

A novel physical effect of Maxwell's demon type stopping of molecules and the production of clean inexhaustible energy

Simon Berkovich*

Professor Emeritus, The George Washington University
Washington DC berkov@gwu.edu

In the time of crisis philosophy becomes an applied science V.S. Stepin

Abstract

The paper presents a novel method for generation of free clean energy using a novel physical effect: a Maxwell's demon type extraction of moving molecules in the Cellular Automaton Universe. The suggested device might be able to produce some extra amounts of liquid nitrogen by replenishing this cryogenic fuel. The availability of this clean energy can be virtually unlimited.

What is energy?

Any physics textbook will tell that energy is "the capacity to do work-a certain entity to be transferred to an object in order to get the work done. Yet, according to Richard Feynman: "It is important to realize that in physics today we have no knowledge of what energy is". Energy appears in different forms in physical, chemical, and biological processes and is evaluated by the effects it creates. The conservation law states energy cannot come from nowhere, nor disappear into nothingness: the total amount of energy in co-measurable terms remains constant. In effect, a sarcastic depiction of this law: "Energy is never created nor destroyed, it simply goes from one formula to another' presents an ironic truth. Actually, none of the fundamental scientific theories in its intrinsic suppositions traces the origin of energy. In all theoretical constructions transformations that ought to be associated with energy are simply taken for granted. A cellular automaton construction is a grid of nodes whose states are transformed in discrete steps depending on the states of the surrounding neighbors. Our Cellular Automaton (CA) model of the Physical Universe is briefly described in our mini review [1]. Various information on this model called CAETERIS (CA EThER InfraStructure) can be conveniently accessed through the indicated review by clicking on the corresponding references inside [1].

The considered type of a CA infrastructure is indispensable for Life as it incorporates the functionality of living matter [2]. Besides that, this model exclusively introduces the concept of energy, as an entity, which is required to execute CA activities necessary to produce material constituents. The latest energy modifications are presented in our recent work [3]. With these obtained results we can derive by exactly the same methodology both fundamental energy formulas: Plank's $E = h\nu$ and Einstein's $E=mc^2$ (please, consider slides 10 -15).

On the Perpetum Mobile of the Second Kind

Perpetual motion machine of the second kind is a machine which produces work from a single heat source. According to the second law of thermodynamics this is impossible [4] and this law of thermodynamics applies regardless of the size of the system. Thus, the motions and rotations of celestial bodies such as planets may appear perpetual, but are actually subject to many processes that slowly dissipate their kinetic energy, such as solar wind, interstellar medium resistance, gravitational radiation Thus, machines that extract energy from finite sources will not operate indefinitely, because they are driven by the energy stored in the source, which will eventually be exhausted. But in the CAETERIS model the ultimate source of energy in the Universe drives the formation of matter itself, so it will be wearing out only with the Apocalypse. The point is that the cellular automaton energy is difficult to extract.



***Corresponding author:** Simon Berkovich, Professor Emeritus, Washington DC, USA

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This can be done by dragging macromolecules or stressing tectonic plates. As a result, that is how an inexplicable operational energy appears in foremost biological and geophysical objects [5]. Notably, this way biological organisms becomes Perpetum mobile of second

kind; as discovered in [6]), humans do not burn food calories to get energy for their motions. The food is taken not for energy but for the purpose of maintenance-as negentropy [7].

Free Inexhaustible Energy by Replenishing Liquid Nitrogen (RLN)

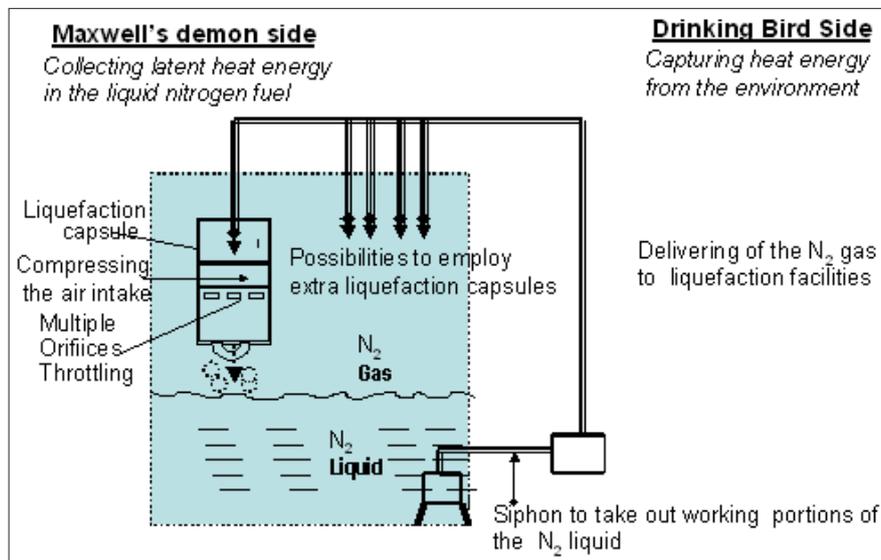


Figure 1: A schematic diagram for Replenishing Liquid Nitrogen-RLN device.

A schematic diagram of the RLN device is presented in Figure 1. This contraption utilizes another way of extracting the intrinsic Cellular Automaton energy, and thus constitutes a particular Perpetum mobile of the second kind. First, the LNR device directly extracts heat energy from the environment, as the famous toy "Drinking Bird" [8]. The LNR device on this side operates essentially on the latent energy from the vaporizing liquid nitrogen, by absorbing heat from the environment. Then, this heat energy is propelled to the other side for liquefaction. Some small additional electric energy is needed to control the valves. The density of the N_2 liquid is about 1,000 times greater than that of the N_2 gas. As a result, the pressure of the air in the camera can raise up to more than 100 atm. But, due to Maxwell's demon factor the pressure of the gas for liquefaction could be reduced to about 4-5 atm. As such a situation was achieved in the famous design of the turbodetander by Kapitsa [9]. In our view, this process is enabled by a Maxwell's demon type of molecules extraction—a novel physical effect in the Cellular Automaton Universe that has not been yet realized.

Maxwell's Demon Taking away Kinetic Energy from Commoving Molecules

The decisive factor for the realization of the suggested RLN device is the second factor explicitly determined by the particulars of the Cellular Automaton Universe, namely by the functionality similar to that of Maxwell's demon selections. Maxwell's demon is a thought experiment created by James Clerk Maxwell, in which he suggested how the second law of thermodynamics might be hypothetically violated—see e.g. Wikipedia [10]. In this experiment,

a demon controls a small door between two chambers of gas. As individual gas molecules approach the door, the demon quickly opens and shuts the door so that only fast molecules are passed into one of the chambers, while only slow molecules are passed into the other. Because faster molecules are hotter, the demon causes one chamber to warm up and the other to cool down. Seemingly, this way, it could directly extract energy from the environment in apparent violation of the second law of thermodynamics. Most common explanation of this problem is that a more complete analysis of Maxwell's demon mechanism should include the necessity of consuming extra energy when erasing information, so it cannot deliver excessive energy.

Maxwell's demon looks like a very complicated construct, but in the Cellular Automaton Universe a Maxwell's demon configuration appears automatically as the bulk closed liquefaction chamber with a small orifice is a part of the fast-moving inertial frame of reference. Therefore, the trapped comoving molecules will slow down to the speed of the liquefaction chamber and thus acquire null energy with respect to the inertial frame of reference. In this situation energy is just merely transformed, so no violation of the law of energy conservation occurs. Throttling through a membrane with a number of small orifices does conversion of the gas into liquid. Conventionally, it is supposed that this liquefaction occurs due to the so-called Joule-Thomson effect [11]. Presumably, this explanation is not exactly correct. Our explanation with the new Cellular Automaton machinery appears more vigorous. It goes as follows: liquids are simply molecules packed tightly. So, after the commoving molecules are stopped, they undergo grouping by

van der Waals forces, which are susceptible to disturbance being comparatively weak. But as long as the stopped molecules are kept together by the suggested capturing mechanism, they sustain the agglomeration by van der Waals forces. With these molecules being packed tightly the throttled gas transforms into liquid. The obtained liquid assuredly accumulates the latent heat energy that is released at the input side of the given device. Thus, the working cycle of the RLN device continues. If safety is not an issue it might be easier to use liquid air rather than liquid nitrogen.

A Note on Some Possible Generalization

The van der Waals force, is a distance-dependent interaction between molecules. It vanishes quickly at longer distances between interacting molecules. Bringing captured molecules to a halt, the presented novel physical effect upholds their agglomeration by Van

der Waals force. This may play a fundamental role in various other fields: supramolecular chemistry, polymer science, nanotechnology, and so on. Presumably, the production of osmotic energy [12]; (Figure 2). works on extracting heat from the environment using the same suggested Maxwell's demon type effect of molecules extraction as our contraption for RLN. Fresh water going through a semipermeable membrane into a column performs the described Maxwell's demon molecule capturing type and their ensuing compactions by the van der Waals forces. Subsequently, these compactions catch external heat, and then decompose with increase in volume; so, the obtained external heat transforms into actional mechanical energy by expanding the corresponding column of water. This modus operandi of capturing molecules, their agglomerations with accruing and releasing energy appears analogous to that of the suggested RLN device.

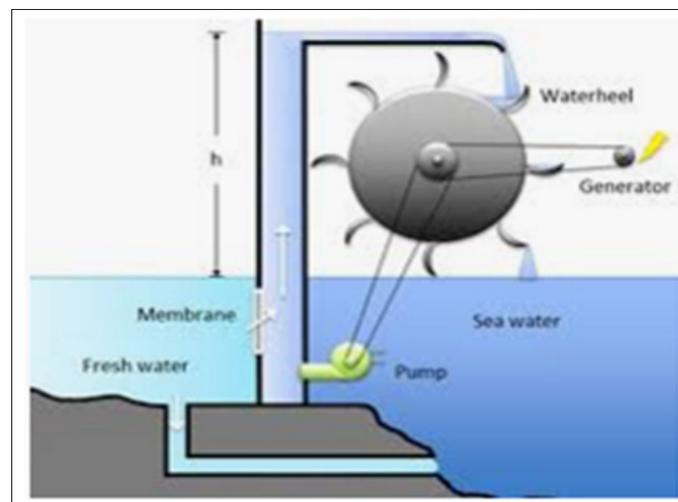


Figure 2: Osmotic power.

Conclusion

Developing plentiful production of clean energy is the technological problem #1 for the well-being of human civilization. The importance of this problem is not just determined by the disputable issues of Global warming see [5], but by the incontestable fact of approaching unavoidable lack of raw carbon fuels: gas, oil, and coal.

Nowadays, it is firmly believed that the only solution to the energy crisis problem is to conquer the superpower of thermonuclear reaction [13]. Unfortunately, realization of thermo nuclear reaction seems to encounter unsurmountable technical difficulties. "Commercial nuclear fusion still considered many decades away" [14].

However, our analysis of the energy concept in view of the Cellular Automaton construction of the Universe [3] somehow suggests that implementation of a controlled thermonuclear reaction could not be possible in principle. The point is that

commonly it is thought that crucial mass-energy relationship $E=\Delta mc^2$ considers mass and energy as separated entities while in our concept the energy is depicted as an operational influx in the created material formations. This way, as mass disappears in the course of controlled fusion the corresponding influx of energy in this configuration loses its operational capabilities. Contrast, in the uncontrolled situation of Hydrogen Bomb the fusion materials are forcefully compacted by implosion and held together for a very short time just to allow the influx of the Cellular Automaton energy to explode such material formations. Realization of the suggested RLN device has two decisive advantages. First, this device goes along with the existing technology of storing energy and planned development of micro grids [15] electric power systems for various buildings like residential, commercial and industrial as to local efficient energy generation system of electrical power stations. Second, liquid nitrogen can be an effective fuel for automotive industry. Mass production of electric cars is prohibitively expensive as they require rare metals for their batteries.

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