

KENWYN K. SMITH

THE
ABUNDANCE-SCARCITY
PARADOX

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The Abundance-Scarcity Paradox
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*Dedicated to the memory of dear friends,
Douglas Lord, Gael McRae,
Leroy Wells and Corty Cammann.*

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INTRODUCTION

As a young man, I wondered what life was like during the Renaissance. That era seemed so vibrant. Outmoded traditions collapsed. New vistas emerged. People developed fresh dreams. Dying embers sparked refining fires. Decaying political structures slipped into history's archives. Reality became grounded in the substantial, and humanity's intellectual powers exploded. However, this shift took a long time, for communal rebirthing of this magnitude requires generations to gestate.

I now realize we know a lot about reconstructing society, for we are partway through an equally monumental period. Renewal on this scale is both taxing and exciting. Nations vibrate with fresh growing pains. New complexities stimulate nostalgia for simpler days. Global wealth and the numbers locked in impoverished contexts grow exponentially. Despair and hope spawn poison arrows and skyrocketing aspirations, so each step has to be taken with cautious courage.

Something special has been occurring since a young Albert Einstein¹ penned on a piece of paper $E = mc^2$. A century later, we are discovering how to "hold Infinity in the palm of the hand and Eternity in an hour."² Some tentative shapes of this epoch have begun to emerge, as concepts like quantum, ecological thinking, collective consciousness, synchronicity, holograms, fractals, nanotechnology, strange attractors, and DNA have entered everyday language.

The future is full of unknowns. It has already acquired a life of its own, which may cause us to rise or fall. How we handle the tumult will determine if this is a new dawn or an elongated darkness.

Although we are shaping and being shaped by these transitions, we may never know the impact of our actions. Posterity will decipher what resulted from our fortitude and our oversight, our longings and our patience.

Many new intellectual and societal pillars are currently being built into the foundation of our shared lives. This book focuses on just one, that *all of life is predicated on abundance*.

This assertion is made even though the global world order is being built on an economic system that is based on scarcity. It seems inconceivable that scarcity could be an adequate scaffold to support such complexity. Presently, money can be made only when there is genuine or artificially induced scarcity. For example, when water was freely available, it was assigned no economic value, but as streams got polluted, it became easy to sell water. As we grew afraid of the liquid gushing out of urban faucets, many of us began to buy bottled water, even though it often has as many impurities and tastes no better than what a municipality supplies.³ Also, a liter of water in a plastic container costs more than the equivalent amount of fuel that has to be extracted from the earth and refined!

It is time to build a form of economics centered on abundance. Because almost everything rests on the established monetary system, this will have to be implemented gradually, however, for chaos would reign if the present financial structures were suddenly discarded and replaced.

Before we can create the new economics, we need to collectively understand what abundance means. Since humanity has the scarcity paradigm well internalized, I propose that we begin by practicing the art of describing everyday events using the abundance paradigm instead of over-chronicling our misfortunes. This book is a starting point in this reconstruction process.

RENEWAL

It is springtime. As buds burst into bloom and birds rehearse the season's symphony, humanity awakens again to new possibilities. With nature's rebirthings, we are reminded that *the world is an abundant place*. Everything we truly need is available to us now, if we can access it.

We live in a world of abundance! I wish I could believe that. An inner voice protests. "Open your eyes! Look at the hungry children, breadwinners losing their jobs, long lines of refugees fleeing famine, broken economic systems, and political oppression. Scarcity is everywhere. Where is the abundance?" Another voice replies, "We are bombarded so often by images of scarcity the bountifulness surrounding us is all but impossible to recognize."

Like breathing, abundance is so close we tend to overlook it. For example, at day's end, we are presented with nature's most restorative gift, sleep. Even if we lie awake longing for more joy, more resilience, more anything, such images of the plentiful indicate that our sense of abundance is just below the surface. Then there are moments when its power is unmistakable, looking at vistas from a mountaintop, holding a newborn, watching the sun depart so other places can be warmed as we get the requisite respite from its everlasting intensity.

Although images of abundance fade during fallow times, they resurface when the over- and under-resourced claim our common destiny or when adversaries become allies. Even when there are shortages, we are sustained by a biology based on nature's lavishness. Also, we have minds that can participate in knowledge creation, can discern what we don't know, can recall the beauty of yesterdays' sunsets, and anticipate tomorrows' sunrises. "In the

depth of winter, I finally learned that there was in me an invincible summer,” said Camus on behalf of us all.⁴

It is our *belief in possibility* that makes possibility possible.

“Tread carefully when it comes to beliefs, privilege reality!” This thought is always with me. As a person who reveres the verifiable, I have no desire to heed the distorted sounds reverberating in the hollow echo chambers of the mind. Every part of me wants to be connected to the essential. However, a part of me also recognizes that our collective belief in scarcity contributes to the very scarcity we wish to banish.

I came to recognize the presence of abundance during the early days of the HIV/AIDS crisis. This was a strange context to make such a discovery because everything about that devastating era oozed scarcity. We became aware of AIDS in the 1980s when people were dying from a completely unknown disease. What an awful dose of scarcity, death, and zero knowledge of its cause! No one knew how it was transmitted, and there was no cure! Many feared it was carried by insects or was seeping out of buildings’ heating and cooling ducts. When we realized that people were dying due to the malnutrition caused by HIV/AIDS, a small group of us started a nonprofit, Metropolitan AIDS Neighborhood Nutrition Alliance (MANNA). Our goal was to ensure that every person in Philadelphia living with HIV had the right, tailor-made nutritional support needed to sustain them during their decline. This was our way of expressing concern for our community members who were being shunned by society.

I served as chair of MANNA’s board for the first several years and wrote a book about our experiences.⁵ It was subtitled *Ten Lessons in Abundance*. Here is a sample of the findings that stunned and uplifted us: whenever we were lost, someone appeared to show

us the way; the greatest insights came from the most vulnerable in our midst; MANNA's strengths were its vulnerabilities, and its vulnerabilities were its strengths; love grows when given away; the miraculous is contained within the mundane.

WHAT IS ABUNDANCE?

Abundance is a way of seeing, a method of thinking, a form of emoting and a manner of intuiting. So is scarcity, which thrives when abundance is impeded. Abundance and scarcity exist in nature. They also apply to human happenings. We tend to think of scarcity as shortages and abundance as being awash in excesses. These notions are reconceptualized in this book.

While things may be deemed scarce or abundant, neither is an absolute. Both scarcity and abundance vary along continua. Sometimes an extreme amount of each is used to anchor a scale's end. That works for something quantifiable, like a harvest that falls somewhere between dreadful and great, where both are treated as opposites. Another perspective is that, although they may appear to be antithetical, each is present within the other. In this sense they are parts of a duo as with *yes* and *no*, or *light* and *dark*. If we have never experienced the dark, we would always be in the light but never know we are in the light. Or if we are only ever in the dark, we could not imagine light. We would be enshrined in darkness but not be aware of it.⁶ Likewise, without scarcity, it would not be possible to construct the concept of abundance, and vice versa.

Since we generally know what we lack, scarcity is easy to identify. However, abundance is more complex. Often, the less we need, the larger the proportion of our necessities that can be met. Or those wanting to be more informed, more influential, or more

anything come to discover that as with pruning a garden, limits can facilitate growth. Also, too much abundance, too many options, can be as problematic as few possibilities, for unbounded systems can easily become either excessively expansive or overly constricted!

Scarcity is established by examining the relationship between what exists and what we think we need.⁷ This is concrete and easy to verify. Using similar thinking, having more than enough would be deemed as a definition of abundance. However, a more important form of bountifulness is the *untapped possibility waiting to be activated*. This kind of abundance moves the emphasis from the existent to the emergent. But it is difficult to assess because it involves accessing the unseen, imagining what could be, or releasing what has yet to become manifest.

Peter Diamandis and Steven Kotler, in their book titled *Abundance*,⁸ offer a classic image of scarcity. It is a person having to scrape just to survive. They do not imply that abundance is basking in excess. Their definition of abundance is having “a life predicated on *doing things that are fulfilling and inwardly meaningful*” (emphasis mine). Abundance involves balancing consumption and replenishment, decay and regeneration, expired pasts and future dreams. This view of abundance also recognizes the value of restrictions. Like a pregnancy approaching full term, scarcity shows the virtue of moving beyond a confining space and entering a landscape of what is to be.

I will illustrate the everyday meanings of abundance and scarcity by drawing upon the thoughts formulated by Diamandis and Kotler plus Sendhil Mullainathan and Eldar Shafir’s text, titled *Scarcity*.⁹ *Abundance* presents a logic based on innovations in science and technology developed by the Kurzweil Singularity community. It is awash with sociotechnical nuggets. Behavioral economists who

drew on social psychology and sociology wrote *Scarcity*.

I will first discuss the *Abundance* book that reports on two of humanity's major challenges, *water* and *energy*, both of which are integral to environmental viability. Second, I will address *Scarcity*, a psycho-philosophical approach to this concept at the heart of economics. I use these two texts as both a starting platform and as a point of departure.

WATER AND ENERGY

Water is essential for all living creatures. Eco-disasters result from too much or too little of it, floods, forest fires, droughts, or blizzards! In 2000, a billion people did not have access to clean drinking water and 2 billion were without adequate sanitation systems.¹⁰ While there is ample water on our planet, 97.5 percent of it is in the oceans, 2 percent is in the polar ice caps, and 0.5 percent is on land.¹¹ The issue is not lack of water but its saltiness and location. Demands on earth's water exceed supply, given our priorities. For example, 100 gallons of water are consumed producing a single egg, or one watermelon, or a flagon of wine. Beef sufficient for a family meal requires 2,500 gallons. The bottled-water industry annually draws 10 billion gallons from aquifers that took nature thousands of years to fill.¹² The rural sector is impacted the most. Eighty-five percent of people with insufficient clean drinking water live on farms, and 2 million children living in rural areas die each year due to dirty water.¹³

However, technologies already exist that can correct this water imbalance. These three breakthroughs illustrate how this problem is being addressed. First, a filtration system with a one-nanometer aperture (i.e., a billionth of a meter) has been invented, which can

filter out bacteria, salt, parasites, viruses, and arsenic. This makes possible desalination, requiring minimal energy.¹⁴ Second, several nanotech innovations are changing the water landscape, such as self-cleaning plumbing devices that prevent corrosion and automatically repair pipes, along with a thin layer of nano-based hydrophobic sand under desert topsoil, which can reduce water losses by 75 percent. Also, modern refrigerators are reducing by 50 percent the loss of fresh produce, are removing inefficiencies in the food supply chain, and are shrinking water usage by 35 percent per person.¹⁵ Third is the change in sanitation, with high-tech toilets able to cremate feces, evaporate urine, sterilize bodily secretions, and convert biowaste into chemicals, fertilizer, and energy.¹⁶

These changes require new energy systems. For decades, each person has used at least a couple of kilowatt-hours per day to deal with just the basics. Multiply this by the world's population and combine it with what is used by business, transportation, public works, etc.—the amount of natural resources needed to sustain the world is gigantic.¹⁷ However, humanity has come a long way. This is obvious if we calculate the hours of work it takes to acquire some thing.¹⁸ Thirty-five hundred years ago in the oil lantern era, an hour of lighting cost 50 hours of labor. The equivalent is now about a second of a worker's wage, a 100,000-fold savings. A stagecoach trip in the 19th century took two weeks and a month's wages. That trip is now done by plane in two hours, with the cost being one day of a middle-incomer's earnings.¹⁹ Yet there are still 1.5 billion people without access to electricity, making it very hard for them to get clean water, an essential for maintaining health. Energy, water, poverty, and health are mutually reinforcing. To resolve such problems, the interdependencies among them have to be addressed.²⁰

We know that solar energy is the answer to so many difficulties, because it is plentiful and does not deplete anything. The energy reaching the North African deserts alone is 40 times the world's current electricity supply.²¹ In a single hour, more energy from sunlight lands on the earth than a year's supply of fossil fuel. That is 8,000 times what is needed to run the world in its current condition and several hundred times what is required to sustain 10 billion people. Solar technology is also scalable. If its use increases at current rates, 100 percent penetration will be reached in the 2030s, and by 2050, humanity will have 10 times the amount of energy we need.²² Even if only a fraction of this is realized, the possibilities are astonishing.

Establishing efficient ways to distribute energy has been hard but that is changing. Using the WWW as a model, the Enernet is set up to function as a smart grid facilitating the exchange of power between multiple producers and consumers. As with logging on and off the Internet, the Enernet can receive and store energy and data about power in many places, cars, factories, appliances, etc., at all points along the energy production-distribution-consumption supply chain. However, this is a holographic rather than a chain structure.²³ The Internet has a few billion devices with IP addresses, but the Enernet's interconnections are much larger.²⁴

Solar energy tied to desalination will help greatly, as large amounts of low-cost energy propel filtration systems and transfer it from the oceans to places in need of water.

This is a moment to acknowledge that everything we are and have comes from our ecosystems. Our very existence and vitality is a product of nature's energies. We are warmed by the sun and cooled by the breezes coming from lakes, oceans, or mountain peaks. Our food is the product of endless interactions among soil, rain,

seedlings, and trillions of micro-critters. Then there are those remarkable processes like photosynthesis and genetics!

SCARCITY

Mullainathan and Shafir define scarcity as **not having enough of what we feel we need**. They illustrate by explaining how malnutrition alters bodily organs, especially the brain. As one's body weakens, the mind loses its capacity to multitask and only attends to the most glaring biological needs. For example, a thirsty or hungry person respectively notices referents to *water* or *food* above everything else. However, at the time, those experiencing such a deprivation rarely notice this propensity. To restore themselves, underfed people need to gradually consume small and balanced amounts of carbohydrates and proteins.²⁵

Mullainathan and Shafir characterize economics as the “use of limited means to achieve unlimited desires”—that is, naturally occurring or artificially manufactured scarcity is in the core of this discipline. Even imagining a shortage might occur leads us to act as if that deprivation already exists, as is clear when we fear for our safety. Even in safe environments, mere thoughts about danger produce the bodily, cognitive, and affective responses associated with threat.²⁶ **Scarcity's biggest impact is upon our thinking. It can increase our attentiveness and competence, or it can shrink what we see and prevent important thoughts from even entering our minds.**²⁷

Scarcity leads people to make **trade-offs or fast decisions that can have a positive or a negative outcome.**²⁸ A scarcity such as a tight timeline can increase output. The authors refer to this as a *focus dividend*. When scarcity lowers output, those workers are described as **trapped by tunnel vision.**²⁹ A mind gripped by scarcity may lead

to tunneling or dividends. The conditions are the same for both, so what leads to good outcomes? *Focus dividends* are likely when the key issues are accurately established. *Tunneling* occurs when a single issue is pulled from a set of equally critical considerations and made the sole focus.³⁰

It is easy to slip into a scarcity mindset, which draws our attention from other important concerns. That generates secondary and then tertiary scarcities. The authors call this a *bandwidth tax*. What is taxed? It is a person's capacity.³¹ If energy in one part of a person's life is used to compensate for other deficits, things get off-kilter. When financial burdens are fused with time shortages, the bandwidth tax increases because each fear generates another fear.³²

These authors claim that scarcity reduces bandwidth directly rather than injuring people's cognitions. While a person's behavior may look like a cognitive weakness, these economists claim that the source of the scarcity is the context, not the person displaying the deficiency.³³ If a poor performance is not due to an individual's actions, any attempt to fix the person will fail because it is the setting that needs to be repaired. It is easy to make judgments about a person's skills and not see the complexities that individual must manage. A bandwidth crunch tends to occur when work and personal crises collide. Hence, employees who all perform well are not comparable if they have different economic circumstances. The better workers are those who are overtaxed by scarcity's burdens. They are likely to have hidden adaptive skills, greater resilience, and more empathy for others. Since scarcity normally shrinks bandwidth, someone with little slack who is highly productive is probably an unrecognized superstar.³⁴

CHAPTER 1

SEEING WITHOUT EYES

Can we *see* abundance and scarcity? That is the theme of this chapter. On the surface, this might appear to be a trivial query. But it is more complicated than meets the eye.

Scarcity is evident when stores sit empty in advance of a hurricane or if water is rationed during a drought. Likewise, nature's abundance is on full display at harvest time or upon being drenched by a monsoonal downpour. However, even amidst great lack, images of the plentiful are present. They are tucked inside our expectations that once the tempest's carnage is cleaned up fresh produce stands will be restocked and that water restrictions will end when the wet season arrives. Similarly, summer's bountifulness is a sharp contrast with winter's lifelessness. Strangely, scarcity and abundance seem meaningful only when set side by side. Certainly, these concepts are so linked in our minds it is hard to define one without evoking the other. **When abundance is not visible, it is often hidden under scarcity's shroud.** And the converse!

Then there are marvels we never see directly, like photosynthesis or radio waves. We notice their effects when eating fresh fruits or searching for a channel playing our favorite music. Also, there are things like the invisible ozone layer, which shields earth from the sun's harmful ultraviolet radiation but enters our awareness only when increasing numbers of skin-cancer patients suggest a new ozone hole has formed. While we have indicators

about photosynthesis, radio waves, and the ozone, we do not have senses that can see them directly.

Since sight determines much of what we understand, it is beneficial to know its strengths and weaknesses. While our visual capabilities are impressive, they have major limitations. Of course, we do have technological instruments that provide information about things we cannot see. And we share this planet with creatures that have very different sensory capacities. So, it is wise to also absorb the ways they experience our shared surrounds. While there are advantages to using multiple sensory systems and devices, they also produce perspectives that often appear contradictory. That means we need good cognitive skills to sort out the primal and the peripheral.

My interest in the abundance-scarcity symbiosis began when I met Maco, a blind student. So, I will begin our foray into this topic by describing our first encounter. Once the intellectual dust stirred up by his story has settled, I will begin to explore a theme being threaded throughout this book. It is how the seen, the unseen, and the things yet to come into existence shape our understanding of scarcity and abundance. This chapter will end with some insights on this topic conveyed by *Taoism*, which was developed long ago by brilliant Chinese scholars.

SENSING ABUNDANCE

Leaning his cane on the doorjamb of my Melbourne University office, Maco walked toward me, hand outstretched and his eye sockets pointing to the ceiling. After exchanging pleasantries, Maco, one of a 100 students in a course I was teaching, asked if he could skip all my lectures. Many students miss an occasional class, but

never had anyone announced in advance his intent to always be absent! He sought my approval to have my lectures recorded, claiming this would help him greatly, saying, “I can get through an hour of you in 15 minutes!” This quip piqued my curiosity. Responding to my surprise, Maco said he speed listened, something still unknown to me.

Wanting to *see* if his claim was valid, I asked him to lend me his recorder, leave, and return in 30 minutes. Pulling an obscure book from my shelf, I read into his machine. Upon his return, Maco pressed his magic button. My voice sounded like a hyperactive cartoon character. While to me all my words sounded garbled, his comprehension of this unfamiliar passage was nearly perfect. He had 90 percent verbal accuracy. I could follow along as Maco recited what I had dictated. Occasionally he skipped a few phrases or reversed the first and last sentences of a paragraph, but overall, his recall was astonishing. I thought I had *seen* everything as an educator. Shaking my head, I mumbled, “Maco, let’s change roles. You teacher, me student! How did you do that?”

Maco’s belly laugh filled the room. “You people with eyes have a problem! You can’t see! Granted, eyes help. And when I was young, I wished I had them. But they also limit your vision. Eyes notice what they can take in but ignore what they can’t process.”

Cold sweat gathered in the small of my back. Never had I contemplated how our vision registered a fragment of the data and treated it as the totality. Enamored by what eyes enable, I had completely ignored what they overlooked or obscured.

Maco asked me to do something. I scratched my left ear and rotated my right foot.

“You just rubbed your ear and wiggled your foot,” he said.

Stymied by the incongruity of a blind man making such astute observations, I asked Maco, “How did you figure that out? How can you see without eyes?”

“We have many senses,” Maco began. “Each can inform us of what the eye misses. There are lots of other cues, sounds, odors, air movements, and temperature differentials, which most people don’t register. If you lost your sight, you too would develop new ways to see.”

Maco rarely attended class, but he regularly came by my office. We discussed many things, but our chats invariably converged on two themes. First was his conviction that the world is filled with shapes, lines, curves, and angles we do not access because we lack the senses and the cognitive acumen to register them. Second was his contention that his sensorium was superior to mine.

A favorite statement of R. D. Laing, the renowned Scottish psychiatrist, was effectively Maco’s mantra: “*What* one *sees* depends on *how* one sees!”¹ Our sensing mechanisms involve many processes. For starters, what we see is shaped by the lenses we look through, the vantage point from which we inspect the world and the predefined contours of the mind into which we map our perceptions.² If we change goggles, the parapet from which we peer, or our cognitive apparatus, the data absorbed alters. A similar statement could be made about hearing, touching, smelling, and tasting, senses Maco skillfully used. But not me, which he thought was problematic! He relentlessly asserted that our sensory equipment and our brains have to be carefully honed and properly aligned. He also insisted that for me to access and comprehend the full range of olfactory, tactile, tasting, and auditory sensations, I would need to develop a more advanced set of mental grids!

Maco and I made a brief visit to the studies on perception of that era. Here are a few of the basics from decades ago, which grabbed our attention during the months of our relatedness.

Every creature's sensory equipment shapes its experiences. A person may be attracted by a flower's colorfulness. Bees may be drawn to its pollen. A bat may treat it as an echo of ultrasound.

How a locale is to be used often defines how it is sensed. For fish, a lake is a habitat. For deer, it is a source of drinking water. For canoeists, it is a place to paddle.

What the world is like depends on the brain's early imprinting. Animal trainers know that tethering a baby elephant to a sapling with a thin twine makes it feel secure. When fully grown, if that elephant is chained to a large tree, it can easily uproot the trunk. But if it is attached to a sapling by string, it will not even try to escape. In maturity, it will stay within the cognitive parameters established during infancy.³ Similarly, if kittens spend their early weeks in a box with only horizontal black-and-white stripes and no vertical lines, upon maturation they will bump into upright objects like poles. Those raised in cages with solely black-and-white vertical markings manage furniture legs fine but not horizontal surfaces like ledges and countertops.⁴

We trim the world to fit our ways of knowing. If we examine a landscape with one eye, we see it in two-dimensional terms. A second eye makes depth perception possible. What might we see if we had a third, a fourth, or a fifth eye? And what happens when making a two-eyed inspection of reality that needs eight eyes to see properly? Will we misconstrue everything? Or collapse all multidimensional images into three and fail to recognize the others?⁵

Maco's tutelage was enchanting. Being sightless had not sentenced him to a life of sensory deprivation. He urged me to expand my horizons, to recalibrate my sensorium. His view was I manufactured my own scarcity mindset by not making full use of all the sensory tools nature had given me. It was not science, philosophy, or psychology that led me to see that I had loads of unused sensing, thinking, feeling, and intuiting talents. It was a blind student. His message? Not only do we live upon a goldmine called Mother Earth. We are our own unique, unseen goldmine!

A HUMBLING REALIZATION

Every species has a unique sensorium. However, compared with other creatures occupying these same environs, our senses are relatively underdeveloped.

Human vision operates in a 400-to-700-nanometer range of the electromagnetic spectrum. That is a small slice of a continuum extending from the gamma ray pole that is trillions of times shorter than ours through to the radio wave pole, which is trillions of times longer. Each creature with visual capacities has its own segment, either above or below ours. A good example is the butterfly that locates nectar in flowers using ultraviolet light and hence can notice many colors we never see.⁶

We hear sounds in the 20-to-22,000-hertz (cycles of air compression per second) range. There are creatures that hear well below us, like elephants bellowing messages to herd members at a very deep level.⁷ In the forest, we may hear an occasional note of a bird's song, of a frog's tuba solo, of a cicada concerto. But we miss the notes in their symphonic and operatic performances that are at higher and lower levels. Some insects, like male treehoppers, vibrate

their abdomens and use sensors on their legs to chat with mates, to attract females, or to scare off predators.⁸ Crickets can create chirps by speedily rubbing together their wings that are tailor-made for their own species. For example, the 140 groups of North American crickets have their own sonic niches, a uniquely designated frequency like a radio station.⁹ I am in awe of the music composed by geniuses, the instruments created by craftspeople, the skills honed by musicians who are constantly rehearsing. But what they play in grand halls is no match for the impromptu recitals performed in nature's music chambers every day by oodles of creatures without a musical score or a conductor.

We humans live within the earth's magnet fields, have scientific knowledge of electromagnetism, can read a compass indicating true north, and can effortlessly switch on an electric light. But we are not aware of sensing these energy systems directly. However, many birds use electromagnetic currents as their GPS, as their guide during annual long-distance migrations.¹⁰

Our olfactory senses are also very limited. However, all around us are organisms like ants and bacteria that use smell and taste to locate nutrients or to spot adversaries.¹¹ Ninety-nine percent of all species encounter the environment and communicate via odors conveyed through chemicals (pheromones, allomones, kairomones). Some scents carry intraspecies messages. Others repel antagonists.¹² These compounds are usually aimed at specific compatriots. For example, the scent of sex-seeking female moths can reach males from a distance of a kilometer. On a human scale, that is like Romeo and Juliet sending come-hither pleas from 50 miles away.¹³ Ants guarding their nest can quickly activate their warriors by releasing specific odors.¹⁴ Insects seem to be among the operators of nature's Internet that have explicit species-centered IP addresses, passwords,



and a social-media-like capability accessible to those bonded by kinship. It is remarkable how abundant the collective sensing systems of all creatures are, despite the limitations of each individual species' sensorium.

This is the irony of sensory skills. Humans' sensing systems are inferior to most species', but we have greater cognitive skills. Other creatures have more sensory capability but less mental capacity. Nevertheless, humans are sustained by many of these creatures, who source our food, convert it into nutrients, clean out our stomachs after a meal, and degrade what is sent to a bio-dump.

In addition, just imagine how much abundance there might be out there in some unknown reality that no creature has even been able to sense!

SENSORY CONTRADICTIONS

When information is gathered via the multiple senses of many creatures, the disparate findings need to be integrated in order for meaning to be created out of them. This synthesizing is difficult if the data is discordant, which is certain to be the case if truly dissimilar sources have been accessed using multiple methods to gather information. In the scientific realm, this is known as *reliability* and *validity*. If there are large incompatibilities in the data, then judgments need to be made about which bits of evidence are more correct, more actionable, and more useful. That leads into territory known by a variety of names, digitalizing, duality, polarization, and either/or thinking. This arena is fraught with many complications. One of the trickiest is well illustrated by the apocryphal story of the master and the apprentice who are sitting on the riverbank.

Breaking a long meditative silence, the master asks the apprentice, “Is this the same river or a different river from the one that was flowing by here yesterday?”

Realizing that water had gushed through these gorges for eons, the novice spontaneously replies, “It is the same river!”

“Are you sure?”

Following a respectful pause, this puzzled pupil says, “Since these molecules have never passed by here before, it must be a different river.”

“Are you sure?” the master asks again.

They both return to their contemplative quietude. Hours later, the apprentice exclaims, “Ah, I *see*! It is *both* the same river *and* a different river. Water has always flowed by here but never this particular set of molecules. Its sameness makes it unique. Its uniqueness makes it the same. Because it is ever changing, it is the same. Because it is always the same, it is different!”

For our purposes, there are two lessons to be taken from this tale.

First, an either/or lens focuses vision, pulling sight into narrow tunnels. It increases a sense of scarcity. Both/and seeing, which by definition includes either/or vision, has a wider-angle lens. It can capture the focused-upon *and* the peripherals. It is an abundance amplifier.

Second, is our propensity to look through an either/or lens, a both/and lens, or both? Images alter when we switch from one to the other. Later we will explore the cognitive aspects of either/or and both/and reasoning. For now, the issue is whether we are aware of using either or both of these spectacles. And in particular, if the pictures generated by these different lenses clash, do we categorize them as two contradictory opposites, like agree and disagree or right and wrong? Or do we treat each as being embedded in its opposite?

Several things change when looking with a both/and versus an either/or perspective: (1) the picture alters; (2) the focus becomes primarily the relationships between the things that seem contradictory; (3) observers are forced to look at and into the empty spaces between interacting entities as well as the behaviors of the inter-actors; (4) the links between observations and the ways we traditionally represent those observations are reshaped; and (5) the patterns created by the interactions among the creatures, objects or concepts become the most important things to inspect.

SEEING PATTERNS

How do we see the patterns undergirding relationships? Looking at a rock or smelling a rose is simple compared with sensing patterns. For example, it is not possible to actually see the interactions between the sun, the soil, the rains, and a paddock's crop yield. But over time, a farmer makes a map of the relations among such variables and can identify when they are in or out of alignment. Or a psychologist helping a couple rebuild a broken relationship will recognize the significance of *what the duo is **not** saying, what is **not** occurring* in their interactions. The absences often are more relevant than the words spoken or the actions taken. While other observers may not notice these patterns, competent professionals operating off robust theories about humans' or nature's functioning can discern them. This is a specialist art, seeing the relationships between what is observably happening and what could be occurring but is not.

A perfect exemplar of using the either/or and the both/and lenses and of seeing patterns is the well-known concept of *yin* and *yang*, found in the Chinese literatures written 2,500 years ago. They use a

single image to represent these two processes. Later we will discuss the insights the *yin-yang* dynamic contributes to the abundance-scarcity dance.

Patients seeking help from practitioners of traditional Chinese medicine learn early on about *yin* and *yang*. The mere taking of the 12 pulses is a tactile indicator of the invisible *yin-yang* patterns occurring in the body's deep structures.

The *yin-yang* symbol refers to natural dualities, complementary forces like light and dark, life and death. *Yin* represents the earthy, darkness, negative, passivity, absorption, the north or shady side of a hill, the south of a river, the feminine. *Yang* signifies the heavenly, light, positive, activity, penetration, the south or sunny side of a hill, the north of a river, the masculine.¹⁵ As *yin* is in ascendancy, *yang* is receding, and vice versa. For ancient Chinese philosophers, the *yin-yang* pattern mirrors nature as a whole.¹⁶



Yin-yang, depicted above, is a circle consisting of two teardrop-shaped halves, one white, the other black. Nested within each is a miniature of the other, which implies that each part holds its opposite inside it, that neither exists without the other. The external circle symbolizes the undifferentiated *unity of all things*. The internal curves indicate the rising and falling waves of *yin* and *yang* adjusting to each other. Night becomes day; day becomes night. Birth becomes death; death becomes birth. Friends become enemies; enemies become friends. All things continuously surface and subside. The emergence of any *thing* is *yin* and its resolution into *non-thing* is *yang*.¹⁷ From *nothing* comes all *things*. In Chinese

thought, every *thing* and every *non-thing* is a cyclical playing out of the *yin-yang* dynamic,¹⁸ which is an indivisible whole. Accordingly, the attaching of labels like good and bad to *yin* or *yang* is meaningless.¹⁹

Yin and *yang* seem like opposites, such as polarities anchoring a dichotomous continuum or seasonal endings and beginnings. However, they are relational and relative. Water is *yin* compared to steam but is *yang* with respect to ice. *Yin* and *yang* are always rebalancing. For instance, a stone dropped in a calm waterhole produces elevated ripples and lowered troughs that radiate outward until they dissipate, leaving a glassy surface. While neither *yin* nor *yang* exist separate from the other, nothing is completely *yin* or *yang*. As extreme *yin* is approached, *yang* starts to grow. Relative *yin-yang* levels are forever realigning. Too much of one dislocates the other. However, altering from one to the other is ordered and occurs at the appropriate time. Winter yields to spring, never the reverse, but only after winter has run its course.²⁰

Both Western and Chinese logics affirm that the sense making happening on the surface indicates what is occurring within the manifest. This has been given a variety of names. Chomsky's term is *deep structure*.²¹ Maruyama names it *mutually causal processes*.²² Bohm considers it to be the *implicate order*.²³ Prigogine labels it *order through fluctuation*.²⁴ The Chinese call it *yin-yang*. All these scholars ask that we attend to the structural dynamics found *within* the manifest forms, even though the data is primarily accessible on the surface.

TIPPING POINTS AND YIN-YANG REGULATORS

I think we currently have only a hazy grasp of the *yin-yang-like* regulators that moderate the abundance-scarcity relationship. However, depending on the issue, this switching dynamic can be anything from a delicately poised, hair-trigger tipping point to a large form of oscillation. Three ecological examples provide approximate images of this equilibrating-adjusting process.

One is the typical predator-prey relationship, such as a territory inhabited by rabbits that are the prey for lynxes. When rabbits are plentiful, the lynx population increases but drops with the overconsumption of rabbits. As the number of rabbits shrinks, some lynxes begin to starve, which leads to a decline in their population, enabling the rabbit population to grow again. This concept, called *order through fluctuation*, is central to co-evolutionary thinking. The oscillation, while being deeply troubling for an individual rabbit, helps to create order at the macro level.²⁵ If an heroic rabbit wants to preserve the long-term survivability of its species, it has to decide whether to escape or to give itself up to be eaten. To make a smart choice, it would need to know what phase the rabbit-lynx oscillation is in, which vector is increasing or declining, which requires a *meta-perspective*. It is tough for a creature with only a worm's-eye view to get a bird's-eye perspective. Given its limited awareness, a rabbit will do what makes most sense. It will run. Fifty percent of these escapes contribute to the survivability of the rabbit species, but half the time, that act detracts from it. A lynx is in the same situation. Sometimes a lynx will aid the species by going on a starvation diet, whereas on other occasions, behaving glutinously is best.²⁶

When the rabbits-lynxes plight is applied to the human domain, we find the same issue, such as the supply-demand nexus, so critical for economic functioning. As all businesspeople know, a well-honed rheostat that harmonizes supply and demand can make or break an enterprise. In the short-term, it often seems important to restore equilibrium as quickly and smoothly as possible. Excessive fluctuation is usually seen as disturbing equilibrium and hence should be minimized. However, order can be destroyed if a system hovers close to equilibrium, whereas more extreme fluctuations around that fulcrum may be what are needed to sustain system vitality.²⁷

Ecological studies show a similar pattern between animals and vegetation. With the rise or fall of food resources, some animals, like red squirrels, adjust their procreative actions. Eighteen months before spruce-tree cones mature and drop, these squirrels can estimate the availability of food by noting changes in the taste between the reproductive and vegetative buds. This informs them when the food supply will be plentiful or limited, which leads them to adjust the number of offspring to have.²⁸

Across the ages, there has been a stark difference in how humans have conceptualized abundance and scarcity. Early Chinese scholars did not think of abundance as having plenty of everything and scarcity as lacking the things we need. The *Taoists* conceived of abundance as the harmonious movement of *yin* and *yang* in a mutually adjusting relatedness, with *all that is* and *all that is not* being in the core of everything. For them, scarcity was an expression of either *yin* or *yang* gaining so much dominance that the other got diminished, throwing everything *off-kilter*. For such thinkers, scarcity is too much *yin*, or inadequate *yang*, or a blockage of the

balancing process between them. That is a radical conceptualization to be explored later.

SUMMARY

We end this chapter with a threefold challenge: (1) how to see or measure energy flows among a system's elements; (2) which energies contribute to abundance and which logjams produce scarcity; and (3) how boundaries enabling or limiting flow contribute to the scarcity-abundance dynamic. This chapter addressed the following themes:

- Our sensorium can access only a small fragment of reality.
- The creatures around us sense things we never recognize.
- We can sense with both either/or and both/and modalities.
- Data produced by multiple senses often seem incongruent.
- Information that is conflicting is cognitively demanding.
- Abundance is about both what-is and what-might-be.
- Our senses are not equipped to tap into latent possibility.
- It is more difficult to see what is potentially emerging than what already exists.
- Abundance is found in the empty spaces between interacting entities.
- The abundance-scarcity dynamic is based on flow, balance, and realignment.

The above presumes we can trust what our senses detect. That is our next topic.