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ENTROPIA DEMOCRATIA

DEMOCRACY THERMODYNAMICS



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# I O A N N I S M E L A N I T I S ENTROPIA DEMOCRATIA

## DEMOCRACY THERMODYNAMICS

Entropia Democratia is a measure of the *number of ways* in which a public assembly might be arranged. Pnyx etymologically derives from *pyknos*=dense; density may be a mathematical cantilever for conceptualizing oratory. Subsequently, the dispersion of the different modes of recruitment of a rhetorical speech can be divided and number-ised in terms of thermodynamics. Equivalently to classical thermodynamics, entropia might be evaluated as a measure of disorder, or a measure of progressing towards thermodynamic equilibrium. In a society, a stable order, as an equilibrium in *ideas*, is annulling. Ideas can affect citizens and be formalised as a measurable experimental quantity, but the by-product of their political induction is often inestimable. Distribution of participants in an assembly may take infinite values if the speech causes massive disorder. If assemblies act as closed systems, meaning incapable of exchanging energy with exterior space, their conditional states are deterministically moving towards a death equilibrium. Though, the entropy of an isolated system never decreases, because isolated systems through internal processes spontaneously evolve towards symmetry. Probability distributions of body politic may be calculated.

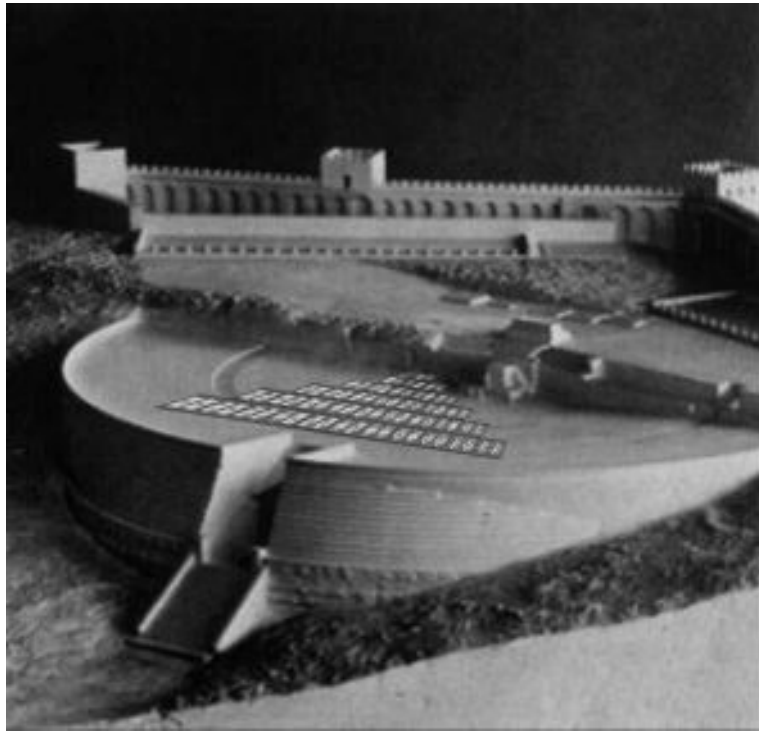


image courtesy: <http://oed.oup.com/ajl/glossary/democracy/democrac2.htm>

*A diagram of Pnyx's multiplicity assembly with probability distributions*

Entropy (Εντροπία) can be considered as a measure of a political speech multiplicity. In the public body grid (κόμβος), every citizen may acquire six double states, as in a pair of dice: (1) acquiescence, (2) discord, (3) doubt, (4) reassessment, (5) consensus, (6) ambivalence, like a dice that provides

a diakyveuma (*διακύβευμα*) which we might define as **R**ception. As the speech continues, the orator gets information from the assembly and proceeds. Note here that in the system orator-assembly, we have the same properties for the orator as well as in every member of the audience constituting together a pair of dice option:

(1) : 1-1 and 1-1,

(2): 2-1 and 1-2,

(3): 3-1 and 1-3,

(4): 4-1 and 1-4,

(5): 5-1 and 1-5,

(6): 6-1 and 1-6

... in the same way with other combinations, we have in total  $6 \times 6 = 36$

microstates while the number of macrostates is 11. The equation might be:

Entropy of Public Speech =  $k \log \text{Multiplicity}$  where  $k=1.38062 \times 10^{-23} \text{ J/K}$ , so

$$\text{Entropy of Public Speech} = 1.38062 \times 10^{-23} \text{ J/K} \log \text{Multiplicity of Reception}$$

As democracy expands approaching equilibrium, its multiplicity (entropy) tends to increase. Simultaneously, homogenization in society tends to formulate a balance that threatens democracy itself. Absolute homogenous groups turn all its members to numbers, in a way that predictability behavior tends to maximize. Reverse-ly, heterogeneity inflation disintegrates every possible confluence between agents. Every member is in a battle between two tendencies: the minimal potential energy (unequivocal conceptual consensus ) and maximal multiplicity (political chaos). Several issues analysed by the speaker act like microstates of an hypothetical system, like a gas in a box where individual particles move from disorder to equilibrium. The assembly exists in an entropic container regulated by political asymmetries.

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