

Wellness and the Thermodynamics of a Healthy Lifestyle

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Wellness has recently emerged as an industry sector and a multidimensional academic discipline that includes psychological, physiological, social, demographic and ecological dimensions. Wellness enhances resilience and is therefore a survival imperative that is fundamental to life, yet current Western definitions of wellness do not refer to fundamental a priori principles. Eastern medicine on the other hand does refer to universal principles and suggests that bliss is a natural homeostatic set-point and that wellness can be achieved by living according to the Tao. Congruence between Eastern concepts and thermodynamics further suggests that Qi is related to information and flow, and that wellness arises from maximal flow and minimum entropy production. These principles, which can be represented by an Illness-Wellness Vortex, suggest that the healthiest lifestyle provides maximal enjoyment with minimal waste. Thus, conscious consumption and cultivation of psychological flow can provide the means for achieving wellness through aligning internal and external states.

What Is Wellness?

Striving to live “well” can be seen as a motivating force throughout the evolution of human culture, technology and medicine. In recent times wellness has emerged as an academic discipline that intersects many fields. Wellness is also an emerging industry sector that in 2007 was estimated to generate more than US\$1 trillion from the convergence of the natural medicine, fitness, health foods and beauty industries (SRI International, 2008). More recently, the wellness industry cluster, including complementary and alternative medicine, nutrition, fitness, beauty, anti-ageing, preventive health, spas and resorts, medical and wellness tourism and workplace wellness was estimated to represent a \$1.9 trillion global market (SRI International, 2010).

The concept of wellness is still evolving and applies not only to individuals but also to communities, businesses, economies and the planet as a whole. Being holistic and multidimensional, wellness includes physiological, psychological, social, demographic and ecological dimensions and thus involves all aspects of life, including occupational, recreational and spiritual pursuits, as well as social, financial and educational resources. The notion of wellness can therefore be expanded beyond health

to include environmental sustainability, corporate social responsibility, social justice, human security and conscious consumption.

In his book “High-Level Wellness”, Halbert Dunn (1961) opened the modern discourse on wellness, which he defined as, “an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable” (Dunn, 1961, p. 4). In this definition Dunn acknowledges that wellness is dependent on the relationship with the environment by stating that wellness, “requires that the individual maintain a continuum of balance and purposeful direction within the environment where he is functioning” (p. 4). He also states that “wellness is a direction in progress toward an ever-higher potential of functioning” (p. 6).

Dunn’s work was elaborated on by Travis (1975) who developed the model of an Illness-Wellness Continuum, whereby illness and wellness are seen as a continuum with premature death and disability on one side and high level wellness on the other. More recently, the (US) President’s Council on Physical Fitness and Sports proposed a uniform definition of wellness as, “a multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of

well-being” (President’s Council on Physical Fitness and Sports (U.S.) 2001, p. 1). Yet another definition used by the National Wellness Institute suggests that; “Wellness is an active process through which people become aware of, and make choices toward, a more successful existence” (National wellness Institute).

At a basic level, wellness may be considered similar to “health”, which, is defined by the World Health Organisation as; “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organisation, 1948). However, while wellness is always viewed as positive, health may be seen to have different qualities and be classified into three broad areas: ill health, average health and enhanced health, which together form an Illness-Wellness Vortex (Figure 1) that can be represented as three dimensional projection of Travis’s Illness-Wellness Continuum (Cohen, 2003).

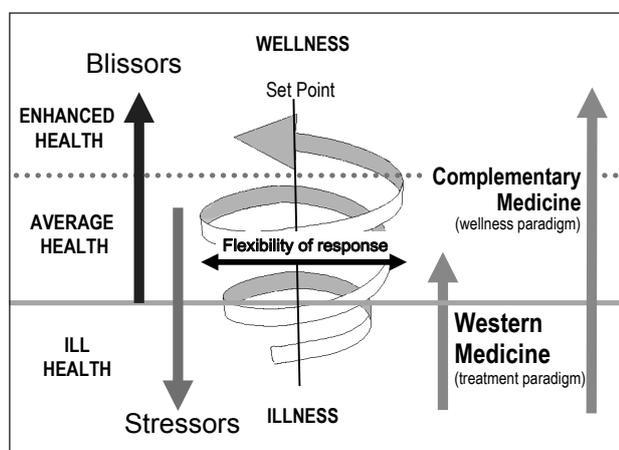


Figure 1 - The Illness-Wellness Vortex (adapted from Cohen, 2008)

The Illness-Wellness Vortex

When distinguishing different segments of the Illness-Wellness Vortex, the division between ill health and average health is based on definitions of disease. Diseases are generally defined in Western medical terms based on symptom patterns such as used by International Classification of Diseases and the Diagnostic and Statistical Manual of Mental Disorders or other diagnostic parameters or classifications. Western medicine is based on a treatment paradigm that takes a reactive approach, which aims to define and understand illness and focuses on shifting people from ill health to average health by developing interventions that treat disease and control *stressors*. Complementary medicine, on the other hand, is based more on a wellness paradigm and takes a proactive approach that attempts to facilitate movement towards enhanced health. Thus, while there are forms of complementary medicine that parallel Western medicine and move people from ill health to average health, complementary medicine is more often concerned with moving people from average health to enhanced health by focusing on *blissors*.

While the divide between ill health and average health can be distinguished by disease categories, the divide

between average health and enhanced health, is less distinct. Enhanced health is more than just being disease free, it is multidimensional and assumes high levels of physical strength, stamina, mental clarity, subjective wellbeing, social engagement, along with maximal longevity, enjoyment and fulfilment from life. These multiple dimensions make the divide between average health and enhanced health more difficult to define and study, as any metrics used must take into account multiple dimensions. Yet at any point, movement up the Illness-Wellness Vortex corresponds with a greater flexibility of response. Thus, it is possible to enter an upward spiral towards wellness by engaging *blissors* or a downward spiral towards illness by succumbing to *stressors*.

Blissors are activities that contribute to “virtuous spirals” that produce elevated levels of functioning, productivity and enjoyment. *Blissor* activities, which involve learning, growing, relating, creating and evolving are inherently enjoyable and evoke positive emotions that “broaden and build” capacity by enhancing homeostatic range and allowing greater flexibility of response (Fredrickson, 2003). *Stressors*, on the other hand, include injury, ageing and social, financial and environmental factors which reduce functional capacity and evoke negative emotions that fuel “vicious spirals” towards illness. The dynamic interplay between these forces determines the position on the vortex at any given moment.

When viewed in terms of an Illness-Wellness Vortex, wellness and homeostatic range increase with movement up the vortex. Thus, the best form of prevention is to pursue a lifestyle that maintains the highest possible position on the vortex for as long as possible. Such a lifestyle is not only the healthiest and most enjoyable, it also offers the greatest resilience and capacity to cope with life’s challenges and thus provides the best platform for further progress towards higher levels of functioning. At all levels however, homeostasis is anchored by a central axis that represents the homeostatic “set point” or point of ultimate stability. This central axis represents an absolute reference point, or point of balance between external and internal processes. At this point of equilibrium, a dynamic stability or stillness is achieved so that no specific corrective action is required to maintain structural or functional integrity.

Wellness and Universal Principles

In maximizing resilience, wellness naturally enhances survival, thus there is an evolutionary imperative for organisms to strive towards wellness. It would seem therefore, that wellness should be linked to fundamental biological and physical processes. Current definitions of wellness however, do not provide any reference to basic biological processes or fundamental physical laws; instead they are framed in terms of “integrated functioning”, “positive health”, “quality of life”, and “successful existence”. Western science it seems is yet to develop mathematical or physical laws that govern subjective states and Western psychological theories are currently based on empirical evidence rather reference to *a priori* principles.

In contrast to Western views of wellness, which do not provide any reference to fundamental laws or principles, Eastern medicine takes a cosmological perspective that sees the microcosm reflected in the macrocosm whereby fundamental cosmological principles apply at all levels. The conceptual framework of traditional Chinese medicine is based on universal concepts that include *Tao*, *Qi*, *five stages of transformation* and *Yin and Yang*. These concepts, which were originally framed in terms of Eastern mysticism and cosmology, can be seen to have counterparts within the fundamentals of Western science (Figure 2). Thus, the concept of *Tao* can be seen to relate to “infinity”, *Qi* to “information”, the five stages of transformation to the process of “communication” and *Yin and Yang* to “complementarity” and “homeostatic balance” (Cohen, 2002). These concepts can also be mapped to the Illness-Wellness Vortex, which then provides a conceptual model that integrates both Western and Eastern concepts (Figure 3).

<u>Basic Philosophical Concepts of TCM</u>		
Tao		Experience
Chi		Flow
5 Elements		Transformation
Yin Yang		Balance
Bu/Xie		Evolution/Entropy

Figure 2 - Basic philosophical concepts of traditional Chinese medicine and their graphical and conceptual counterparts (Cohen, 2008)

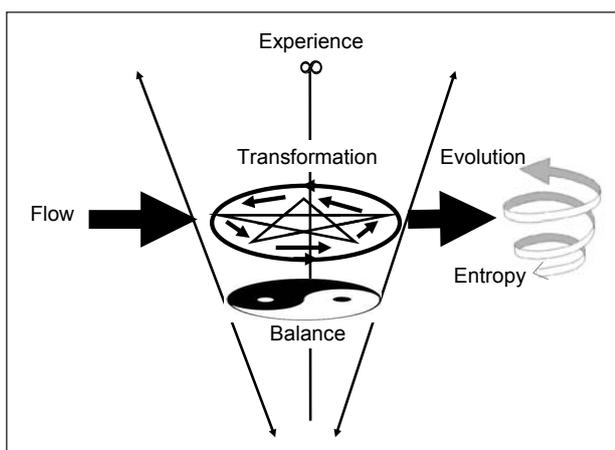


Figure 3 - Pictorial conceptualisation of wellness concepts from traditional Chinese medicine (Cohen, 2008)

Tao, Infinity and Bliss

The central axis of the Illness-Wellness Vortex, which represents the point of homeostatic equilibrium, can be viewed as the essential “core of being”, which is often referred to in Eastern traditions as an eternal and immortal aspect of the self that is one with the Tao. The concept

of Tao in Eastern philosophy refers to the “way of the universe” or “the infinite order of nature”. To directly experience the Tao is to experience “pure bliss”. This is expressed by Vedic scholars who consider bliss, or *ananda* in Sanskrit, to be the innermost level of the individual self as well as the nature of the whole universe. Bliss is therefore said to be the goal of the path to enlightenment and found in the deepest experience of meditation (Yogi, 1986). This suggests that the state of bliss is the ultimate homeostatic set point and that a healthy lifestyle involves being as blissful as possible by living according to the Tao and being anchored in the “deep inner well of being”, or “infinite wholeness”.

The Eastern concept of being “at one with the universe”, can be seen to parallel Western notions of health as “wholeness”. Furthermore, the concept of Tao, which derives from Eastern mysticism, can be seen to have a direct parallel in Western science with the mathematical concept of *Absolute Infinity*.

The concept of infinity has been a subject of Western debate for centuries culminating with the concept of Absolute Infinity or “ Ω ” being developed by Georg Cantor in the late 1800s when he founded the theory of transfinite numbers and mathematical set theory. Set theory served to unify the different branches of mathematics and in equating the Absolute Infinite with god has been likened to “a form of exact theology” (Rucker, 1884, p. 81), which provides a mathematical basis for dealing with intuitive notions of infinity and the limits of thought.

An important feature of the mathematical concept of Ω is that it is, by definition, incomprehensible and thus unable to be grasped by the rational mind. The incomprehensibility of Ω is ensured by the Reflection Principle, which states that any conceivable property of Ω is also a property of a subset of Ω . Thus, if the rational mind attempts to grasp hold of Ω , it can be assured that it is grasping merely a property of Ω and not Ω itself (Rucker, 1984). This principle is closely paralleled within Eastern philosophy with the first sentence of the classical text the “*Tao Te Ching*” stating that the Tao that can be spoken of is not the real Tao (Feng, 1989).

The inherent incomprehensibility of the Tao and Ω places these concepts beyond thought but not beyond direct experience. Throughout the ages the experience of infinity has been alluded to by Eastern and Western mystics, theologians and poets, who associate it with the experience of bliss or “god”. However, while it may be possible to directly experience the Tao or Ω , the inherent incomprehensibility of the experience limits the ability of the rational mind to fully grasp it. This prevents the experience being fully communicated through language other than through allegory and poetry, such as the word of William Blake who wrote:

*To see a world in a grain of sand,
And a heaven in a wild flower,
Hold infinity in the palm of your hand,
And eternity in an hour.* (Blake, 1803)

While the axis of the Illness-Wellness Vortex can be viewed as representing a state of “bliss”, “perfect homeostasis”, or “being whole”, and “at one with infinity”, achieving this state requires the dynamic balance between internal and external forces. Eastern medicine describes this process as being achieved through the continual cultivation of the flow of “life energy” or Qi.

Information and Qi

The concept that life is dependent on a subtle form of energy is one of the most ubiquitous concepts within Eastern medicine. Subtle energy, often termed “vital force”, “life energy”, “life force” “prana”, “chi”, or “Qi”, is said to flow throughout the body along certain defined pathways or meridians and maintain both physical and psychological processes. The normal flow of Qi is seen as a requirement of life and a healthy lifestyle is seen to maintain its continuous and unimpeded flow. Eastern therapies such as acupuncture therefore focus on restoring the natural energetic flow in order to facilitate homeostatic responses (Cohen, 2003).

Qi is a subtle concept that refers more to the idea of flow than to energy. The Chinese character used to denote the concept of Qi is made up of two Chinese characters, one of which means “the flow of something that is difficult to grasp” (Omura, 1982, p. 24) and another that refers to “rice” or “source of energy of a human or animal” (Omura, 1982, p. 24). Thus, Qi refers to “the flow of something that is the source of vital energy to humans and animals” (Omura, 1982, p. 25) and, as Porkett (1974) states; “whatever the context and absolutely without exception, [Qi] always implies a qualitative determination of energy” (p. 167-168).

In contrast to the Eastern concept of Qi or life energy, Western concepts of energy are more precise and do not include a form of energy specific to living systems. The concept of Qi is therefore often rejected as being unscientific. The concept of Qi, however, can be seen to parallel the laws of thermodynamics, which are universal laws that govern the qualitative and quantitative aspects of energy. The First Law of Thermodynamics defines the quantity of energy in the universe as fixed and states that matter and energy cannot be created or destroyed, only converted from one form to another, while the Second Law of Thermodynamics describes the quality of energy in terms of entropy, and defines a universal tendency towards disorder so that; in any isolated system entropy always increases.

The principle of consilience suggests that there is an underlying unity of knowledge whereby a small number of natural laws may underpin seemingly different conceptual frameworks (Wilson 1999). This principle is evident with the Second Law of Thermodynamics and Eastern concepts of pathophysiology, which view pain and disease as arising from a blockage of Qi. Similarly, the First Law of Thermodynamics can be seen to parallel the idea within Chinese medicine that Qi is always preserved. Thus, when the flow of Qi is obstructed, Chinese medicine considers

there to be excess of Qi above and a deficiency of Qi below the obstruction both of which are said to contribute to disease causation.

While the Chinese view of living processes is consistent with the notion of entropy, it seems somewhat surprising that, despite its universal application, entropy is not widely utilised within Western medical science to describe “biological disorder”, or “disease”. The reason for this appears to be mainly historical. The second Law was originally formulated in terms of the usefulness of energy (Thompson, 1852) at a time when technology was driving the industrial revolution and the theory of evolution and natural selection was being developed within biology. The concept of entropy was subsequently reformulated in terms of heat (Clausius, 1865), probability (Boltzmann, 1872), and the arrow of time (Eddington, 1928). More recently, Claude Shannon, while working in the Bell laboratory on the engineering problems of communication channels, derived a mathematical expression for information that was subsequently shown to be identical to thermodynamic entropy (Shannon & Weaver, 1949).

Information and Entropy

In the introduction to Shannon’s work entitled “The Mathematical Theory of Communication”, Warren Weaver (1949) states;

When one meets the concept of entropy in communication theory, he has a right to be rather excited- a right to suspect that one has a hold of something that may turn out to be basic and important. . . One must think a long time, and consider many applications, before he fully realises how powerful and general this amazingly compact theorem really is. (Shannon & Weaver, 1949, p. 13)

Shannon’s equation, which equates entropy ($S(Q/X)$) with uncertainty, is defined in terms of a well-defined question (Q) representing a question with a finite set of answers, along with knowledge (X), based on knowledge of the question and past experience. This knowledge leads to the assignment of probabilities (p) to the various possible answers. Where K refers to an arbitrary scale factor Shannon’s equation is written as:

$$S(Q/X) = -K \sum p \ln p$$

Shannon’s expression, which forms the mathematical basis for all types of communication, neatly defines entropy in terms of *uncertainty* or *information* and reveals that information may be considered a form of energy that can be measured in terms of *bits* or *Joules per degree Kelvin* (one bit is approximately equal to 1.8×10^{-23} Joules per degree Kelvin) (Tribus & McIrvine, 1971).

In relating information and energy, this expression provides a link between qualitative and quantitative aspects of energy and amplifies the parallel between Qi and information. Shannon’s equation can therefore be applied to living systems by considering any situation as posing the question: “What is the most appropriate response to maintain homeostasis?” Organisms can then be seen to

use both genetic and acquired knowledge to respond in accordance with minimum uncertainty or entropy. In this view, pain, disease and the adverse effects of ageing can be seen to be related to the increase in entropy associated with isolated systems, while wellness is achieved by maximising flow and minimising entropy production.

Wellness and Minimum Entropy Production

In his now classic monograph “What Is Life?” Erwin Schrödinger considers the relationship between thermodynamics and biology and concludes that, for living organisms, a state of maximum entropy means death. He then suggests that to build up order and to grow, learn and evolve, living systems must feed on “negative entropy” (Schrödinger, 1944).

Living systems must exploit entropy gradients and are challenged with extracting low entropy from the environment and channelling the flow of “negentropy” to achieve their “purpose” while dissipating entropy back to the environment. While the purpose of life is generally thought to be survival and procreation, when viewed from an informational perspective, life’s purpose can be reframed to include both the biological goal of achieving homeostasis and the psychological goal of experiencing bliss, both of which can be seen to involve maximising flow and minimising entropy production.

Psychological Flow

From a psychological perspective the notion of bliss and the idea of maximum flow and minimum entropy can be related to the flow of information, or “stream of consciousness”, as described by the notion of “psychological flow”. The concept of *flow* has been developed by Csikszentmihalyi (1990), who describes the state of flow as “a joyous, self-forgetful involvement through concentration, which in turn is made possible by a discipline of the body” (p. 105). The state of flow is achieved when perceived challenges exactly match perceived capacity thereby creating complete congruence between internal and external states.

The flow state encompasses the whole of consciousness and requires the integrated action of both physiological and psychological processes. In requiring wholeness, flow is aligned with health and wellness and is seen to engender positive feelings that include:

- Being completely involved in what we are doing – focused, concentrated
- A sense of ecstasy – of being outside everyday reality
- Great inner clarity – knowing what needs to be done and how well we are doing (feedback)
- Knowing the activity is doable – that our skills are adequate to the task
- A sense of serenity – no worries about oneself, and a feeling of growing beyond the boundaries of the ego

- Timelessness – thoroughly focused on the present, hours seem to pass by in minutes
- Intrinsic motivation – whatever produces flow becomes its own reward (Csikszentmihalyi, 2004)

The ability of organisms to channel the flow of matter, energy and information is inherently challenged by the dimensions of space and time; however, flow can be maximised and entropy production minimised by addressing challenges that invoke character strengths and matching challenges to individual capacity. Psychological flow can also be enhanced in any situation through the practice of “mindfulness”, which aims to expand conscious awareness in any present moment. Similarly, alignment between an individual’s character strengths, life’s purpose and lifestyle activities is likely to provide the greatest flow throughout the lifespan and afford the healthiest lifestyle.

Wellness, Communication and Open Systems

Entropy is associated with isolated systems, the passage of time, uncertainty and disorder. In contrast, the experience of flow involves dissolving the barriers between the self and the environment and is consistent with a state of minimum entropy that engenders timelessness, a sense of order and certainty and the state of bliss. This state is also consistent with the Eastern notion of enlightenment as being “at one with the universe” where there is no distinction between self and non-self, thus creating an open system that is not subject to entropy increases.

The idea that wellness and positive psychological states require “open systems” is recognised within common language with the idea of an “open heart” or “open mind”. Thus, while the enlightened state suggests an open and unimpeded stream of consciousness, the states of pain and disease imply an increase in entropy within isolated systems created by a disruption to the flow of matter, energy or information. Such disruption can be seen to apply at many levels with disorder arising from different types of obstructions, ranging from blocks in enzyme pathways and biochemical processes, to mechanical disruptions in arteries, veins, ureters, intestines or nerves, as well as blockages in emotional expression or thought processes creating a closed heart or closed mind. This analysis can be extended to the social and cultural domains where interpersonal and cultural conflicts restrict communication and result in social isolation, intolerance and violence.

It is ultimately information flow or communication that enables living systems at all levels of organization to retain a high degree of order. Thus, in ordered systems there is a transport of information from the environment to the most highly ordered structures and therefore a dissipation of entropy from the most highly ordered structures back to the environment. In this view, wellness represents the drive towards maximal flow and minimal entropy production, which then affords the greatest stability and resilience at any level of organization.

The ability of dissipative structures to remain stable and build up order is described by Prigogine and Stengers (1984) as a competition between stabilisation through communication and instability through fluctuations whereby: "The faster the communication takes place within a system, the greater the percentage of unsuccessful fluctuations and thus the more stable the system" (p. 187). To achieve stability, living systems must therefore employ sophisticated communication systems and remain open so that they continually consume negentropy from their environment.

This can be represented on the Illness-Wellness Vortex by viewing the vortex not as a static structure but as a dynamic structure. Thus, like a tornado or the swirling eddy created by the continual flow of water down a plug, living systems require a continual flow of matter, energy and information to maintain their structural and functional integrity. Furthermore, increasing this flow requires an increase in the order and complexity of the entire structure to sustain the required communication network necessary to maintain stability.

Consumption, Lifestyle and Entropy Production

Currently all life on earth is supported by negentropy from the sun, which drives global photosynthesis, while global entropy production is radiated back into space in the form of low level radiant heat. Within individual organisms, negentropy is consumed in the form of food and oxygen, while entropy is dissipated with radiant heat, expired CO₂ and through excretory processes. When viewed from the perspective of lifestyle, negentropy is related to positive experiences and is obtained through gainful employment and engaging with the social, natural and built environments as well as through consumer goods and services. Entropy on the other hand, is related to negative experiences and dissipated through physiological and psychological morbidity and adverse social and ecological impacts. In this view, wellness implies a life characterised by maximal enjoyment, engagement and productivity along with minimal morbidity, consumption and waste.

Lifestyle is ultimately fuelled by consumption and healthy lifestyles therefore require healthy consumption habits. Western lifestyles however, are currently based on habitual consumption of unhealthy quantities of alcohol, tobacco, salt, sugar, fat and animal products. These consumption patterns have now expanded across the globe to the point where they represent a threat to human health and survival. A 2005 report by the World Health Organization entitled "Preventing chronic disease: A vital investment", estimates that of the 58 million deaths in the world in 2005, 35 million (60%) were caused by chronic diseases such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, and suggests that the main modifiable risk factors for these diseases are related to lifestyles based on unhealthy diets, physical inactivity and tobacco use (World Health Organisation, 2005).

While lifestyles based on the consumption of alcohol, tobacco and unhealthy foods pose a threat to human health, consumption of fossil fuels for electricity production, the rearing of livestock and transportation may pose an even greater threat. The release of greenhouse gases such as CO₂ into the environment prevents the earth from dissipating low-level radiant heat and hence entropy into space. This makes the prospect of runaway climate change that could threaten the health of the earth's entire ecosystem a real possibility and makes the adoption of healthier and more sustainable lifestyles a global imperative.

Conscious Consumption and Global Communication

The requirement of living systems to consume negentropy and dissipate entropy makes it seem inevitable that life will always come at the 'cost' of degrading its environment. However, while life must necessarily dissipate entropy, living systems are able to minimise entropy production through coupling, whereby *order* is cycled and recycled (Ho, 2001). This occurs within individual living systems through biochemical pathways, as well as within ecosystems where order is transported up the food chain and ecological niches are created to recycle waste products and retain order within the ecosystem. Similar processes can be evoked within lifestyles through "conscious consumption" thereby reducing consumption and reusing and recycling resources to minimise entropy production.

The trend towards more conscious consumption is expounded by the LOHAS (Lifestyles of Health and Sustainability) movement, which aims to align consumption patterns with the values of health, the environment, social justice, personal development and sustainable living (www.lohas.com). The LOHAS movement promotes conscious consumption through trends such as "fair trade", "organics", "food miles", "carbon offsets" and others that increase information about consumer items and encourage greater transparency, equity, accountability, social responsibility and environmental sustainability. It is suggested that these conscious consumer trends can be integrated under the banner of "conshumanism" or "conscious and humane consumption" whereby consumers ask a range of questions about the products they are consuming such as:

- What is in it?
- Who made it?
- Who benefits from the purchase?
- Where did it come from?
- How did it get here?
- What is its lifecycle and embodied energy?
- What is its environmental and social impact?
- How useful is it?
- Is it worth the price?
- What are the alternatives?
- Is the product really necessary?

These questions draw attention to the utility along with the social, ecological and economic impact of consumer goods. In doing so they expand the analysis of healthy lifestyles beyond diet, exercise and calorific flow to considerations of the psychological, physiological, economic, social and ecological impact associated with different consumption patterns. As such, they promote the realisation that everyone is connected and one's own personal consumption habits and wellbeing is ultimately linked to the wellbeing of all, including the wellbeing of the biosphere and the biological systems in which we are embedded.

It is said that "the currency of wellness is connection" (Travis, 2007) and with the advent of information and communications technology (ICT) and the internet, the world is certainly becoming more connected. Over the past two decades the development of the internet and ICT has progressed so rapidly that computers and mobile devices infiltrate almost every aspect of society and any individual can access and contribute to a global network. Global communications have also facilitated an awareness that the planet's resources are limited and that all human activity contributes to global entropy production through the consumption of limited resources and production of pollution and waste such as CO₂ and other greenhouse gases.

Communication and evolution of global consciousness

While human activity necessarily contributes to global entropy, humans are also open systems that can defy the Second Law and create new order by transforming low-level order through creative processes. These processes, which drive both biological evolution and human innovation, are dependent on increasingly effective communication systems. This is evident within human evolution with the development from hunter-gatherer to agricultural, industrial and post-industrial eras being supported by the development of the spoken word, followed by writing, printing and electronic formats.

Rifkin (2010) suggests that in addition to facilitating more sophisticated lifestyles that support greater energy utilisation, enhanced communication also shapes consciousness and leads to expanding spheres of influence and greater empathy. Thus the progression from hunter-gatherer to agricultural, industrial and post-industrial eras has been paralleled by consciousness expanding from mythological to theological, philosophical and psychological paradigms and humans expanding their empathic embrace from their immediate family and tribe, to those with whom they share religious, national and ideological affiliations.

Based on these trends, Rifkin (2010) further suggests that the advent of distributed global communications is expanding consciousness to create a "biosphere consciousness" that can support an "empathic civilisation". Thus, for the first time in history, there is the possibility of empathy flourishing

on a global scale with human empathy extending not only to other humans, but also to the entire living planet. The idea of expanding empathy as a path to personal liberation was surmised by Einstein who stated:

A human being is part of the whole, called by us 'Universe'; a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest - a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and affection for a few persons nearest us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole nature in its beauty. Nobody is able to achieve this completely but striving for such achievement is, in itself, a part of the liberation and a foundation for inner security. (Einstein, 1950, p. 12)

The vision of empathy providing the basis for a new social order appears to be supported by conscious consumer trends and the growing realisation that quality of life and happiness are linked to mindfulness, empathy, creative pursuits, and connection with the natural and social environment. This vision is further supported by the emergence of the global wellness industry, which values experience, quality of life and interpersonal connection and involves endeavours such as wellness tourism, which is based on local inhabitants



The Australian Council for Health, Physical Education and Recreation Inc. (ACHPER) is a leading professional, association representing professionals working in the fields of health, physical education, human movement studies, sport, recreation, dance and community fitness. It is a member based, not for profit organisation with a highly credible national profile.

The Mission of the Council is to promote active and healthy living for all Australians and particularly to support educators and its members in the study and of its areas of interest.

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preserving and enhancing their natural and cultural environments and inviting others from around the globe to share positive experiences and celebrate geographical, cultural and bio-diversity.

Conclusion

Wellness is a holistic and multidisciplinary concept that represents a state of maximal resilience and enjoyment. Wellness is described in Eastern thought by universal cosmological principles that are reflected in Western thought by the laws of thermodynamics. These laws can be used to depict wellness as a state of maximal flow and minimal entropy production and this can be represented on an Illness-Wellness Vortex, which has the homeostatic set-point of bliss as its axis. This axis may be realized when the flow of matter energy and information is unimpeded and perfectly matched to the capacity of the channel to carry it. A healthy lifestyle is therefore one that aligns consumption habits with inner values and evokes character strengths to maintain the greatest possible flow while producing minimal entropy.

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