Re: Lizard engines and rat engines

Source: http://sci.tech−archive.net/Archive/sci.bio.evolution/2005−07/msg00327.html

- *From*: r norman <NotMyRealEmail@xxxxxxxxxxxx>
- *Date*: Fri, 15 Jul 2005 12:02:46 −0400 (EDT)

On Thu, 14 Jul 2005 20:17:10 −0400 (EDT), Tim Tyler <tim@xxxxxxxxxxx>
wrote:

>Perplexed in Peoria <jimmenegay@xxxxxxxxxxxxx> wrote or quoted:
>> "Tim Tyler" <tim@xxxxxxxxxxx> wrote in message news:db2791$2a2n$1@xxxxxxxxxxxxxxxxxxxxxx
>> > Perplexed in Peoria <jimmenegay@xxxxxxxxxxxxx> wrote or quoted:
>
>> > > First, according to the thermodynamics textbooks, a "closed system" smaller
>> > > than the universe as a whole is not only possible, it is an essential concept
>> > > in the idea structure. Thermodynamics textbooks are not written in code.
>> >
>> > Are you /sure/ they are saying that? They might be saying that you can
>> > build reasonable models of systems that assume no interaction with
>> > their enviroments − but do you /really/ think they are claiming such
>> > models accurately represent what is going on?
>>
>> What you think a "closed system" is and what the textbooks define a closed
>> system to be are apparently quite different. Check a textbook. A closed
>> system does interact with its environment.
>>
>> I stand by my claim that the notion of a closed system smaller than the
>> universe is an essential part of the idea structure in thermodynamics.
>> And, if it is possible for a system to be in thermal equilibrium with
>> its surroundings (another essential element of the idea structure), then
>> yes, closed systems really can exist.
>>
>> You have an extremely bizarre, almost Edserian phobia of models if you think
>> that fluxes of neutrinos, photinos, or whatever mean that we have to throw
>> out standard thermodynamic terminology and standard thermodynamic reasoning.
>>
>> Apparently, your view is that NO MODEL accurately represents what is going on.
>> Do you really believe that this view is useful?
>
>Er − this is a *terminological* issue. It's about the meaning(s) of the
>term "closed".
>
>Personally, I see no problem with using "closed" to mean:
>
>``Closed system. A physical system on which no outside influences act;

> closed so that nothing gets in or out of the system and nothing from
> outside can influence the system's observable behavior or properties."
>
> − http://www.lhup.edu/~dsimanek/glossary.htm
>
>``An open system can be influenced by events outside of the declared
> boundaries of a system. A closed system is self−contained: outside
> events can have no influence upon the system."
>
> − http://en.wikipedia.org/wiki/System#Types_of_systems
>
>Obviously this usage rubs you up the wrong way.
>
>However, I /like/ using "closed" in this way − and apparently so do
>a very large number of other people.
>
>I doubt efforts to get me to use closed to refer to the − IMO − rather
>esoteric idea of a system isolated in terms of its atoms and matter −
>but not thermally − are going to prove effective.
>
>Since E=mc^2 tells us that energy and mass are fundamentally
>interchangable, the whole idea doesn't make very much sense to me.
>
>For another thing, it would be an example of non−self−explanatory
>terminology: nowhere in the term "closed system" does it say that
>that the closure applies to physical matter, but not to heat or signals.
>
>Introducing that sort hidden detail in a common term which is basically
>two ordinary english words joined together is one of the many ways in
>which misunderstandings and misconceptions start.

The traditional and classical distinction between closed and isolated systems is useful for many aspects. It was proposed to discuss heat engines, the original subject matter of thermodynamics. A compartment inside a heat engine (or a refrigerator, a different kind of heat engine) can and does in fact sometimes exchange matter with another compartment and at other times exchange heat and energy without any exchange of matter. That is, it is often closed but not isolated. Whether you like it or not doesn't matter. It is a sad fact that so many ;people have been sloppy about this for so long that the improper usage has become all too common. That does not make it right.

Incidentally, signals don't change the story. As far as we know, there can be no exchange of signals (information, if you will) without the simultaneous exchange of energy or material. A signal must be carried by a particle, perhaps a photon or phonon or electron. In order to receive and respond to a signal, the receiver must absorb energy from the transmitter (or the channel). Whichever, the receiver is not isolated. If matter is involved, the system is not closed. If you want to introduce relativistic notions of matter−energy conversion, then simple−minded thermo isn't going to do and you are

going to have to move into an entirely different realm of mathematics with its own peculiar language quirks.

You are right about the misunderstandings and misconceptions. That is precisely why some people are so careful to make sure the others understand the proper distinction between "closed" and "isolated".

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- ***Follow−Ups***:
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    - ◊ *From:* Perplexed in Peoria

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    - ◊ *From:* dkomo
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    - ◊ *From:* Tim Tyler
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