

GROUNDING

A Fierce, Feminine Guide to
Connecting with the Soil
and Healing from
the Ground
Up

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CONTENTS

Introduction . . . 1

PART ONE BRASS TACKS

- 1** Imagine the Year 2050 . . . 17
- 2** The Legacy Load . . . 23
- 3** The Story of All Things . . . 31

PART TWO THE CRY OF ALL WOMEN

- 4** How Did We Get Here? . . . 49
- 5** The Cry of All Women . . . 59

PART THREE HEALING FROM THE GROUND UP

- 6** Inner Work and Outer Work Are One . . . 81
- 7** Returning to Our Roots . . . 93
- 8** We Are Inherently Worthy . . . 101
- 9** Remembering We Are Nature:
Growing Our Own Food . . . 107
- 10** Facing Death and Regeneration: Compost and
Healing with Indigenous Peoples and Lands . . . 117

PART FOUR INTEGRATION: DIVINE FEMININE AND DIVINE MASCULINE

- 11** Living a Regenerative Life . . . 127
- 12** Owning Our Power . . . 141
- 13** What's Possible . . . 155
- 14** The Divine Dance . . . 163

Acknowledgments . . . 169

Notes . . . 173

About the Author . . . 179

PART ONE

BRASS TACKS

Nobody said it would be easy.
We have serious work to do, and a lot
of it. To begin, we must focus on the
basics. In order to create the future
we want, we must first find our feet.

1

IMAGINE THE YEAR 2050

Imagine you're a thirty-year-old mom. It's 2020, and you have just given birth to a newborn baby. Now imagine thirty years have passed. You are sixty years old and your baby is now a thirty-year-old adult.

In 2050, the earth's population has risen to over 9.5 billion people. The oceans, as projected by NOAA scientists way back in 2014, are 70 percent more corrosive than they were, but even at that time they were already dissolving the shells of small animals.^{1, 2, 3} Climate change, as projected by the Intergovernmental Panel on Climate Change (IPCC) scientists in 2013, is now completely irreversible by humans (except by a freak technology or act of god), and is pushing average temperatures well above the 2 degrees Celsius increase scientists have warned would be catastrophic.⁴ More than a quarter of land species are threatened with extinction.⁵ Fifty to seven hundred million people have been forced to migrate because of land turning to desert all over the world.⁶ Supplies of clean drinking water and healthy soil for food are rapidly deteriorating. Half of the earth's oxygen is at risk because of threats to microscopic life in the oceans.⁷ This is what it's like in 2050. Take a deep breath. And imagine.

I learned about global warming sometime in middle school. And at the time, we were taught that our grandchildren's grandchildren would have to face the problem. I remember wondering what it would be like to be part of the generation of people who would slowly come into awareness that they were it, that the future of humanity would turn on what they decided to do. I wondered how long it would take them to figure it out. Would it come slowly and creep up on them? Would they argue about it? Would people deny it? Would it fix itself before they ever got there? And how exciting it would be. And terrifying. What might it be like to be part of the most important group of people in the history of the human species? The only group to have to—and get to—consciously choose whether to survive or to perish.

IT'S TIME

It's time. Everything happened a lot more quickly than scientists back then expected it to, and it's accelerating to this day. If you expect to be alive any time in the next thirty years or beyond, you're it. There's no other group of people to pass this on to. We've kicked the can as far as it will go. If we want to create a world that we can keep living in, it's time, and it's us. It's time for us to see things as they are and to stop making excuses, and it's time to summon the courage to do the work that we all know we need to do. We have a shot, but the window is small and closing rapidly.

I know it's terrifying. But if we turn that response on its head, it's also unbelievably exciting. Everything we'll do in the next ten years is of lasting consequence. No group of humans has ever had such a collective responsibility, or such a collective opportunity. As I heard it said at the Paris climate talks in 2015, we need seven billion pairs of hands (now closer to eight billion) to do this work, to turn this ship around. It can be done, and it's going to take all of us, together.

The number one thing we need to do today, next to slowing our fossil fuel emissions to a stop, is to devote ourselves to healing soil all over the world as quickly as possible. In order to have a shot at slowing the effects of climate change, we must pull carbon out of the atmosphere. A lot of it belongs in the soil, where plants can make use of it, which is where we should store it. If you have no idea what I'm talking about, you have found the right book. For a number of reasons, this most obvious conclusion is incredibly counterintuitive for most people. In truth, it's countercultural.

My journey to this simple conclusion has not been simple in the least. But here I am, and I've already bet everything I have on it. I'm throwing down on this simple point, because it's the truth, and because it is arguably the most important thing we can know and act upon when it comes to addressing the most urgent challenges facing humankind. Here's the deal:

- ▶ There's too much carbon in the atmosphere and in the oceans for humans to fare well in the near future.
- ▶ There's a legacy load of carbon in the atmosphere, meaning that even if we were to stop all emissions 100 percent today, we would still be barreling toward a two degrees Celsius average global temperature increase and beyond. NASA calls the land and the oceans the "other half" of the carbon and climate conversation.⁸
- ▶ Soil sequesters carbon. In fact, it's a natural carbon sink. It already holds more than the atmosphere, plants, and animals combined.⁹ Carbon-rich soil is good for plants and humans.

What we need is to get down to the brass tacks. In other words, we need to get back to our roots. We need to understand at the most basic level where our food comes from and

how a healthy food system actually works. We must come to terms with where we are getting our water and how the water cycle actually works. And we have to ask ourselves what we're going to do with the excess carbon in the atmosphere and in the oceans and deal with how the carbon cycle actually works. How are our physical bodies connected to both the earth itself and global systems at the macro and micro levels? And how in the world do we manage our physical reality in a sane way that preserves survival and can allow for true regenerative abundance?

These are the most important questions facing humanity today, and we need a clear-eyed look at how it all works in order to figure out what to do about it. We need, more than anything, to build from the ground up and get the basics right. But first, we may very well need to take a giant step back to gain some much-needed perspective. To get clear on the basics even, it may serve us to zoom way out, and then back in.

Only by standing in our own ground
can we determine our future.¹⁰

ANODEA JUDITH

As big as the earth may seem to us, we are in fact a whole bunch of infinitesimally small people on a tiny, finite planet. Happily, we have co-evolved with other life-forms on this planet (plant, animal, and otherwise, including the microscopic life in the soil and the oceans) to live in both symbiosis and homeostasis. In other words, in partnership and balance with all the other life-forms here.

Unfortunately, we have unwittingly disrupted critical systems, in particular the carbon and the water cycles, altering them so dramatically that it's destroying our own habitat. Because earth systems are so profoundly interconnected, we're looking at far more than rapid temperature change, sea level rise, and storms. As a result of ocean acidification, biodiversity loss, and desertification, we are currently facing the sixth mass extinction of

species on the planet.¹¹ And our soil, that six-inch layer of life from which all of our food comes, is turning to dust all over the world. At the same time, the human population is growing exponentially. Adding two billion people to the current population over the next thirty years is the best guess, but it could be more.

The coming storms, heat waves, droughts, cities under water, and refugees are only part of the problem. We are facing threats to our food supply, our drinking water, and even our oxygen. We've lost 40 percent of our phytoplankton since 1950; phytoplankton are the bottom of the ocean's food chain and are responsible for nearly half of the world's oxygen.¹²

In 2013, CO₂ in the atmosphere reached 400 parts per million (ppm) for the first time in recorded human history;¹³ in March of 2016, the average global surface temperature crossed the two degrees Celsius increase threshold beyond which scientists warn of devastation for the first time in human history—a threshold we're projected to cross for good by 2036.¹⁴ This is all happening in real time, right now. By the time you read this, most or all of this data will be outdated, because we are moving along timelines with exponential curves. That means that nothing in our past experience is comparable to what's happening now, not to mention what's about to happen in the next thirty years and beyond.

Human survival is at stake. Without question. Everyone alive today is part of the deciding generation. Take a moment to look at what's going on in the news right now and see what is actually going on in the world. American politics (at the time of writing during the COVID-19 crisis) are in free fall. It's time to put our big-kid pants on, and, as Carl Sagan says, "make our stand." Welcome to the most critical set of decisions and actions humankind has ever had to make.

With more than half of the world's population in cities, urban sustainability and global sustainability are one and the same. The world's major population centers are growing to sizes and scales

never before seen, driven by industrialization and population growth. And the key questions to figuring out how to reimagine these cities, which are currently creaking under their own weight and bursting at every seam, have everything to do with the basic needs of humans. Everything boils down to land, water, housing, food, and basic social and economic dignity. Basic needs are simple; the related problems and solutions are complex.

As cringe-worthy as the word *sustainability* has become, it has a functional and useful meaning. Ultimately, a sustainable system is one that can keep itself balanced in perpetuity, rather than being poised for collapse. A sustainable city is one that is built from such systems and is connected to larger systems that can hold their own. It's also a city where people can meet their basic needs of food, water, and shelter on a daily basis. The notion of a regenerative world takes this one step further. A regenerative world is not merely avoiding collapse, but is designed, like nature, to be abundant beyond our basic needs. A regenerative system includes replenishing what we take and inviting nature to blossom in her diversity, resiliency, and fertility.

The task at hand is to connect the individual to the collective in a healthy way. At a global scale, we need to look directly at the basics and create a plan of action. And we need to start doing it before we have all the information. If we wait until all the data about what's to come fall into place before we act, it will be way, way too late. We currently have more than enough information to act in a strategic manner and in an intelligent direction, and we can adjust and refine along the way.

This *intelligent direction* is toward healthy soil and gender equity all over the world. There are only wildly positive effects to healing soil and supporting women and girls, and we need to do these now in order to turn the climate emergency around, no matter what else we do. Unequivocally. It's a no-brainer.



2

THE LEGACY LOAD

The carbon cycle is currently out of whack as it relates to humans and most creatures on the earth. I mentioned the first big problem in the last chapter: the legacy load. We know that there's entirely too much carbon in the atmosphere and that we've long since blown past the "safe level" of 350 ppm. We crossed 400 ppm of carbon in the atmosphere on May 9, 2013, and we're still climbing.¹ According to the IPCC, it would take almost 100 years to get back to 350 ppm even if we had stopped emitting altogether in 2007.²

Stopping emissions is not going to be enough. Slowing emissions is definitely not going to be enough. We have to turn this ship completely around, and there's no time to half-ass it. This unpleasant information is elegantly captured in the IPCC's Fifth Assessment Report (AR5):

Most aspects of climate change will persist for many centuries even if emissions of CO₂ are stopped. This represents a substantial multi-century climate change

commitment created by past, present, and future emissions of CO₂. A large fraction of anthropogenic climate change resulting from CO₂ emissions is irreversible on a multi-century to millennial time scale, except in the case of a large net removal of CO₂ from the atmosphere over a sustained period.³

Translation: To get back to where we were before, we actually need net negative emissions. Net. Negative. We need to not only slow and stop emissions, but to draw carbon out of the air and store it in the earth. A lot of it, over a long time. In other words, we need to do all the things. All. The. Things.

We're not supposed to talk about this because it will freak people out. Either that or they'll just dismiss the data outright. It's a lot to digest. And given how terribly we've done with the information we already have about the need to reduce emissions, the concern is that people will simply shut down and do nothing (or, in fact, continue to make the situation worse). We don't have time to be stuck in fear. Even if we're afraid, we need to lean in to it and keep moving forward, and the only way we're actually going to be able to grapple with the problem is to get a handle on it and face it.

I checked in with the lead author of this particular section of the IPCC report, and he was actually hopeful that if we can lower emissions quickly enough, we can adapt to what's currently occurring on the planet. I hope he's right. That said, if we were to simultaneously lower emissions and move to rapidly draw down and store carbon in the soil, it would still be of tremendous benefit to our overall situation, no matter our level of success in lowering emissions. In *Drawdown*, Paul Hawken and Katharine Wilkinson do a wonderful job of covering what it will take to heal the soil and sequester carbon in a wide variety of ways.

In worst-case scenarios, we'd at least give ourselves a little bit more time to change our systems enough to lower emissions in the face of a growing population. In more optimistic scenarios, we actually get our act together and get ourselves on a path to net negative. Whatever happens, the earth needs to take in one large, sustained inhale. The inhale, as it happens, is the yin part of the breath. Surrendering, receiving, taking in before and after releasing. Every natural cycle, including our breath, follows this rhythm.

OCEAN ACIDIFICATION

Next to the legacy load, we face ocean acidification. The effects of the oceans absorbing more carbon than they can hold are clear. Too much carbon in the oceans causes the ocean pH to change, and our oceans are currently quickly acidifying; they are literally becoming corrosive. And excuse my French, but it's fucking terrifying. Ocean acidification is coming at us faster and more definitively than climate change, and climate change is coming at us like the proverbial freight train.

It's worth repeating: our corrosive waters are dissolving the shells of baby animals right now. At the rate we are going, waters will be 70 percent more corrosive by 2050, and the amount of sea life with dissolving shells could triple.⁴ That's just twenty-nine years from the publication of this book, and counting. Perturbing the oceans is an altogether horrible idea. When researching this topic, I found utterly terrifying lines like this buried in academic papers:

By process of elimination, primary causes of mass extinctions are linked in various ways to the carbon cycle in general, and ocean chemistry in particular, with clear association with atmospheric carbon dioxide levels. The prospect of ocean acidification