Entropy of real pendulum

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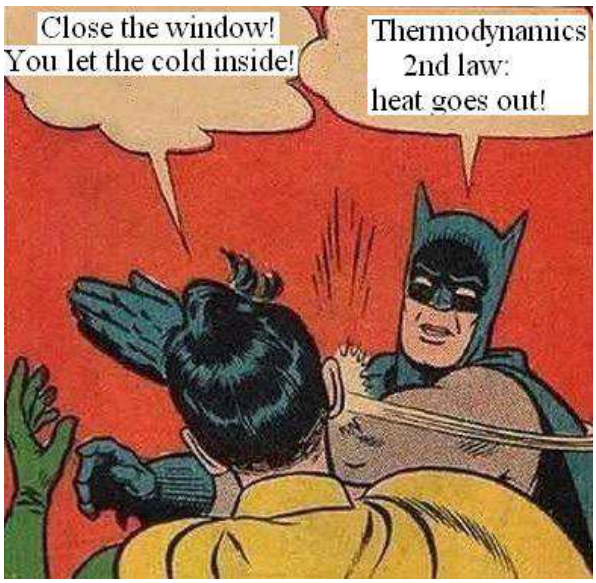
(Dated: November 6, 2013)

Mustiness basement of Science were blown up, in time of rising Einstein. He has not taken any of the Newtonian principles (three dimensional World with absolute time) into General Relativity. The beam of starlight passing in Sun's low gravity, showed, that even in weak field limit the General Relativity empirically contradicts the Newton's theory. Nowadays the Science is slow. I propose to critically examine its foundations once again. Because there are experiences, which contradict the Science. And the entropy, as it not being sold on market, is mystical enough.

PACS numbers: 65.40.gd, 67.30.ef, 05.70.Ln, 05.10.-a

The proud Science is often unnecessarily detached from real, simple thinking.



Task: a spring pendulum attached to a stone in deep space. The losses on radiation are neglectable. Firsts state, time t_1: pendulum started to work, temperature is T_1 everywere. Second state: dissipation caused pendulum to stop, but there is (and was) temperature gradient. Third state, time t_2: termodynamical equilibrium, i.e. all parts of pendulum and stone are of the same temperature T_2. Needed: to describe quantitatively the system in respect of entropy.

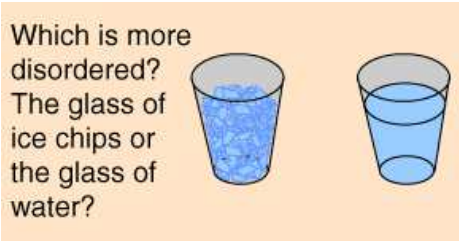
Entropy in thermodynamics is simply $dS = dQ/T$. So, defined is only change dS, but not the S itself. Therefore, the knowing the T_1 one can not know the initial entropy, same for T_2. Finding the ΔS is problematic: system was not working in thermal equilibrium, so the $T = T(x, y, z)$ and the integration using $dS = dQ/T$ is impossible. Is needed Non-equilibrium thermodynamics, but what is it?

The entropy is more or less abstract parameter in a mathematical theory, trying to approximately describe experiment. In thermodynamics the growth in entropy is linked to decrease of "free energy", ability to work. But take glass with water and drop a drop of paint there. In all process of diffusion one can not extract work, so the free energy remains zero. How define something, that is increasing with time? It is average volume of paint. So one can name it "entropy". But they go on microlevel. What are they doing there?

Entropy in Statistical Physics (see Landau's book [1]). One uses highhandedness, saying "the phaze space volume, where system spends most of the time". But God is patient enough to spent almost eternity, looking on pendulum. Thus, this is very relative and not scientifically objective enough. O.K. Say, that we shall record positions of pendulum's atoms during one week. It is impossible: the $t_2 - t_1$ is five minutes. But recording positions during less than some minutes, will not give much time for exploration of all possible states in phase space. If You take a snapshot, an instant of the system at time t_2, well, it will fill zero volume in the phase space $\Phi = \Delta p \Delta x$. Because in Landau's book one uses (non working) classical mechanics to get trajectory of the system. On the other hand, Landau uses "elementary cell" in phase space $\epsilon_x \epsilon_p = h^2$ and gets number of states by division $N = \Phi/h^2 = (\Delta p/h)(\Delta x/h)$. But the shape of elementary cell depends on precision of measuring: if precision $\epsilon_x = l_p$, then from uncertainty principle $\epsilon_p = h/(4\pi\epsilon_x)$. Therefore, the correct formula shall be $N = (\Delta p/\epsilon_p)(\Delta x/\epsilon_x) = (\Delta p/h)(\Delta x)(4\pi) = 4\pi\Phi/h$. The obvious highhandedness is to consider trajectory of system in phase space: if one later uses Quantum Physics (the h^2), then one shall use it from begining and there are no trajectories in Quantum System. Otherwise we get semiclassical theory, which is "not fish nor meat". Just to get coincidents with experiment, which not always happens: [2]. Unscientific arbitrariness is also the size of ϵ_x, the "Integral" has challenged "Physics beyond Einstein" [3], so made me believe, that there is no minimum possible size.

But what will say Non-equilibrium thermodynamics? It assumes, that small parts of system (subsystems) are about in thermodynamical equilibrium (same temperature everywhere). They say, that many, but not all

systems are such. The $T = T(x,t)$, in such system, each subsystem has not small Poynting vector, thus, not small spatial gradient of temperature dT/dx. Moreover, if there is strong conductivity, the temporal gradient of temperature (after stopping of pendulum) is strong in all subsystems dT/dt. And this gradients are not dependent on size of subsystems. In conclusion, current Non-equilibrium thermodynamics is the next approximation towards EMPIRICAL reality, after the ordinary Thermodynamics.



Saying, that [4], there are more ways to arrange moleculas in right glass, is implies the process of arrangement. So having not seen the process on this picture, one shall be silent about "disorder". Suppose the ice was droped into glass, the particular configuration has zero probability (as the ice chips can form infinite configurations). The water, however (have been poured into glass) on macro level has the same configuration, however on molecular level there are infinite possibilities. The infinite entropy? But where is the previous state of water, where is the process?

In conclusion: the entropy, if is linked to not true theories, is also not true. As the Newton's Gravity is not true.

[1] L.D. Landau, E.M. Lifshitz, Statistical Physics, Pergamon Press 1969.

[2] Some problems with Quantum Electrodynamics, e.g., the contradiction in size of proton http://science.compulenta.ru/733235; the Cosmic ray paradox; the behaviour of magnetic dipoles on nanoscale (Zabel et al., Phys. Rev. Lett.); the behaviour of electrons while collisions with other particles http://science.compulenta.ru/724531.

[3] Google: "Integral challenges physics beyond Einstein" on Phys. Rev. D 83:121301, arXiv:1106.1068v1. No "space foam", see the arXiv:1211.3816v1.

[4] "Entropy as Time's Arrow" http://hyperphysics.phy-astr.gsu.edu/hbase/therm/entrop.html