

INTRODUCTION

*We are drops,
Flowing as one river
Rising as mist
Floating as clouds
Sparkling as dew.
Remember.*

As an artist, activist, and teacher, my creative curiosity has focused on water for forty years. I have explored water from the interior of the drop to the systems that function as the veins of the earth. I seek to invite people to know their waters, to be in relationship with each other, and to work within and across communities worldwide to repair the living system. My journey with water has opened my body, mind, and heart to a vast interconnectedness of living in a watery world.

In my search to understand water, I've come across spiritual practices of protection and healing, engineering solutions both ancient and modern, thousands of chemicals, pollution, filters, and infinite means for wastewater treatment, but very little about how those H₂O molecules really function. Although this knowledge is embedded in ancient, Indigenous, and ayurvedic cultures, it is only recently that “Western” scientists are approaching answers to some of the more existential questions about water: How exactly does water create life? What is the connection between water quality and a dynamic ecosystem? Above all, what *is* water?

The recent scientific understanding of the complex interconnectedness of living systems is a 180-degree turn from the perspective that disconnection is more scientific, practical and economical,

and that we live in a dog-eat-dog world in which a straight river or straight line is seen as the perfect choice for control.

Most people know that water is three stages of the hydrologic cycle—the cycle through which water passes from clouds to precipitation and ice and back to clouds. But this does not begin to provide a real understanding of the profound function of water on earth and in the universe. Until I decided to pay attention to water, I was not conscious of how water forms and informs every detail of existence.

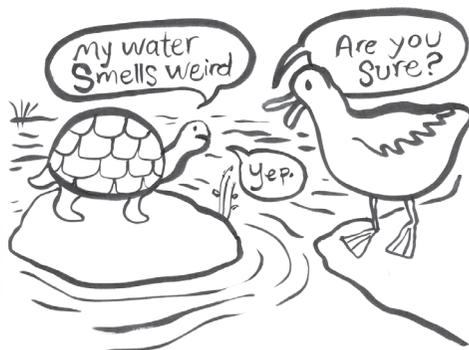
My country, the United States, is a resource-rich country, where



we use water as if it were an unlimited resource. For many people, water flows from taps; toilets flush, and bathtubs fill up with the turn of a faucet. Water has been provided with ease. Many people notice water only as a monthly bill, or when a pipe breaks.

Over my eighty years, I have witnessed the decline in quality of almost every body of water I've known. We've treated rivers and lakes as our dumping sites.

A vast and unregulated bottling industry has taken over, public water fountains have vanished, and water is now the new gold, being rapidly privatized. Simultaneously, the knowledge that water quality matters for all life has evaporated.



An aerial view of a river system closely resembles the veins and arteries of the human body. When speaking to an audience, I often

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ask: How many veins and arteries can be moved or removed from the body before it will die? We have moved and removed the veins of rivers to such an extent that whole water systems are rendered ineffective. Like our blood, rivers nourish and feed living systems. They cleanse and discharge unwanted substances. Like our veins and arteries, they don't work if they are overloaded with pollution, dammed too much, or transferred elsewhere.



Betsy Damon '95

Arteries and aerial view of a river system

Climate-related challenges, including increased tsunamis, hurricanes, tornadoes, and earthquakes, are impacting communities around the globe. Communities face problems ranging from too much water in the wrong place, to too little; from decaying and inadequate infrastructures, to dangerously polluted supplies. Every day, 150 to 200 species of plants, insects, birds, and mammals go extinct. Are there consequences to losing this biodiversity? Will it help to ensure that the water in which species thrive are not removed, drained, and polluted?

Natural forces—like meteors and earthquakes—have threatened life on earth for as long as it has existed. Earth has faced extinction events in the past. Yet this human-caused extinction event is unparalleled in its speed. One of the root causes of this mass extinction is damage to our life-sustaining water systems and forests.

Water science and technology have been vehicles of liberation and progress, providing benefits, especially in urban environments. Recently, we can effectively deliver water to millions of people, remove waste, and convert waste into byproducts. On the other hand, many natural water systems have been altered by dams, vast pipe systems, the destruction of wetlands and estuaries, and the transfer of water to supply cities. This, along with the extensive conversion of waterways into concrete ditches and pipes, has weakened the intrinsic resilience and flexibility of the earth's waters.

Ignoring water's essential role as the connective tissue of all life on Earth is widespread. Unfortunately, the response to each environmental problem tends to be piecemeal—addressing one threat rather than responding with the complex solutions that will address the underlying problems. For instance, a river that has been straightened and restrained between flood walls cannot respond adequately to rising waters, nor can it distribute its waters into the surrounding landscape. Contributing streams to that river have been funneled into pipes that dump the water into the already stressed river, thus increasing flooding while depriving the land of water. To date, most solutions have been to address a single purpose, rather than engage with nature's complexity.

Single-Purpose Design

Although there are many contributing factors, single-purpose design is one of the main roots of the water crisis and climate crisis. Single-purpose design treats all development situations similarly, without regard for what is best—only for what is efficient from a short-term monetary perspective. Single-purpose design solves one

problem without considering the impact on the surrounding land and ecosystems. An “efficient” design usually means easily controlled and disconnected from other systems.

Monsanto not only genetically engineers seeds; it also claims legal ownership of the seeds it has altered, leaving farmers to bear the burden of re-purchasing the rights to these seeds every year. This is a telling example of single-purpose design carried out to an extreme, threatening the very foundation of life.

Piecemeal responses to increasing climate chaos are enabled by the common misconception that there is little interconnectivity among parts of a complex system. Single-purpose design says: Slash all the trees, divide the land into parts, and build without regard for the land’s capacity to sustain development. This refusal to engage in complexity is also fueled by the notion that a “one size fits all” approach is the most economical.

“You cannot solve a problem with the thinking that created it.”

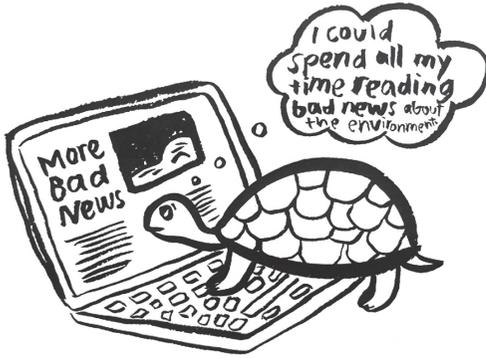
—ALBERT EINSTEIN

Water is the single enlivening element that we all depend on. We have boxed, dammed, and contained it. We must share this resource not only with each other but with all life. This consciousness gets lost when people hold water for personal gain. Finally, there are no national or international regulations to prevent companies and people from buying water sources anywhere in the world unless a country has decided to protect their waters. Throughout the world water sources are being bought and taken away from the places and peoples they have served throughout history.

Examples from our history reveal sharing and interdependence, not exploitation and isolation. In New Mexico, Indigenous tribes shared their water supplies in times of drought. I am sure there are many more similar cases.

We are a species that thrives in community, with vast interdependencies. Much of my early performance art required

collaboration, and was generated from the upwelling of the collective of women meeting in consciousness-raising groups and supporting each other. My performance work from 1977 to 1987 was



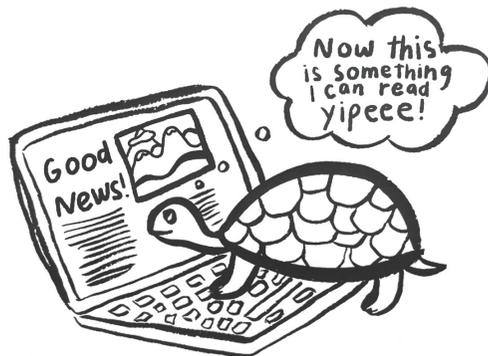
created by close-knit groups in workshop settings. I am forever grateful that I was supported by so many people, and that I got to support so many people. Bringing people together—as individuals, yet committed to a unified purpose—became my

model for projects. What does it mean to work in partnership with water instead of dominating it?

Our climate and water issues are a crisis of forgetting: We cannot take care of the foundation of life if we have forgotten that we exist because water is that foundation. More important, we can succeed only when communities, large and small, work together to restore interdependence, resilience, complexity, and flexibility to the earth's water systems and forests.

Water is self-regenerating when it's moving, when it's exposed to sun, air, and plant life and not overloaded with pollutants. Humans—you and I—also thrive moving in an alive world with sunlight and clean air.

Water offers us countless lessons for how to exist in complexity with each other. Water does not discriminate. It nourishes all life. Our communities are most innovative and powerful when everyone



is included. Diversity in community requires variety in many ways, including economic class, race, religion, skills, and knowledge. Complexity for water means that it moves through many varying situations: tumbling, bubbling, cruising slowly, eddying, living inside vast cavernous spaces, pouring out of a glacier and passing through reedy places, mangroves, and much more. Water does not naturally degrade; its degradation is a side effect of human negligence. It takes considerable effort to pollute a moving river or a large lake, just as it takes considerable effort to discourage the human spirit.

It is necessary that we have drinkable water and restore many systems soon. We must work on both the micro—our homes and communities—and the macro—the earth’s shared ponds, streams, rivers, estuaries, and wetlands. To accomplish this, we need to understand certain fundamental information about water. Much of the basics, along with organizing tools, are included in this book. I detail many of my organizing principles, as well as challenges and successes from my forty years working at the intersection of art, science, and community.

My knowledge is empirical. It comes from listening, looking, researching a particular place, asking questions, learning the necessary science for that location, trying projects, and inviting many to work together. Above all I am logical, and logic likes truth. There is so much we do that is not logical. Who thought that concrete on every river was desirable, or that straightening rivers was better? What species pollutes the source of life?

This book is a mixture of my passion to know water and learn from it, new and exciting scientific information, and fundamental issues and processes that can help every community reclaim its waters. We need to build a worldwide public knowledge of methods for engaging communities, building teams, mapping, and revitalizing vast portions of earth. Water is shouting her many messages. She is our verb, our call to action.

Water is a humble, most common liquid, upon which all life depends. It is the sculptor of all forms. We need it every day to be alive. We are inexplicably drawn to the watery places, the ocean's edge, lakes, streams, falls, and springs. We are water beings and every cell in our bodies is 70% water.

The chapters provide general headings in which examples of what is needed and why are set alongside the projects or parts of projects in which those skills are useful. Every chapter contains visuals, not only from projects, but also cartoons that concisely illustrate the kinds of concepts that usually require heavier research.

This introduction offers an overview of **Water as a Human Right**, the right to life, and looks at issues such as privatization and bottling, which are challenging the reality that all life needs water.

We continue with **My Water Story**, and I invite readers to remember their own story. The personal is political, and we all have our own adventures and experiences with water. Each chapter is centered on what I find to be the foundations of acting for and with water, beginning with **Listening**, which is the foundation of learning from and being with water and people.

I place **Art** as the central creative initiative that can inspire and educate. Why is this so? Art envisions, and artists can imagine the impossible. Artists can imagine beyond the restraints of a discipline. The discipline of art is to imagine and apply skills.

Next is **Community**. Everyone lives in a community, even if they don't realize it. Water is the connective tissue of our communities, seen or unseen. Our communities thrive on their waters. In this chapter, I present many practical processes to bring people together, including a sample workshop. These are to assist with your thinking as you get to know your own community.

Mapping—I discovered that mapping is perhaps the most valuable tool for everyone in a community to have a clear understanding of their waters, their watershed, and what they can do. Maps reveal all the details needed to get started.

Water Balance—this is possibly the least understood aspect of our waters among the public. How much water is actually available in a community without a transfer and without taking more than our fair share of a river, lake, or aquifer?

Designs for Complexity and Resilience—In reality, an efficient design is one that reduces carbon, recycles water and waste, and builds toward resilience. An efficient design addresses complexity. For example, during a flood stage, a flexible river has plenty of places to overflow into, such as ponds along the river, wetlands, and healthy floodplains. This chapter presents designs for both the micro and macro levels.

Conclusion—Can we come together and decide to create a resilient and balanced system, not overused or overburdened with too much pollution? Can we work toward a system that contains sufficient complexity, interconnected systems, and a diversity of plant and animal species? A system is flexible when it can consistently adapt to new conditions.

Water as a Human Right

Water is a human right.

Water is an earth right.

Water is the right to life.

The 1948 Universal Declaration of Human Rights states: “Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing.”¹ What we can determine from this declaration is that water is a right, not a commodity. All life forms need water to survive, yet the necessity of access and dependence on water are often taken for granted.

At this moment in the twenty-first century, the earth faces many unprecedented challenges to its survival. The human population is growing exponentially, global water consumption is increasing, and climates are changing drastically due to global warming. We are

facing the reality that healthy—or even drinkable—water is becoming a scarce resource. In 2010, in an attempt to combat this problem, the United Nations Ambassador to Bolivia, a country that has experienced the devastating effects of water privatization, boldly put forth a resolution declaring water as a human right. With the support of 122 countries, the United Nations passed Resolution 62/292, declaring water as a human right. The resolution states that “the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.”²

Let’s consider the implications of such a resolution: to declare a human right is to make governing bodies responsible for respecting, protecting, and guaranteeing that right. This means that under the 2010 UN Resolution, governments must provide their citizens access to safe and affordable water for personal and domestic use. Additionally, citizens need to be educated about their rights in order to hold their governments accountable. As more pressure is being put on our water resources, the duty of accountability is becoming increasingly important. Many countries, including the United States, Canada, and the United Kingdom, have yet to commit to the principle of water as a human right.

Unfortunately, water is being treated more and more as a profitable commodity, allowing the governments and companies in control of water resources to make money by exploiting a manufactured crisis of scarcity. But the human need for quality water is non-negotiable. To demand money for water is to demand money for life.

We need to democratize ownership of water and eliminate the ability to own other people’s water. Every place, community, and country needs to be in charge of its water. This means making bodies of water the common property of all who live near it, which will require policies and practices generated from an understanding of our dependence on one another and nature.

When I bring a group together around water issues, a connection is automatic. There is buried in all of us a collective knowing about water. Not long ago in many cultures there was an active articulation of water's essential role in sustaining life. Today, I have only found this in indigenuous cultures. Imagine if this collective knowing were embedded in our contemporary culture, and became a part of our teachings. Would we use waterways, rivers, and oceans as our sewers? If we all knew that salmon return to the river in which they were born after as many as five years out at sea, would we continue to dam and destroy the rivers they depend on?



*“If we surrendered to earth’s intelligence,
we could rise up rooted, like trees.”*

—RAINER MARIA RILKE

As an Earth advocate, I envision a value system that is complex enough to help us properly care for and share this planet; a value system that understands our interdependence with the earth, and all her species. In my vision, clean water, air, and soil would be available for all life without a price tag. Pipelines would not cross through rivers, waters would belong to those who protect them, and the possibility of war over water would not exist. Throughout history, many cultures have encoded protections for water into daily life. Such respect for water is far more common in Indigenous cultures—cultures that are often now on the front lines of fighting to keep their waters. When I visited Tibetan villages and monasteries, I met

people who know how to protect their waters. They protected the forests around the waters, and prevented livestock grazing around precious water sources. Unfortunately, many of these cultural norms have rapidly disappeared in the last 20 years.

Our legal system, which has evolved to protect private ownership regardless of its impact on living systems and human beings, must be re-examined and adjusted to protect the rights of all life.



Around the world, some governments are beginning to declare water to be a human right. Slovenia, Ecuador, Bolivia, and South Africa are leading the way in this radical idea, declaring that the earth has rights and even granting rivers personhood. India has granted legal personhood equivalent to that of a minor to the Ganges and Yamuna rivers, the Gangotri and Yamunotri glaciers, as well as a set of other

natural elements. The verdicts also conferred guardianship responsibilities on city and state governments to protect these glaciers and rivers. Meanwhile, New Zealand declared in 2017 that its Whanganui River, which flows across the North Island, has the rights of personhood. This ruling reflects the tradition of the Maori, who have a saying: “We are the rivers, and the rivers are us.” This ruling also designates as the river’s representatives a committee from the Indigenous community that fought for these rights.³

“Water does not adapt to life; life adapts to water.”

This movement to grant personhood for nature is one of the most effective movements, reflecting the reality of our complete dependence on water, air, and soil.

A Thousand Rivers; Ten Thousand Streams

If corporations have personhood, then surely rivers must at least have the same rights of personhood.

Trees and water are the two essential life-giving elements on earth that can interrupt climate change. Our waters have been treated as though they can be endlessly engineered, moved, and destroyed. They have become our sewers.

There are more than 84,000 dams in the United States, many of which are now in decay. Oversized hydraulic projects have interfered with the temperatures, flow, and life-giving qualities of rivers around the world. Their impact on earth's living systems is staggering.

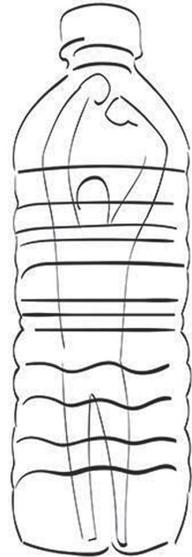
Envision an international governance of the 1,400 major rivers and countless smaller streams and tributaries that would restore flow and aliveness to earth. We can begin a project as ambitious as the Trillion Tree Campaign. We must restore our rivers to be the primary restorative force for our ecosystems.

Let's start an international movement for rivers and streams. How can we move this into the U.N.?

Bottled Water

No matter what issues I raise in a lecture, the questions that I am most often asked are: What water do you drink? Which bottled water or water filter is best? What is clean water?

Here is an attempt to answer: Water is a part of everything, so the issues are not only about what you drink, but also about how your food is grown. Remember that all the food that you eat is based on water. Therefore, isn't this just as important as keeping drinking water clean?



Water's mineral content determines the taste, and also how hard or soft it is. Water from a spring can have many different minerals and will taste differently depending on those minerals. "Alive" water from a spring or well has plenty of microbes and minerals. This is the "best" water you can drink. Unfortunately, many of our springs either contain pollutants or have been destroyed. If you have a well, it is important to have the water tested annually, because various toxins can enter into our water systems. The truth is that water will always find a path, regardless of the erroneous belief perpetrated by fracking companies and other polluters that they have quarantined their dirty water somewhere safe. There are no truly impermeable boundaries.

Purified water from your drug store has been mostly emptied of healthy microbes and minerals. It is potentially less healthy to drink purified water instead of tap water, because our bodies need the naturally occurring minerals and microorganisms in order to maintain a strong immune system, and these are usually still in the tap water.

As consumers, we are confused and seduced by the word "clean." The market for bottled water is a feeding frenzy, with corporations racing to find the right combination of words to make more people buy their water. "Natural" water from springs, water that has never touched the ground, purified water, water fortified with essential minerals, locally sourced water, water from a pristine distant island, and artesian well water: all descriptions that water bottling companies have given their products to increase their appeal.

Bottled water can be useful in emergencies. However, there are large portable cleaning units which can be used to clean water after a hurricane or earthquake that eliminate the need for bottled water. Using this technology would not only cut costs, but also easily supply more people with clean water.

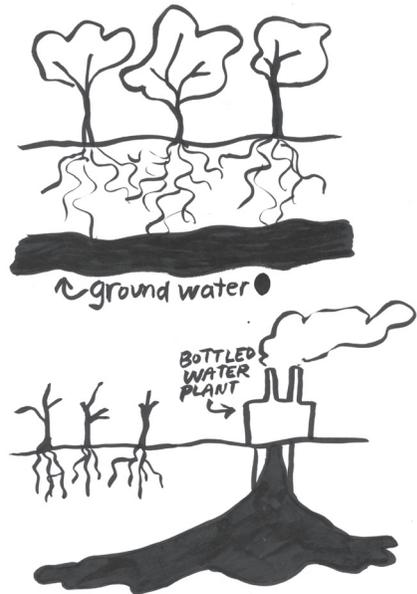
The Water Barons

Bottling water is an extractive industry. It sucks the water off a site, bottles it, and transports that water to far-away markets. When a bottling company moves in, a community usually loses control of its water supply. Even if the community receives an economic boost for a time, its crops, livestock, or local businesses eventually suffer. Bottled water can not become the water that we rely on in our daily life.



most bottled water, when tested, has been found to contain tiny pieces of plastic.

In the 1980s, people began to speculate that water would eventually become “the next oil” and such a scarce a commodity that wars would be fought over it. Tragically, we’re on the trajectory for this prediction to come true: water speculation is going full steam ahead, and global water speculation—the search for new markets to sell to and new sources to exploit—has become an entire industry.



In their quest to privatize resources on a massive scale, banks and billionaires are buying water to the extent that they are being called “water barons.” Such commodification of water is no less serious as a threat to life on earth than is the fossil fuel industry. By treating water as a commodity, we evade the obligation to understand water’s role in creating and sustaining all life. Many people have known that companies are buying up water, yet I was stunned

to learn how extensively banks and individuals have also bought up quality water supplies around the world.

Billionaires such as T. Boone Pickens, George H. W. Bush's family, Li Ka-shing and others have bought aquifers and lakes



worldwide—but because of many state regulations, individuals who have a small lake on their property cannot collect the rainwater that falls on their own property,

or source water from a lake on their property. Megabanks such as Goldman Sachs, JP Morgan, Chase UBS, Deutsche Bank Credit Suisse, Macquarie Bank, Barclays Bank, the Blackstone Group, Allianz, and HSBC Bank, among others, are consolidating their control over our waters.

Speculators are predicting and creating a water crisis. Is there enough water for everyone? Is worldwide water scarcity a result

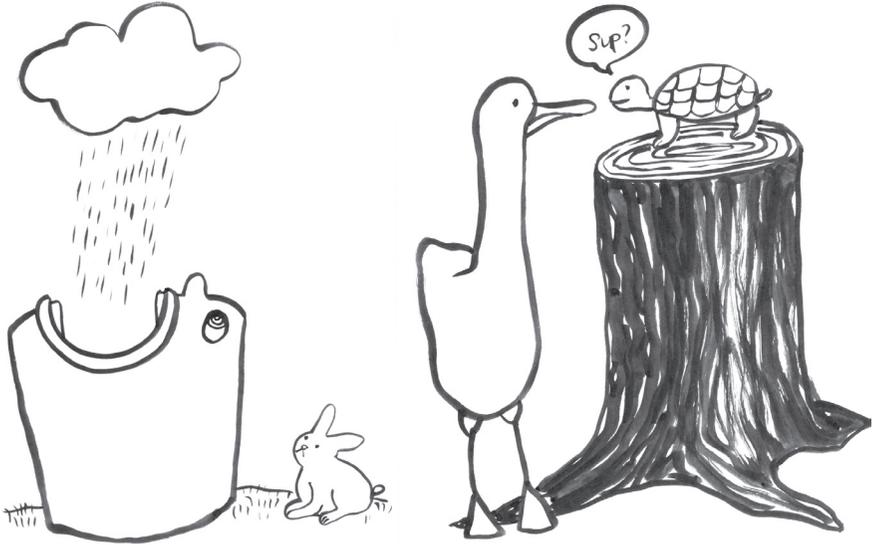


of global population growth? Individuals and businesses are rushing to privatize the world's waters. Cities are running out of water, while watering their streets with drinking water. Populations are being deceived by bottled water's calculated misinformation campaigns in service of the commodification of water. We are witnessing the shortsighted drive for domination and control of our water systems, motivated by



greed. Water privatization and mismanagement lack any consideration for the future of living systems or for humankind's universal dependence on those systems. Water scarcity is, by and large, the result of uninformed and incorrect decision-making: dependence

on crops unsuited for a particular area, antiquated planning, crumbling infrastructure, the use of drinking water for municipal purposes like cleaning roads and washing industrial sites, and systematic refusal to reuse and repurpose gray water (from bath tubs, showers, or washing machines) or rainwater.



Your Body is Water

“The highest form of goodness is like water.

Water knows how to benefit all things without striving with them.

It stays in places loathed by all men.

Therefore, it comes near the Tao.”

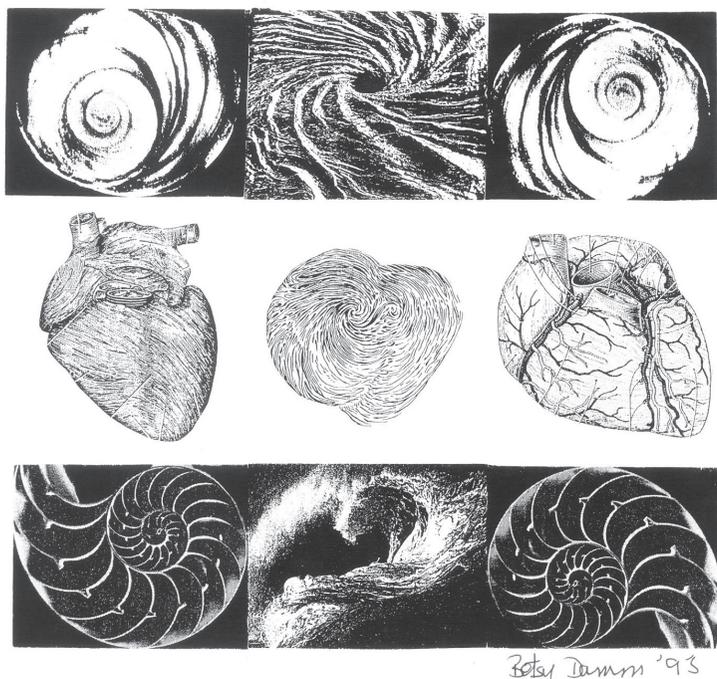
—LAO TZU, TAO TEH CHING, p. 17, #8 (tr. John C. H. Wu)

One of my early curiosities was to understand how water creates patterns in the sand, carves rocks in compelling ways, and facilitates the formation of the human body.

When we are born, we are made up of about 78% water. As we age into adulthood, our bodies shift toward 50 to 60% water. Our water content declines further into old age.⁴ Our hearts are 75 to 80% water, our brains 80 to 85%, and our bones 20 to 25%.

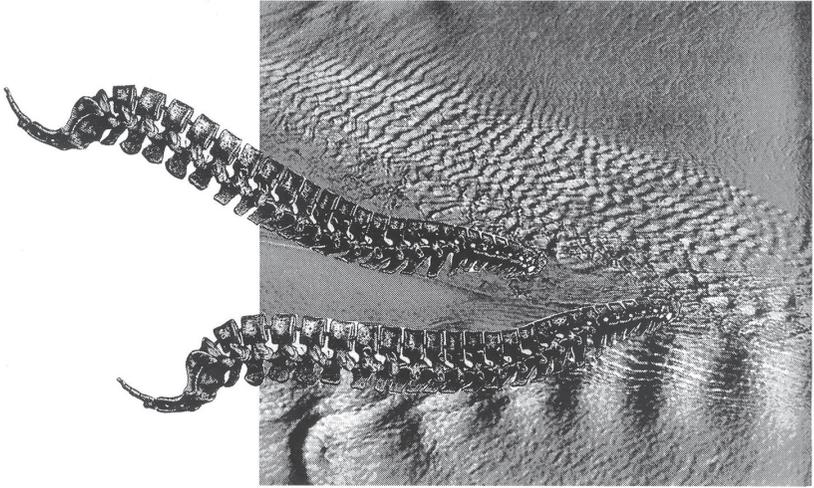
Interestingly, I found research that concludes that a healthy heart has a dynamic beat, not a regular one.⁵ Water reflects our hearts: healthy water contains complex forms and minute variations, and when reduced to lifelessness, one cannot see anything but a simple pattern. Water is healthiest when it is dynamic, not stagnant or purified. The complexity of the healthy heart is paralleled by the complexity of living water.

Some time ago, I came upon an old anatomy atlas with beautiful etchings of every detail of the human body. This inspired me to make a series of visuals, called *Your Body is Water*. These images of the body reveal the flow patterns in the human body.



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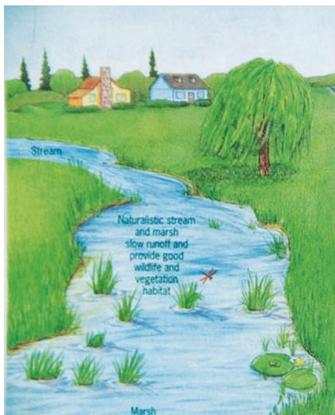
Like a whirlpool, the heart is a series of interlocking vortices: the most powerful self-perpetuating creative form in the universe. If you look carefully at the forms around you, you will find vortices everywhere, from leaves to galaxies.



Betsy Damm '95

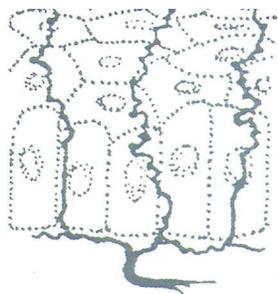
Spines hold up our bodies with both strength and flexibility. With its interlacing structure, a spine resembles formations made by waves passing over sand.

The muscle layer in the body and the feathers of animals share the manifold strength of streams of water, bound taut by a water molecule.

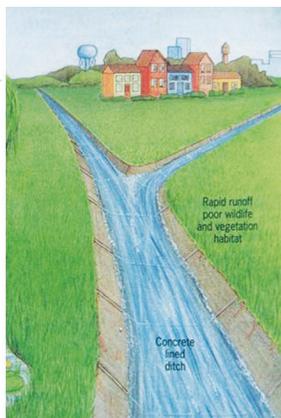


Meissner's corpuscle
(touch)

WATER TALKS



Free nerve endings
(pain)



There are infinite ways to discover how water creates form. Comparison between the skin of the earth and human skin reveals that we can scarcely tell the difference. Similarly, a healthy nervous system resembles a watershed. Compare the nerve endings of the nervous system with water systems that have been straightened into concrete ditches. Look at these nerves responding to touch, and their

remarkable likeness to dynamic water systems. In the first instance, the nerves go straight and rigid in pain. Concrete ditches support only a few life forms. The relaxed nerves are sinuous and flowing. A river in connection with plants and the earth that flows freely supports complex life.

Water is the formative organizing element in our bodies. It is a tireless agent of protection, movement, and replenishment. It is our bodies' coolant in the summer and radiator in the winter. It carries and flushes waste while simultaneously bringing nutrients and oxygen to every part of us. A lack of water impacts every function in the body. In the following visuals, you'll see that the body mirrors water in many ways.

Water's Principles

To address the water crisis, we need to take a step back and understand water's most fundamental principles. The principles of water are what I think about when I am designing for and with water. For example, water was here before me. I learned from water; water did not learn from me. You might have your own ideas for principles about water—feel free to write them down. Mine are by no means absolute, rather they are my effort to reveal water.



In one water drop, there is an infinite amount of information.

WATER TALKS



Every life form on earth is created by water.

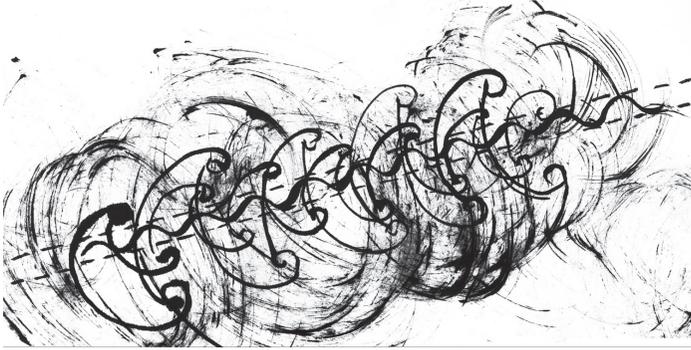


All mammal hearts are created with the vortex.



All waters are connected.

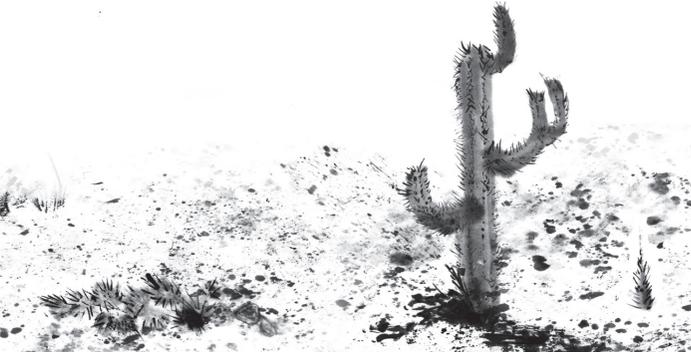
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No matter how small the pipe, the water will not move in a straight line.



The natural vortex motion of water throws off pollution.



Life adapts to water, water does not adapt to life.

WATER TALKS



The primary motion of water is the vortex.



Galactic burst; water pouring forth