

## NOT JUST ANY WORD

Why isn't it commonly used in everyday speech? Why doesn't every child know what it is and how it affects his or her world? And especially, why don't they know that's it within their power (or energy) to affect it. It's called "entropy", my friends.

Entropy – the second law of thermodynamics. (Ok, in English please!) Some people who think they have a grasp on the meaning of entropy might tell you that it is the progression of "order to disorder". That is only partially true. Because prior to an ordered state, there was a state of disorder. Let's look at the perfectly constructed sand castle that you built on a gorgeous beach day. You spent time and energy pulling sand that was previously in disarrangement, together into an organized design of sandy architecture. However, unless you continue to put forth more energy to conserve your masterpiece, an inevitable return to a disordered state is a sure bet: a sudden unexpected visit from an ocean wave or sharp gust over the carefully molded parapets; the errant beach ball come hurling in to smash its chiseled walls; an adorable tyke from the neighboring picnic simply runs full-throttle directly into the structure, demolishing it in less than one second. These examples of energy that would return the sand to its previous disordered state (high entropy) could be held off if the builder were to guard the delicate edifice from such events by his constant application (energy) of protective efforts. The sand castle could be protected indefinitely, but realistically, a return to disorder is in the cards for the castle despite its creator's ingenuities of preservation. Ah, but there is really good news here! Although the effects of entropy are inevitable, the castle builder, powered by the unique asset known as the human brain, is able to direct energy that can increase the longevity of the ordered (low entropy) state of the sand castle.

Entropy – be it high entropy or low entropy – is the word. Say it. Think about it. Look around you for other examples of it. They are infinite, for there is nothing in the universe that is not affected by it. But there is only one "thing" that we know of that consciously and intelligently directs its energy to affect entropy – the human brain.

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## Entropy and Tiger Woods

Usually when you hear a word such as "entropy", you're expecting the erudite, scientific description involving "thermodynamics", "energy", "closed systems", and the like. But when it comes to entropy, the second law of thermodynamics, or what I affectionately call "the law above all laws", it simply means "disorder-->order-->disorder". We must also discuss *high* entropy and *low* entropy. The dynamic of entropy not only *can* be applied to all things, but *is* applicable to all things. Even to the great golfer, Tiger Woods.

I use Tiger, and more specifically, Tiger's golf career, to demonstrate my point because his story is a perfect example of how entropy works and how inescapable are its properties. Some people think they have a grasp of the meaning of entropy as "order to disorder". But that is only partially correct. For whatever example we use to manifest the flow of entropy, we must always begin with "disorder" and how energy is applied.

Forty years ago, Tiger Woods was born. So let us safely assume that he did not have a golf career at that time. (Disorder). But by age 2, his dad Earl Woods had begun training Tiger to swing a golf club. In other words, Earl used *energy* to teach his son the early basics of the game of golf, but until he can actually correctly play a round of golf, Tiger's game is at high entropy, a state of disorder. Little by little, Earl Woods and subsequent coaches applied further energy until the apt pupil Tiger Woods showed signs of talent and discipline for the sport – enough to begin entering tournaments. It wouldn't be long before he dominated every level at which he competed: Juniors, Collegiate, Amateur, and eventually the PGA. From 1997, for twelve solid years, Tiger Woods was the odds on favorite to win whatever tournament he entered. (Career status: order/ low entropy). Of course, it wasn't due only to his skill and discipline, but Tiger was relentless in putting forth the time and *energy* he knew was required to maintain and ordered, low entropy golf career.

Enter 2009. Not by any stretch a bad season for Tiger – 6 PGA Tour victories. However, he was unable to snag any of the four majors. Not only that, but during that year's final major event, Tiger committed errors that cost him the title in a close finish. He seemed distracted. He even seemed "mortal". His game was thrown off by injuries that were far more serious than he allowed his competitors and fans to know. And probably the worst of the many distractions that would throw its high entropy monkey wrench into the works: domestic discord. The highly disciplined energy of focus and finely chiseled routine proved to be the ticket to disorder for Tiger's number 1 status, and his seemingly indestructible golf career.

For those of you who are biting your nails with anxiety, dread not. Within 4 years, Tiger would regain a solid grip (no pun intended, golfers!) on his game and reclaim the World Number 1 ranking. Injuries, however, continue to plague his career. But we know all about that, don't we? It's called *Entropy*.

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## I Changed My Mind – Again!

Did you ever believe something to be true, then find out with positive proof that it really isn't true at all? Take the shape of our planet for example. Until Magellan, as legend would have it, sailed around the globe, it was widely believed that the Earth was one gigantic flat Frisbee instead of a spherical beach ball. Sometimes it's pretty hard to get our head wrapped around a new thought or idea, especially when a long held belief is dislodged by it. But what can also occur when a new fact is introduced is a sudden awareness that can supplant the prior belief in an instant. How does this happen?

Our 200,000 year old brain, which I like to compare to computer to computer hardware, enables our mind ("software") to think organized thoughts, introduce new ones, imagine entire scenarios, and even store them all in our cerebral memory files. Each time we learn something, our mind takes an evolutionary leap. We are "thought evolved". The elasticity of our brain allows our mind to function this way.

Thanks to this prefrontal lobe version of the brain, we have been able to develop ideas into provable facts – Science to be exact. We can advance our theories through testing, trial, error, and further testing which leads us to scientific information, technology, and extraordinary discoveries through space exploration.

Thought evolution is a unique feature of the one-of-its-kind-in-the-Universe (as far as we know) human brain. Because we are thought evolved beings, we can always upgrade our software to improve what is stored in its memory.

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## Oh, My Messy Desk!

A few of the perfectly positioned items are slightly askew. Perhaps there are some files that need folders. Some of that mail might require further attention. But you're ready to leave the office right now, so you'll arrange everything tomorrow. After several days, a pattern has formed and things have started to take on a disheveled appearance. The low entropy arrangement has been transformed into a disorderly, high entropy disaster. But don't forget – before you made everything neat, the elements of your office supplies were not even together at all. They started out in a high entropy state. Then, you placed each item where you wanted it to be. Your desk can keep its pristine condition if you rearrange every item that you used that day into its folder, cubby, inbox, or caddy prior to leaving the office, and voila! No more messy desk! You can do it. It's because you have the one entity known to us that can direct its energy in order to maneuver entropy: the human brain. Just about the same amount of energy that you used to create disorder around your workspace would do the trick for maintaining an orderly, low entropy desktop. So let's tidy up! Or not.

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## YOUR NEIGHBORHOOD

It's where you live. But have you really checked out the environment? Do you truly know your neighbors and what they're up to? That one guy, for example – the one they call "The Man in the Moon". He's got your back. That's just what you'd want from a good neighbor. He makes sure that your home planet (which I am assuming is Earth!) stays at a 23 ½ degree tilt on its axis which ensures that we will continue to enjoy a steady rotation without wobbling and also a few other perks such as ocean tides, seasons, and oh yes – human life. We creatures with the human brain.

That bright star keeping things lit up during the day, but stays out of view at night so can get a little shuteye, the Sun, is also a great neighbor. But we have to watch out for his magnificent solar winds. They could wipe us all out. Fortunately though, our Earth is equipped with a core which spins at about 1,000 miles per hour, spreading an electromagnetic field all over the place, protecting all us Earthlings from the solar winds. Also pretty lucky for us is that perfectly cozy distance we keep from the sun: 93 million miles. It's so perfect a distance, in fact, that we affectionately call it "The Goldilocks Zone". This is why our home is rich in liquid water. Our Sun could be a hot, deadly force. But, because of that "just right" Goldilocks distance, we have enough elbow room to keep the water flowing for life as we know it.

Jupiter is another superstar of a good neighbor. Ever darling comets which constantly bombard other neighbor planets often do not reach Earth because Jupiter plays the role of a giant celestial catcher's mitt. Of course, some comets, meteors and asteroids will find (and have found) a way, but the enormous gravitational pull of our heftiest neighbor prevents catastrophic collisions from befalling the Blue Planet.

Our nearest neighbor, Mars, is becoming less and less a stranger even as we speak. We mailed a package four years ago which contained the rover "Curiosity". Mars signed for the delivery and in quite neighborly fashion, has been quite a hospitable host, allowing "Curiosity" to collect and transmit data back to us nosy neighbors without any complaints. Perhaps it won't be much longer before we send a package there with a few local dwellers on board. Then we will really get to know our neighbors?

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