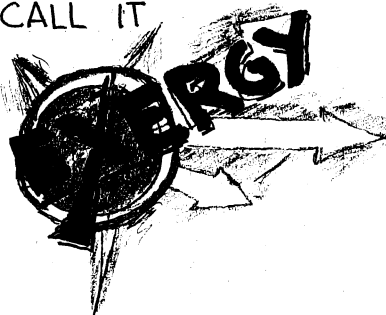


↑
HOLY MACARONI

Holy Macaroni! THAT'S A _____!

~

LET'S CALL IT



U_0
 S_0
 V_0 }

PROPERTIES of _____
EVALUATED @ T_0, P_0

REARRANGING

$$\underbrace{\frac{d}{dt}(A_{\text{sys}})} = \underbrace{\sum_{i=1}^n \left(1 - \frac{T_0}{T_i}\right) \dot{Q}_i}_{\quad} - \underbrace{\dot{W}_{\text{OUT,USE}}}_{\quad} + \underbrace{\sum_{\text{IN}} \dot{m}(a_f) - \sum_{\text{OUT}} \dot{m} a_f}_{\quad}$$

$$- T_0 \dot{S}_{\text{gen}} \quad \}$$

THE