

Article

## Thermodynamic Proof that Good Always Triumphs over Evil

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Received: 21 Mar 2011; Published: 22 Mar 2011

### Abstract

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A proof is given that good always triumphs over evil in the framework of thermodynamics, the science that governs the operation of the known universe.

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### Introduction

The age-old idiom that ‘good always triumphs over evil’, as a general philosophical rule, dates back at least to the 18<sup>th</sup> century, such as found in Arnaud Berquin’s 1792 *L’ami Des Enfants* (*The Friendly Child*), a collection of stories in which good always triumphs over evil. In modern Internet times, the query: ‘Does good always triumph over evil?’ is a popular search request.

The historical model of good and evil is rooted in the circa 3500BC Ra theology framework of the daily and yearly life-death-rebirth cycle of the sun, which was said to be ‘born’ each morning and to ‘die’ each night, a period of darkness in which the sun was said to do battle with the forces of evil, only to triumph in the end and to be reborn again with the start of the next day. This good-vs-evil model eventually served as the basis for an individual human morality system, as embodied in the concept of the 42 negative confessions, and the later Ab-ra-ham-ic theologies (Torah religions) and B-ra-hma-ic theologies (Vedic religions) or "Father Ra born of Nun" religions, which accounts for 72 percent of the belief systems of the modern world.

The new belief system of how the world operates is rooted in the sciences of chemistry, physics, and thermodynamics. Specifically, with the publication of German physicist Rudolf Clausius’ 1865 *The Mechanical Theory of Heat*, the new view emerged that the universe is governed by a new type of cycle: that of the ‘irreversible’ heat cycle, governed by the laws of energy and entropy, the nature of this underlying irreversibility quantified mathematically by the Clausius

inequality. This framework led to the initiation of the subject of chemical thermodynamics by American engineer Willard Gibbs in 1876.

Into the 1930s, building on the work of Gibbs, principally through the efforts of Gilbert Lewis (*Thermodynamics and the Free Energy of Chemical Substances*, 1923) and Edward Guggenheim (*Modern Thermodynamics by the Methods of Willard Gibbs*, 1933), the terse view had emerged that natural earth-bound freely going processes and reactions, which are of the type that occur between humans reacting to each other, are governed by the following two simple rules:

- (1) for a *natural* isothermal-isobaric process, Gibbs free energy must decrease ( $dG < 0$ )
- (2) for an *unnatural* isothermal-isobaric process, Gibbs free energy must increase ( $dG > 0$ )

The details of this logic were first ferreted out by Lewis, who, working in collaboration with Merle Randall, spent nearly three decades calculating the free energies of various chemical substances; hence the naming of the inequalities:  $dG < 0$  (or  $\Delta G < 0$ ) and  $dG > 0$  (or  $\Delta G > 0$ ) as the ‘Lewis inequality for natural processes’ and ‘Lewis inequality for unnatural processes’, respectively, so as to distinguish them from the various Gibbs inequalities, on which they are based.

Into the 1940s, the theory of thermodynamic ‘coupling’ was synthesized, initially experimentally in Fritz Lipmann’s free energy coupling logic (‘Metabolic Generation and Utilization of Phosphate Bond Energy’, 1941) and later in terms of classical chemical thermodynamics theory in Ilya Prigogine’s explanation that thermodynamic coupling allows weaker coupled reactions to progress in a direction contrary to that prescribed by its own affinity (*Etude Thermodynamiques des Phenomenes Irreversibles*, 1947).

The extension of this logic to the human sphere of operation concludes that if thermodynamics governs the operation of the known universe, then so to must it govern human affairs, whereby therefore the Lewis inequalities for natural and unnatural processes, as well as thermodynamic coupling, must apply absolutely to the governance of human interactions. Therefore, with the substitution of the word ‘natural’ (Guggenheim’s language), for good, and ‘unnatural’ for evil, a simple proof can be given to explain the notion that natural will always triumph over unnatural.

Preliminaries to this logic include British philosopher John Stewart's 1789 ‘moral movement’ theory, wherein he viewed a human as a type of intelligent animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion, some motion being ‘moral’ some ‘amoral’.

Likewise, German polymath Johann Goethe’s 1809 human elective affinity theory viewed each human to be a large evolved reactive chemical moving about on the surface of the earth, whereby

human-human interactions are governed by the laws of reaction of mutual chemical affinities; chemical affinity being a precursor to free energy, as proved in German physicist Hermann Helmholtz' famous 1882 'On the Thermodynamics of Chemical Processes'.

Goethe specifically posited that morality, or rather the human conception of good and evil, could be defined precisely by, in his own words, the 'moral symbols' of physical chemistry, in which a person was viewed as a type of evolved reactive chemical whose reactions and behaviors to other people are determined by the forces of chemical affinity as outlined in the standard physical chemistry textbooks of his day, predominately Swiss chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*.

The first scientific proof that a human can be viewed as a type of reactive molecule is found in the published calculation of the molecular formula for a human, done by American limnologists Robert Sterner and James Elser (*Ecological Stoichiometry*, 2002), who view whole organisms as if they were 'single abstract molecules', and specifically define the human as a reactive 22-element molecule. Two other independent calculations for the molecular formula for the human, defined as a molecule, corroborate this view (*New Scientist*, 2005; *Human Chemistry*, 2007).

### Proof

The simple proof of the postulate that 'good always triumphs over evil', based on the modern-day physical sciences, is as follows:

- (a) A person is large multi-element reactive animated molecule (human molecule).
- (b) So-called "good" actions, or rather "natural" actions, are governed by the Lewis inequality for a natural process ( $dG < 0$ )
- (c) So-called "bad" (or evil) actions, or rather "unnatural" actions, are governed by the Lewis inequality for an unnatural process ( $dG > 0$ )
- (d) Both natural and unnatural processes are thermodynamically "coupled" together, such that *natural* processes energetically drive the *unnatural* processes and that some reactions will progress in a direction contrary to that prescribed by their own affinity.

Goethe's postulate of moral symbols logic equates, in modern parlance, to the explanation of morality or of specific second-by-second good (natural) or bad (unnatural) actions terms of firstly the Lewis inequality (1923), which describes what is "natural" and "unnatural" in human interactions:

<b>Measure</b>	<b>Result</b>
$\Delta G > 0$	A process, interaction, action, or reactions quantified as "unnatural" (bad or wrong, in an anthropomorphic sense).
$\Delta G < 0$	A process, interaction, action, or reactions quantified as "natural" (good

or right, in an anthropomorphic sense).

$$\Delta G = 0 \quad \text{Equilibrium state}$$

Then, secondly, how these inequalities relate to thermodynamic coupling:

$$\Delta G_{total} = \sum_{i=1}^k \Delta G_i \quad \text{Sum of the total set of internal natural and unnatural processes of a given system of people.}$$

$$\Delta G_{total} < 0 \quad \text{The actions of the system will be considered "natural" or good as long as the total system is indicative of negative Gibbs free energy decrease actuating during the process or reaction.}$$

This would then define morality for the system. In the case of global conflicts of morality, a summation (similar to previous) would need to be done to determine if the overall coupled systems (e.g. countries at war), would be a natural or unnatural process. In the big picture of things, all of this would need to be explained in terms of the spin cycles of the universe, which thus drive the coupling, and thus the individual measures of morality.

This is the thermodynamic explanation to age-old idiom that "good always triumphs over evil", which means that natural processes will always triumph over unnatural processes or technically that the total set of processes will only go when the system as a whole shows an entropy increase or 'transformation content increase', in the original Clausius sense of the term.

## References

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1. EoHT.info
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