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One day, in a class at N. C. State University, Professor Alonzo F. Coots said to his students in chemistry, "I'm going to make a statement this morning which will be the most profound statement you will hear all year, and one of the most profound you will ever hear. Then you are going to go home and tell your parents what I said and they are going to wonder why they are paying for what you are learning here. The statement is - - - 'Water runs downhill'". Dr. Coots went on to explain that water running downhill is an expression of the Second Law and can be generalized to say that things seek a lower energy state. In subsequent classes he explained how chemical reactions can be forecast if one knows on which side of an equation the larger amount of "free" energy lies. Chemical reactions always proceed toward the lower energy condition or away from the "orderly" toward the "disorderly".

Now consider Kenneth Boulding's statement that everything that happens has the potential for happening and will never happen again. For something to happen there must be two energy states, one higher than the other. That is just exactly what Sadi Carnot said about steam engines. To get work out of steam there must be a high temperature reservoir and a low temperature reservoir. The consequent and necessary follow-up, that the heat can never again be used for work, simply affirms that it is used up, has become useless, has entered the entropy¹ pool.

The profundity of all this is found in the recognition that life itself proceeds only because there are two energy states. The life process is an expression of the Second Law. Every action of any kind whatsoever proceeds at the cost of energy moving from a "free" condition of availability to a "bound" condition of unavailability. The condition of unavailability is called "Entropy".

Our first circular tried to define the Second Law and Entropy, but it seems worth while to spend some more time getting across the general idea of it. It is difficult to grasp at first, but the more time you spend thinking about it the more it becomes apparent that the Second Law is so basic it needs a lot of thought.

Jeremy Rifkin, who was quoted in the first circular, has provided the Center with an advance draft of his forthcoming book, Entropy: A New World View. Here is a quote:

The Entropy Law destroys the notion of history as progress. The Entropy Law destroys the notion that science and technology create a more ordered world. In fact, the Entropy Law transcends the modern world view with a

¹Where the word "Entropy" is used you may read "waste", "pollution", "junk", "trash", "ground state", or a wide variety of other terms for the terminal states of matter. Every action and every process contributes to entropy, but some more than others; e.g. A cadillac results in enormously more entropy than does a bicycle.

force of conviction that is every bit as convincing as was the Newtonian world machine when it replaced the Medieval Christian World view of the Roman Church.

The Entropy Law has a special power. It is so utterly overwhelming that once fully internalized, it transforms everyone it comes in contact with. It is this almost mystical attraction that makes the Entropy Law so frightening to take hold of. Yet when the opportunity presents itself, few people can resist the temptation to do just that. The allure resides in its all encompassing nature. The Entropy Law is the assassin of the truths of the modern age; truths that once provided us with an illusion of security and order. Now those truths have metamorphosed into monstrous lies which threaten our continued existence. The Entropy Law is our escape to freedom. As it methodically performs its business, unmasking and disposing of the many lies that have for so long governed our world, we experience the first ecstasy of relief that comes of being released. Yet, at the same time we feel desparately anxious, not knowing what 'New Order' the Entropy paradigm will create.

Step by step the Entropy Law will provide us with an understanding of exactly why the existing paradigm has broken down. Our generation, caught between the old paradigm that we were nurtured on and the new Entropy paradigm just emerging will begin to marvel at how we could have believed in principles and axioms so obviously false. We will stumble into the new paradigm, ill at ease and groping like a visitor to a foreign land. Unable to completely shed our native world view, we shall take on the new Entropy paradigm as a second language, never completely comfortable with and never able fully to articulate it into our daily routines.

For our grandchildren's generation the entropic world view will be like second nature -- they will not think about it, they will merely live by it, unconscious of the hold Newtonian mechanics had over us.

A central "truth" of the existing paradigm holds that employment is a function of production which is a function of consumption, which is a function of income earned from employment, which is a function of production, which is a function of etc., etc., a continuous circle that destroys the earth's resources and increases entropy in astro-nomic multiples of gigawatt hour equivalents. This central "truth" cannot survive where the irreversible effects of the Second Law are appreciated.

The Center believes that there will emerge out of the new understanding for the Second Law a new and universally acknowledged morality which may be stated: "The moral choice lies with the path of least entropy." Or, "What harms the earth and the earth process least is the moral choice." I have learned of a paper written by an N. C. State University chemist on the Moral Imperative of the Second Law. It was written years ago and appeared in a Chemical Journal. I have not found it yet, but hope to be able to report on it soon.

Dr. Clayton S. Stalnaker, Department of Philosophy and Religion, NCSU, has agreed to be the Center's Consultant for Philosophy.