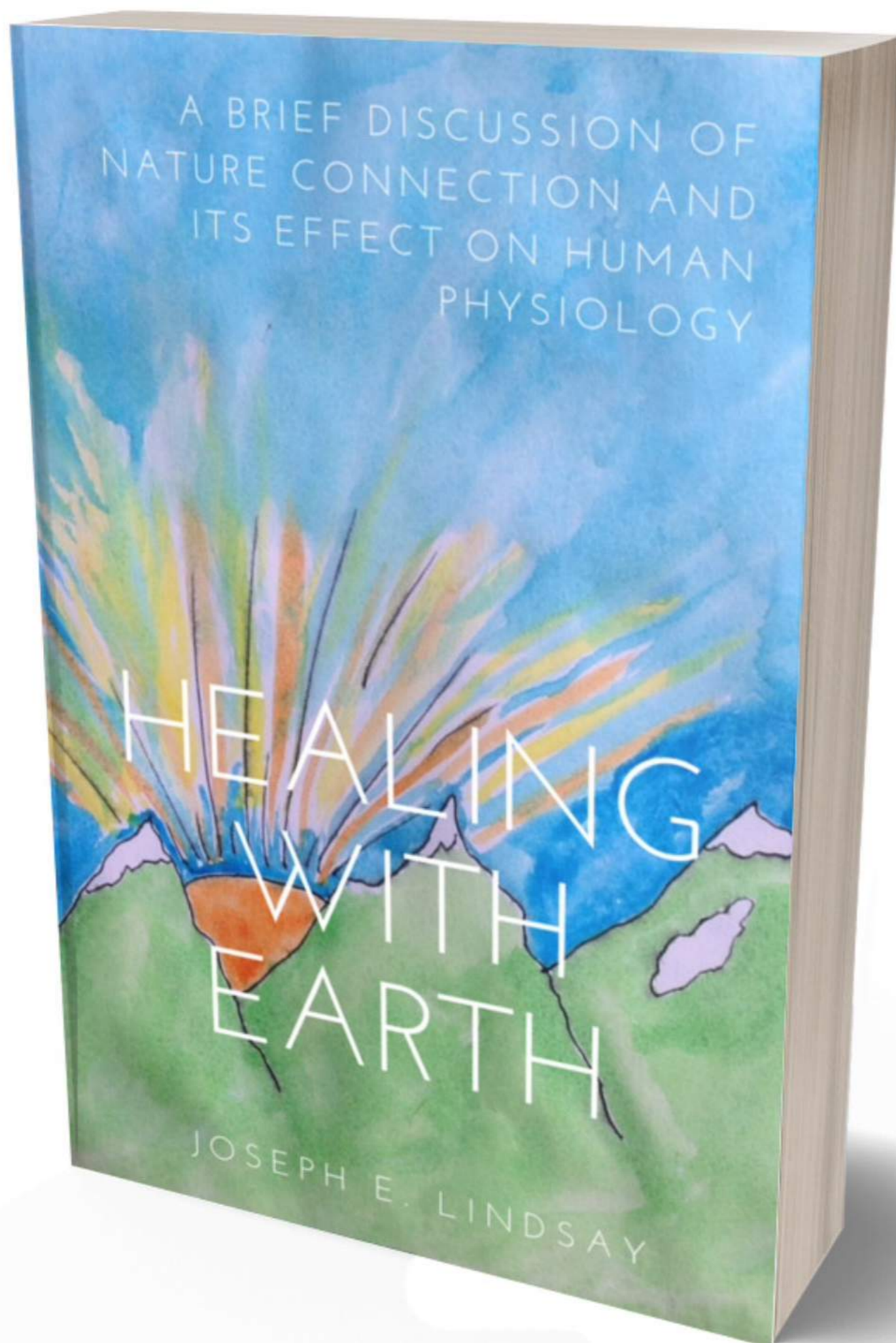


A BRIEF DISCUSSION OF
NATURE CONNECTION AND
ITS EFFECT ON HUMAN
PHYSIOLOGY

HEALING
WITH
EARTH

JOSEPH E. LINDSAY



Introduction

I believe in the healing power of Nature experience - especially when combined with mindful breathing and taking inventory of my senses. It works for me. I feel the positive healing effect of spending time in wild places. Even in more developed natural surroundings like city parks— Nature Heals. I believe. But not everyone is like me (thankfully).



Some folks need numbers.

They want proof. Maybe they're from Missouri (the "Show Me State").

In this small book I will share facts for the skeptics and cite research being done in the field of forest therapy where researchers are measuring the effect of Nature exposure on: blood cortisol levels, immune system function (killer T-cells), blood viscosity, blood pressure, heart rate, and the electrical charge of the body.

Interesting stuff, and its measurable.

Even though I'm a believer, I am not a gullible knee jerker. This research has helped me to feel even more committed

to this path of sharing Nature's healing power with more people.



Know Thine Enemy

Before sharing some of the research I feel it is important to understand what we are attempting to heal. Is there a need for healing? Is anyone sick?

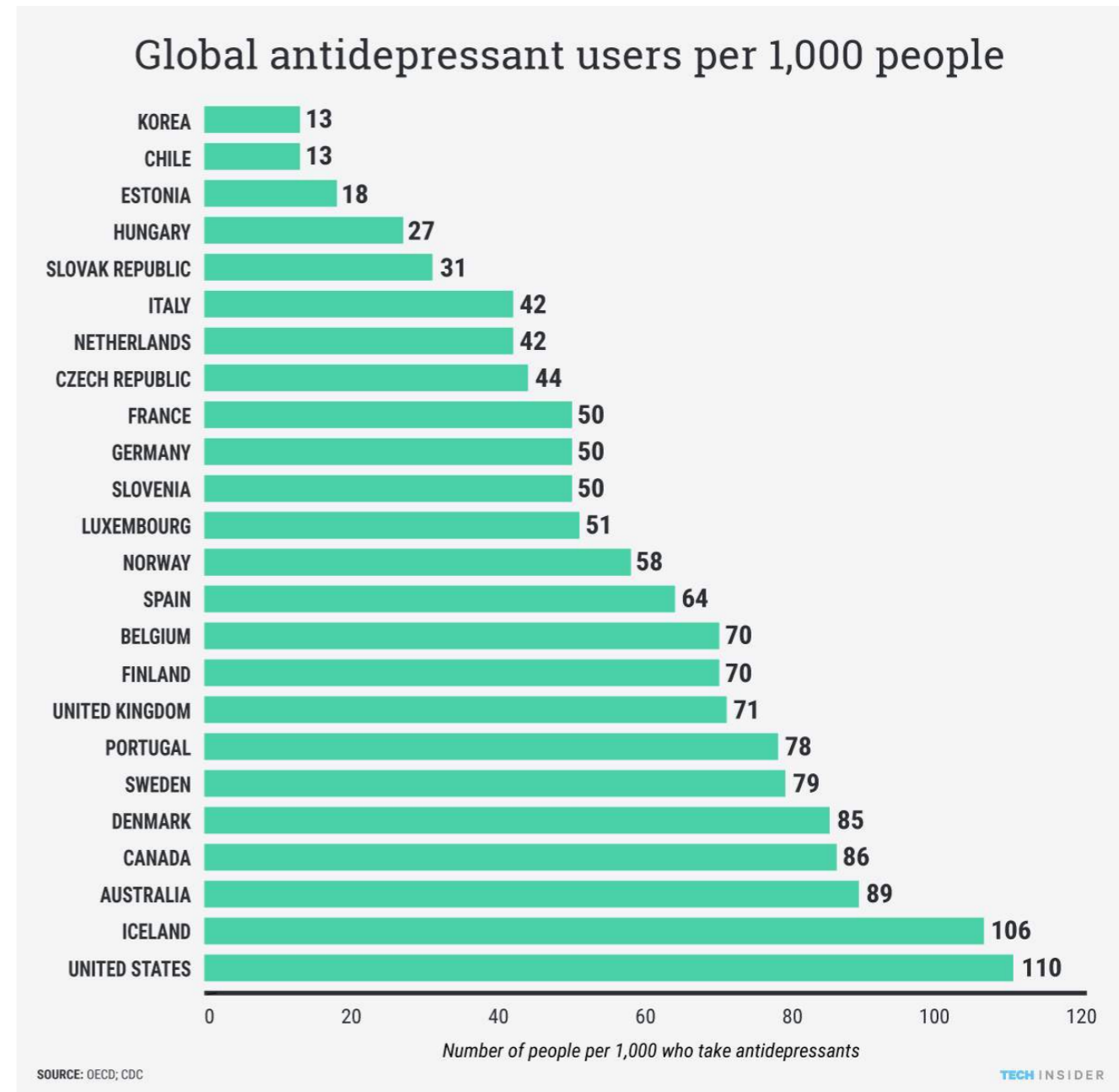
Yes. And it seems that many are HEART SICK. Anxiety and depression have reached epidemic proportions.



"Anxiety is the most common mental-health disorder in the United States, affecting nearly one-third of both adolescents and adults, according to the National Institute of Mental Health." [Link](#)

"Major depressive disorder affects approximately 14.8 million American adults, or about 6.7 percent of the U.S. population age 18 and older, in a given year." (Archives of General Psychiatry, 2005 Jun; 62(6): 617-27)

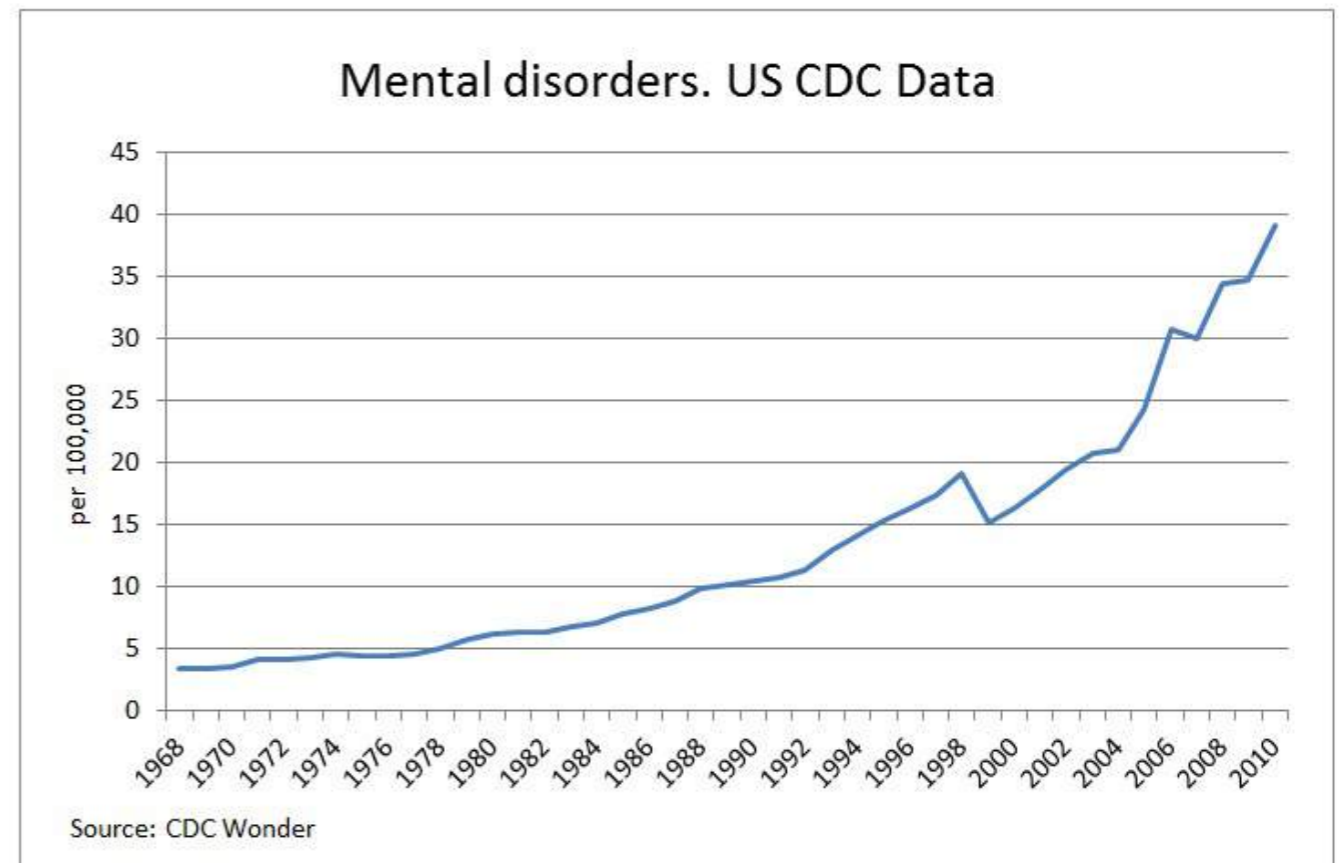
"About six million people are affected by late life depression, but only 10% ever receive treatment." (Brown University Long Term Care Quarterly, 1997)



Some writers and thinkers claim that just being alive at this time on the planet means feeling the threat of our own demise, calling it "extinction anxiety". [Link](#)

For many of us, just the pace of our lives is dangerous - a chronic state of urgency - never being *on* time, not having *enough* time, never going fast enough, doing enough, making enough, to keep up on the merry go round that is participation in the industrial growth society. This leads to higher blood pressure, increased heart rates, higher levels of cortisol (the stress hormone), and increased systemic inflammation. All of these combined can cause a person to age more quickly and die younger.

Some describe this state of mind as having the gas pedal floored while at the



same time stomping on the brakes. Most people feel stress and anxiety in their solar plexus - just above the navel - a tense knot of energy.

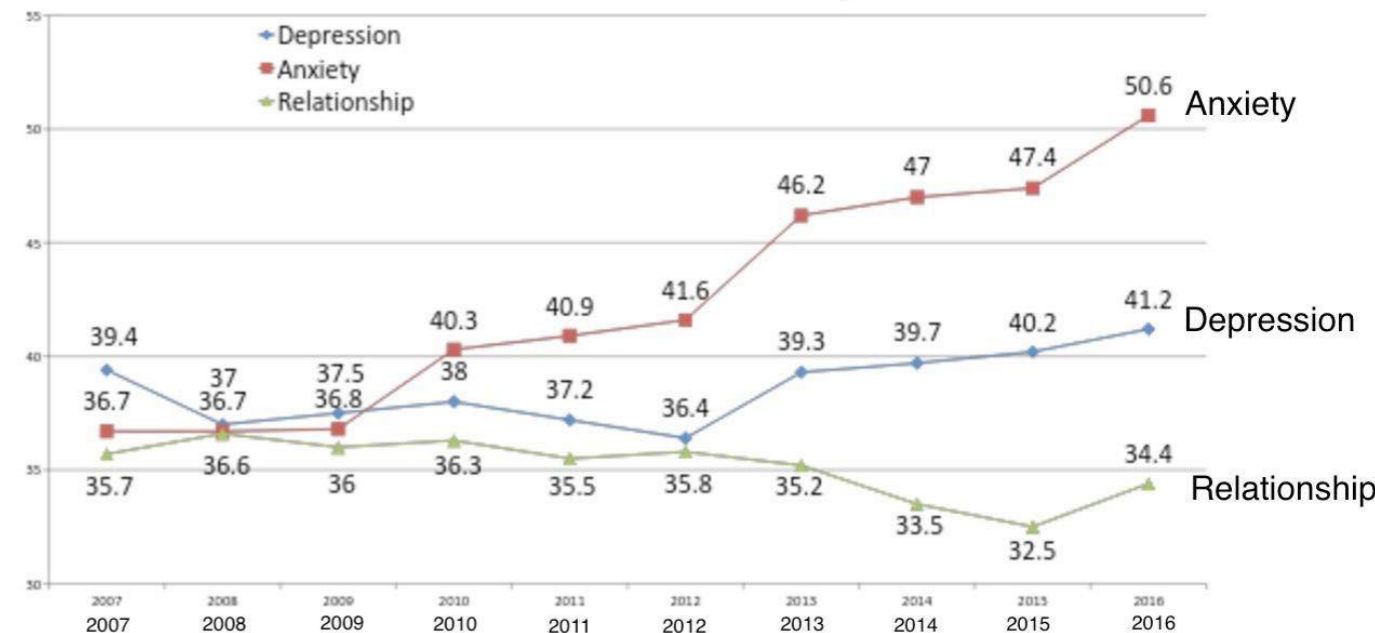
As the pace of life continues to speed up and get more demanding and complicated it is ever more important to seek out effective, safe, healthy treatments to balance and sooth ourselves. Traditional solutions for stress, anxiety, and depres-

sion have mostly been medication and, at times, talk therapy. Both are useful and necessary in some instances, but neither holds the power to heal that Nature wields.

Quiet mindful time in Nature is the most ancient and effective treatment for what ails the modern heart-mind.

Before deciding to slay the dragon it is important to understand its nature. How strong, pervasive and established are the dangers of anxiety, stress, and depression? What are we up against?

**Most Frequent Presenting Concerns In Counseling Centers
2016 AUCCCD Survey**



Reetz, D.R., Bershad, C., LeViness, P., & Whitlock, M. (2017). *The 2016 Association for University and College Counseling Center Directors Annual Survey*. CO: AUCCCD

How Long has it Been?

A compelling number that supports a Return To Earth is 200.

That's roughly how many years it's been since the Industrial Revolution when steam engines, interchangeable parts, and petroleum fueled a rapid exodus from the countryside to the city.

Another number of note is 200,000 - according to most sources, that's how long modern humans have roamed the Earth. 200 vs. 200,000.



This means that for 99.99% of our time on the planet we lived mostly as hunter gatherers, then as agriculturalists and for a thin slice of time as urbanized industrialists.

We used to live on the Earth. We slept on the earth. We walked for locomotion.

Considering these numbers it is not surprising that many of us feel anxious and unhealthy in our modern world.

We are simply not used to living this way.

Our physiology and psychology evolved in deep relation to the landscape.

What is now seen as normal behavior (living in buildings, driving in cars, sitting in chairs) has only been going on for .01% of our history.

Given this information is it any wonder that we feel more relaxed and at peace when we take breaks from the frenetic pace of life and immerse ourselves in natural, undeveloped landscapes?



Nature = Relaxed BodyMind

Chronic low grade stress is an epidemic effecting every age group and demographic in our industrial society. In the body this manifests as a tight knot of muscle tension in the solar plexus – just below the rib cage and above the navel. Many people do not know life without this feeling.

For some, it is a constant companion.



Accompanying this tightness are: increased activation of the sympathetic nervous system (fight or flight), increased heart rate, increased blood pressure, increased levels of cortisol (the stress hormone).

Here then is some of the data gathered by researchers in Japan where most of the investigations have taken place:

Increased Heart Rate Variability

Some background: When my fight or flight nervous system is engaged my heart beats in an extremely efficient and regimented predictable manner - ready to make the most of each beat to maximize efficiency of physical output should I need to fight for my life or flee from danger. So, the sympathetic "fight or flight"

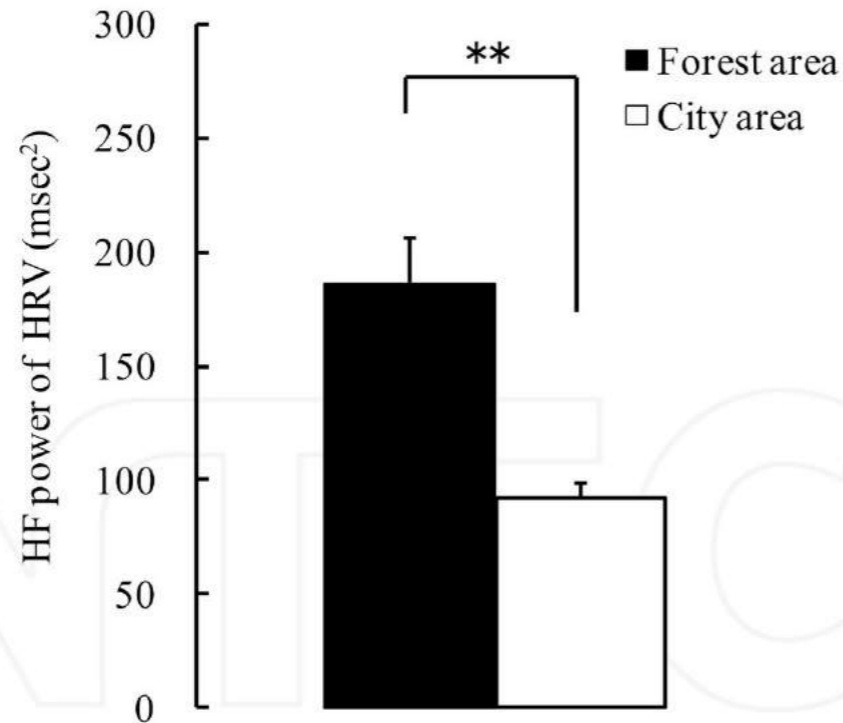


state equals a lower Heart Rate Variability.

Conversely, when I am relaxed, resting and digesting, my *parasympathetic* nervous system is engaged. My heart rate in this state is variable - not predictable. My heart does not need to maximize efficiency when I am feeling safe and relaxed

- it can afford a few late beats or early ones that are not "on time". So a higher Heart Rate Variability shows I am more relaxed, that my parasympathetic nervous system is engaged.

Here's a graph from some of the research on Heart Rate Variability in subjects exposed to a forest environment vs. an urban environment.



N = 322; Mean \pm SE; ** p < 0.01; p-value by t-test. (Source: Park et al., 2011)

Fig. 8. Change in HF power of HRV on forest walking.

The forest environment increased HRV in subjects meaning that their parasympathetic nervous system was engaged, meaning that they were more relaxed there.

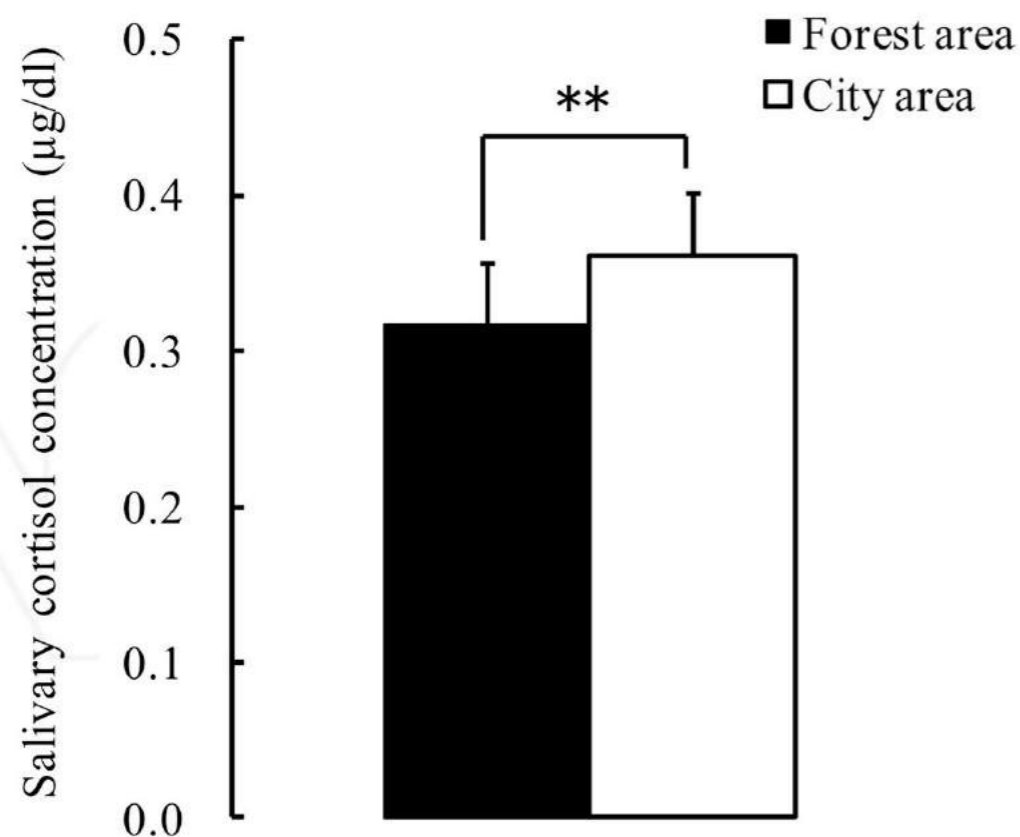


Lowered Salivary Cortisol

Cortisol is a hormone that is released when the body undergoes stress.

Here is a graph from the research showing the differences in subject's cortisol levels in the forest vs. the city:

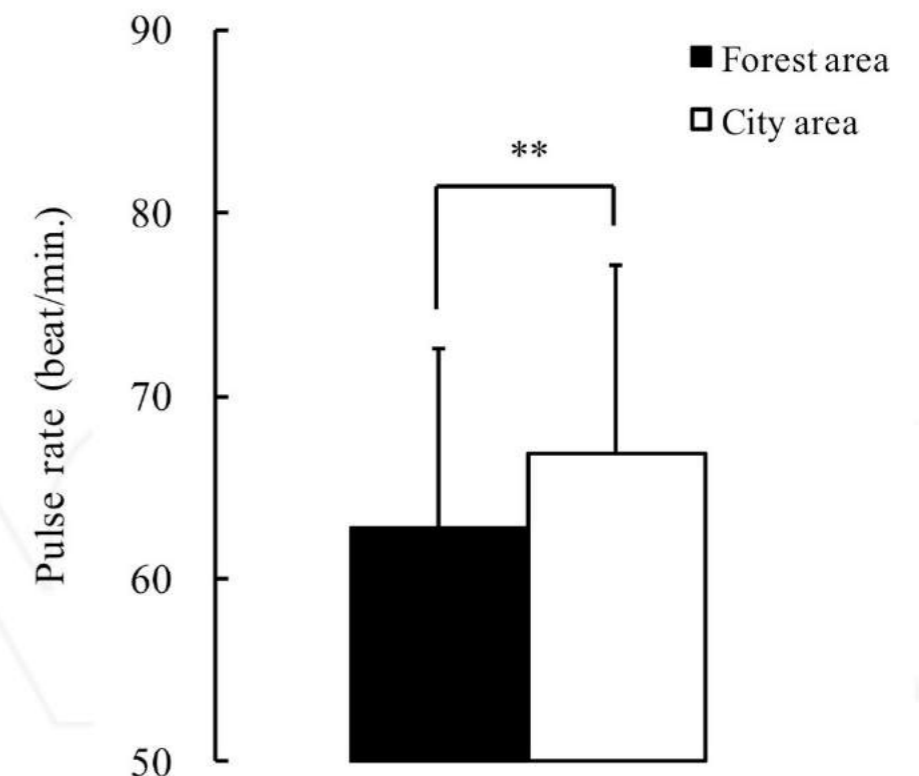
In the forest subjects cortisol levels were lower. They were less stressed.



Lowered Heart Rate - Beats Per Minute

When I am nervous or stressed my heart beats faster. An increased heart rate is indicative of an activated sympathetic/fight or flight nerve response.

Another graph:

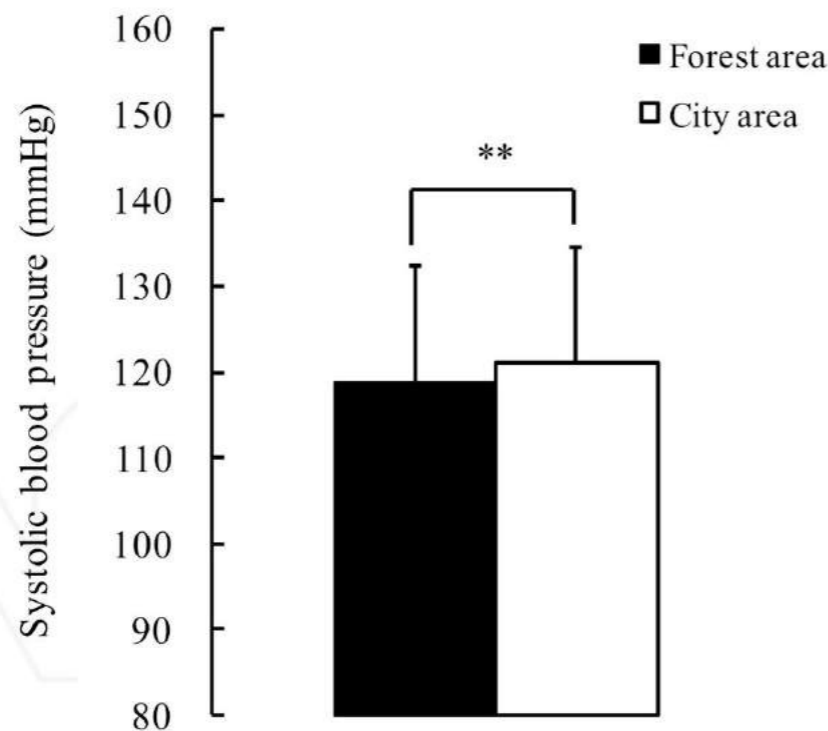


N = 75; Mean \pm SD; ** p < 0.01; p-value by t-test. (Source: Park et al., 2011)

Fig. 4. Change in pulse rate after forest walking.

Lowered Blood Pressure

Consistent with higher Heart Rate Variability and decreased heart rate is decreased blood pressure. Here is the blood pressure graph from the research:



N = 75; Mean \pm SD; * $p < 0.05$; p-value by t-test. (Source: Park et al., 2010)

Fig. 6. Change in systolic blood pressure after forest walking.

Here's the story: chronic low grade stress is dangerous. *Really dangerous.*

It contributes to most forms of heart disease, cancer and psychological disorders. It causes people to die many years before they should. It wears out the system – burns it out. It's a real good idea to prevent or manage it. Most allopathic solutions have been of a pharmaceutical nature— many of which come with side effects.

Mindful time in nature can alleviate many of the symptoms of chronic low grade stress. When a person walks into a forest or other natural landscape and slows down, looks around, appreciates where they are, opens their senses and just focuses on BEING – these symptoms subside.

But you already knew that.

Now you have some graphs and numbers to back that up.

[Link](#)



Mindful Time In Nature:

- Reduces Fight of Flight Response
- Lowers cortisol (stress hormone)
- Increases Heart Rate Variability
- lowers Blood Pressure
- Lowers Heart Rate (BPM)

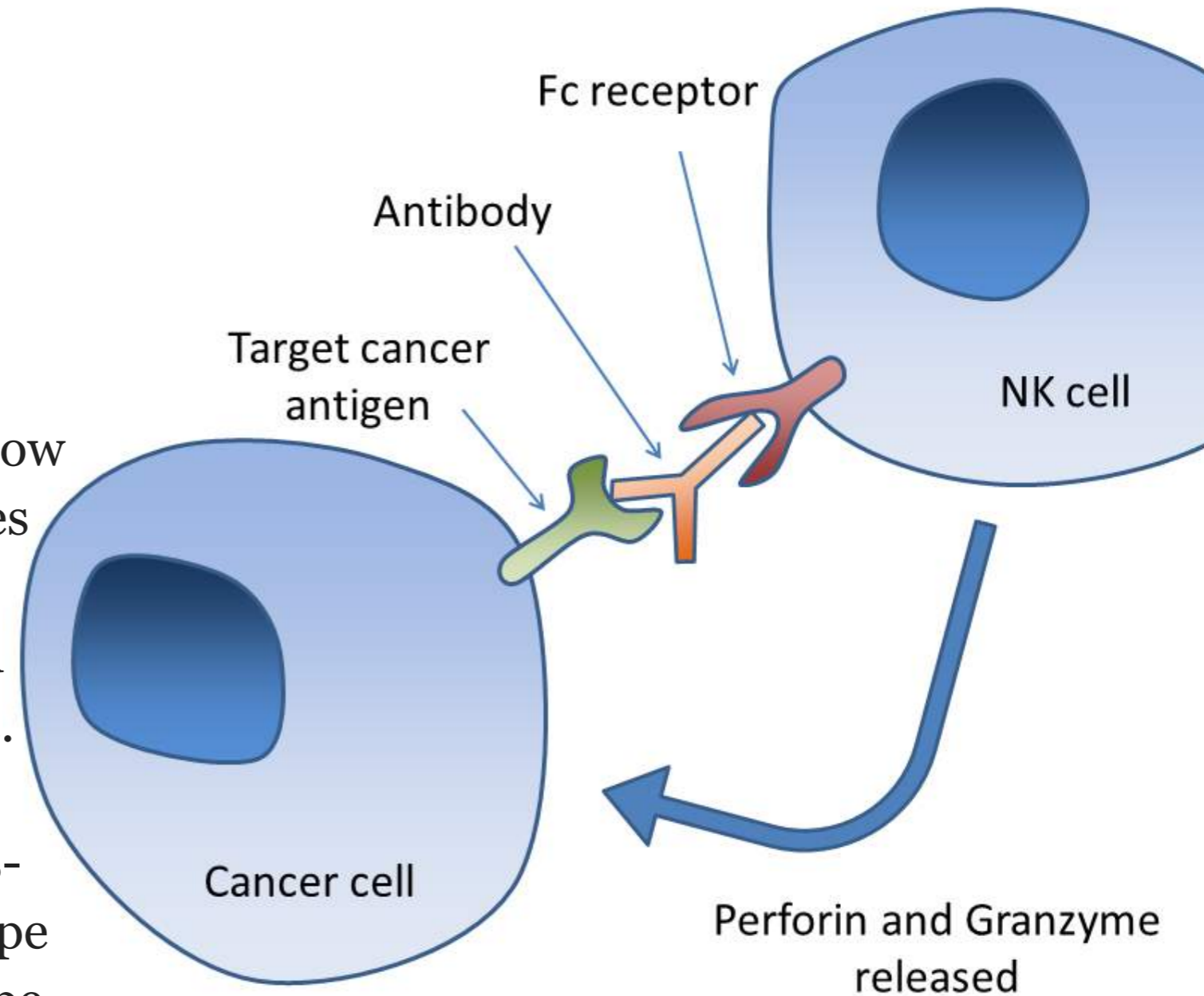


Nature and Immune Function

Nature not only reduces symptoms of low grade chronic stress, but also stimulates the immune system.

I am more likely to remain healthy and strong the more time I spend in nature. And there is science to back this up.

A key player in the human immune system is the Natural Killer (NK) cell, a type of white blood cell (lymphocyte) that specializes in the elimination of cancer cells and ones infected with viruses. They do this by releasing proteins (perforin, GRN and GRA/B) that hunt down and destroy a targeted cell.



To test for immune system activity, scientists draw blood, count the NK cells present and test for intercellular concentrations of these proteins — thus determining the activity and robustness of the immune system.

In early September 2005, Juyoung Lee, Qing Li, and Yoshifumi Miyazaki from Japan's Chiba University and Nippon Medical School took a group of 12 people and tested their blood for NK activity in the urban setting. This was their "control". Then they went on a three day/two night trip to a forest area in northwest Japan. After the second day of hiking they took blood samples which they analyzed for NK activity and presence of the above mentioned proteins.

They found that the subject's NK activity had increased by 56%.

Not only that, but a month later, their NK activity was elevated 23%.

A month!

A separate study found that even short trips, a 30 minute walk in a city park, positively effect NK activity which remained significant seven days later.

[LINK](#)



Diabetes and Nature Therapy

Diabetes is an increasingly serious, potentially overwhelming condition for health-care systems across the globe. The World Health Organization recently published data showing that approximately 150 million people in the world have diabetes mellitus. This number is projected to double by the year 2025 with most patients hailing from the developed world. [LINK](#)



Exposure to Nature significantly reduces blood glucose levels in diabetes patients.

A 1998 study by Ohtsuka, Yabunaka, and Takayama tells the story, over six years, of 87 noninsulin-dependent diabetics that were given forest therapy treatments (3 or 6 km forest walks dependent on their level of physical fitness). In six years, the team gathered data on 237 individual forest walks.

On average, blood glucose levels dropped from 179 before hiking to 108 mg/dL after.

Given that Diabetes effects the lives of 150 million people and costs approximately 825 billion dollars per year - finding effective, low cost, and readily available treatments would be wise. [LINK](#)

Nature Therapy looks like a good place to start.



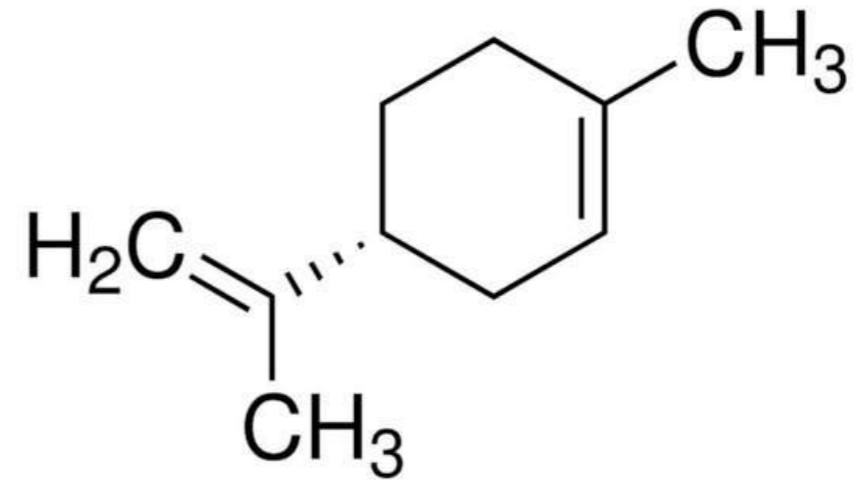
Agents of Forest Healing

The research shows it: wandering mindfully in forests positively effects the physiology of the wanderer. But why is this? What's in the forest that's absent in the city?

Is there something floating around in forest air? Maybe some kind of molecule?

YES!

Phytoncides!



D-Limonene

They are volatile, odiferous compounds released by plants and trees, protecting them from microbial and fungal infections.

One study of a pine forest concluded that for every 2.4 acres of forest, eleven pounds of phytoncides were released in a 24 hour period.

Forest air is thickly imbued with these compounds. When I walk in a forest I am immersed in a sea of phytoncides - I draw them into my body.

What happens to me when I breathe them in?

My immune system get's a jumpstart. I am able to fight off infection and disease more effectively.

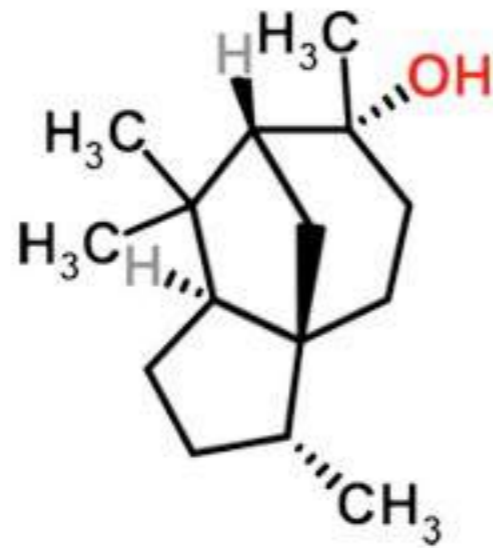
Japanese researchers isolated NK cells (white blood cells specializing in eliminating cancer and virus cells) and immunity proteins (perforin, GRN and GRA/B). Then they introduced the phytoncides Limonene and Pinene (emitted by conifers). They recorded significant increases in NK cell activity and amounts of inter-cellular perforin, GRN and GRA/B.



In another study, Cedrol, a phytoncide emitted by cedar trees was administered to subjects. After inhaling Cedrol, their heart rates, blood pressure and respiratory rates all decreased.

Another study found phytoncide inhalation significantly reduced concentrations of urinary adrenaline and noradrenaline, indicating that phytoncides decrease activation of the sympathetic (fight or flight) nervous system.

The forest air is imbued with phytoncides - when I walk under trees I draw them in



Cedrol

with every breath. They surround, infuse, relax, and calm me.

So it's not just that forests are nice to look at, listen to, smell, and feel.

There are measurable substances present in forest environments that positively change the physiology of the wanderer.

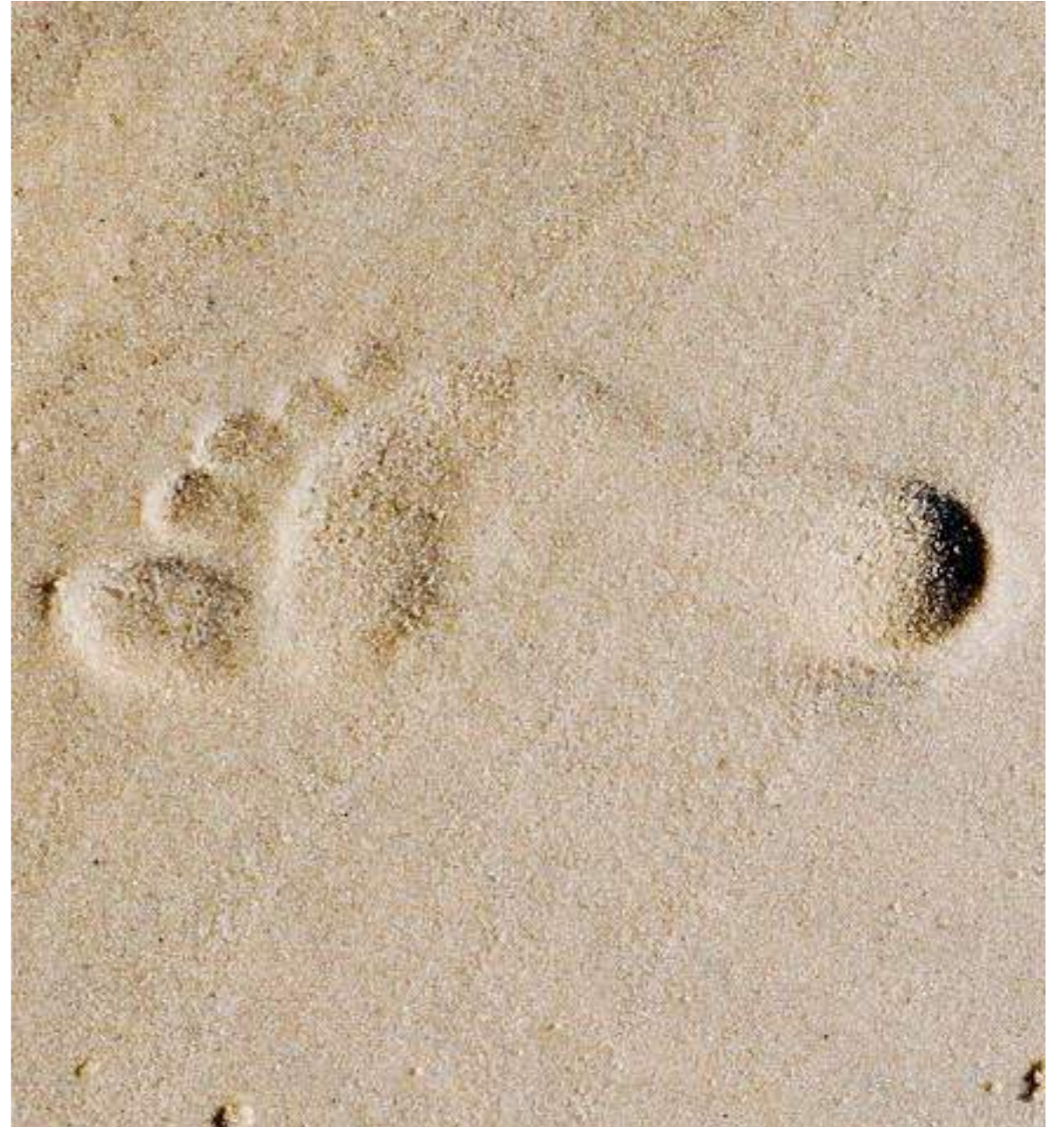
Phytoncides.

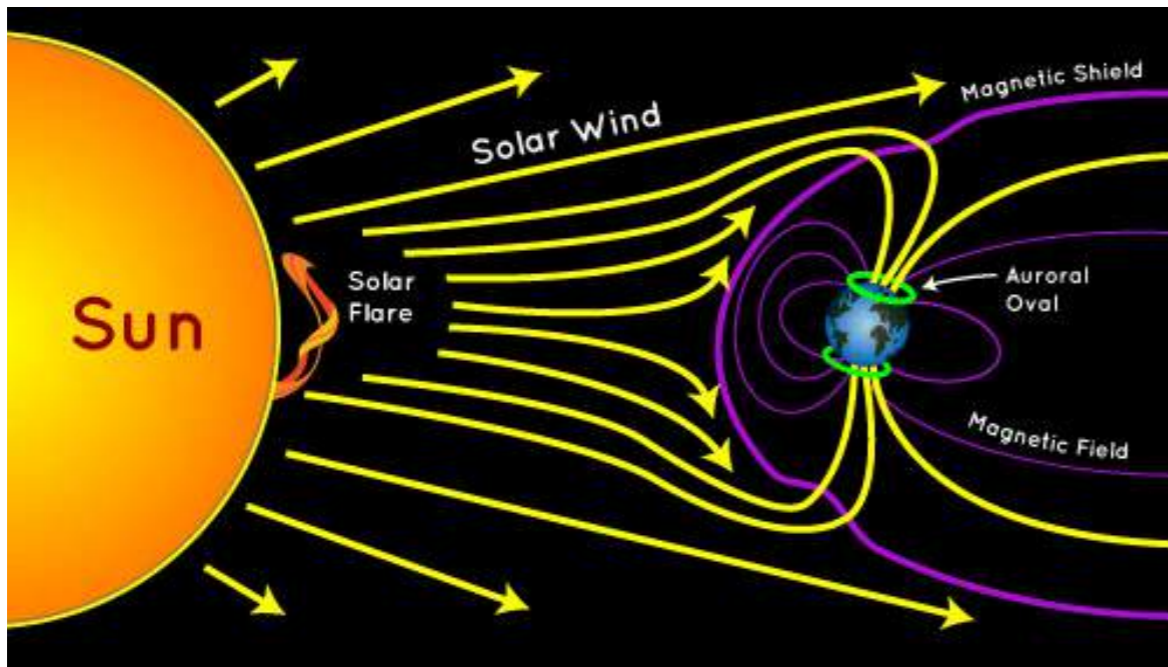


Grounding With Free Electrons

The Earth's surface carries a negative charge which is maintained by a global electrical circuit.

This circuit is maintained by three sources: the solar wind, the ionospheric wind, and thunder storms.





The solar wind is comprised of electrons, protons and alpha particles streaming with great force and speed out of the sun. These particles are mostly diverted around Earth by our magnetic field, but significant amounts still reach us. [LINK](#)

The ionospheric winds blow in a region 50 to 120 miles above the Earth's surface and are caused by differential solar heating and the gravitational pull of the

moon. These winds generate electricity when they come in contact with the geomagnetic field of the Earth. [LINK](#)

And 1,000 to 2,000 thunderstorms are constantly active around the Earth, unleashing thousands of lightning strikes per minute.



These three electrical generators give Earth its negative charge. The Earth is "Ground" electrically speaking. And ground is negative.

Up until very recently we used to walk, sit, live, and sleep on the Earth—directly on the Earth— with no insulating substances between us. As it turns out, this



was good for us. It kept us electrically balanced, healthy, and grounded.



The Human body is electrical. Our hearts need a spark to beat consistently.

Every neuron in our nervous system needs electricity to fire correctly. Our systems work best when they are electrically balanced. Our circulatory, nervous, and immune systems are enhanced by the negative charge of the earth. Specifically, it is "free electrons" or "negative ions" that are responsible for the healthful effects of grounding one's body.

Until recently, humans were electrically grounded most of the time. They spent most waking hours outside and if they wore shoes at all, they had leather soles



which did not insulate them from the electrical charge of the Earth.

These days, most shoes have rubber soles which insulate and prevent grounding.

Wood, asphalt, vinyl, any petroleum based product all insulate us from the Earth and don't allow our bodies to

ground. It is common for people to go for days or even weeks without touching the earth and balancing their body's electrical charge.

Modern day, industrial growth humans spend much of their time in electrified landscapes, being bathed in electro magnetic fields (EMFs), and ever-present



streams of cell, bluetooth, wifi, and microwave signals.

These energies create a positive charge in the body, and produce free radicals which have been linked to chronic systemic inflammation which is linked to cancer, Alzheimer's, and heart disease.

[LINK](#)

What are the physiological consequences of living in electrified (positive charge) environments in the absence of regular grounding?

- Higher blood viscosity (sludgy blood)
- Low grade chronic inflammation
- Higher blood glucose levels

- Increased sympathetic nervous system activity (fight or flight) [LINK](#)

These are serious, far-reaching, systemic



symptoms, linked to many deadly diseases of the industrialized world. Billions if not trillions of dollars are spent every year fighting them.,

All of these symptoms are alleviated when subjects ground their bodies by touching the earth with a bare hand or foot. The balancing occurs immediately.

Blood viscosity, glucose levels, systemic inflammation, and sympathetic nerve activity all *drop off significantly when grounded*.

Being "grounded" is not a metaphor. It is a basic scientific truth governing life on Earth.

We need to touch the Earth on a regular basis. We need it for our bodies to function properly.



The Positive Effects of Negative Ions

When a molecule acquires an extra electron it becomes a negative ion and negative ions improve your health.

One study found that negative ion therapy was as effective as light therapy in subjects diagnosed with Seasonal Affective Disorder (S.A.D.), a form of depression triggered by the coldness and darkness of winter. [LINK](#)



Indoor, heavily electrified, wireless environments give a positive charge to my body which increases blood viscosity (sludge) and systemic inflammation—conditions I want to avoid.

To balance my system after spending a day inside, I try to touch the Earth and ground my electrical body.

Another way to balance and ground is to spend some time with water: specifically—falling water, smashing water, white-water, exploding water.

Out of such frothing waters come electrons: surges, torrents and mighty windy rivers of them.

They collect at the bases of waterfalls, at the beach where the waves crash and on the banks of rivers, creeks, streams and rivulets.

While being smashed and bludgeoned together, water molecules begin to throw off electrons. The ones residing in the outer S orbital of hydrogen atoms in H₂O molecules are broken off from their



bonds and are flung into the torrent - only to get reattached to the nearest positive charge - this is usually on an open bond of a neighboring molecule.

But what if that molecule that wants another electron is part of *me*?

— if it is one of *my* hydrogen atoms comprising one of *my* H₂O's? When that happens I feel good. Positive has met negative. Yin has met Yan. There is wholeness in that water molecule that is part of me and I feel that.

I know, on an embodied, molecular level, that I am balanced and whole. Complete. All-One.

BALANCED.

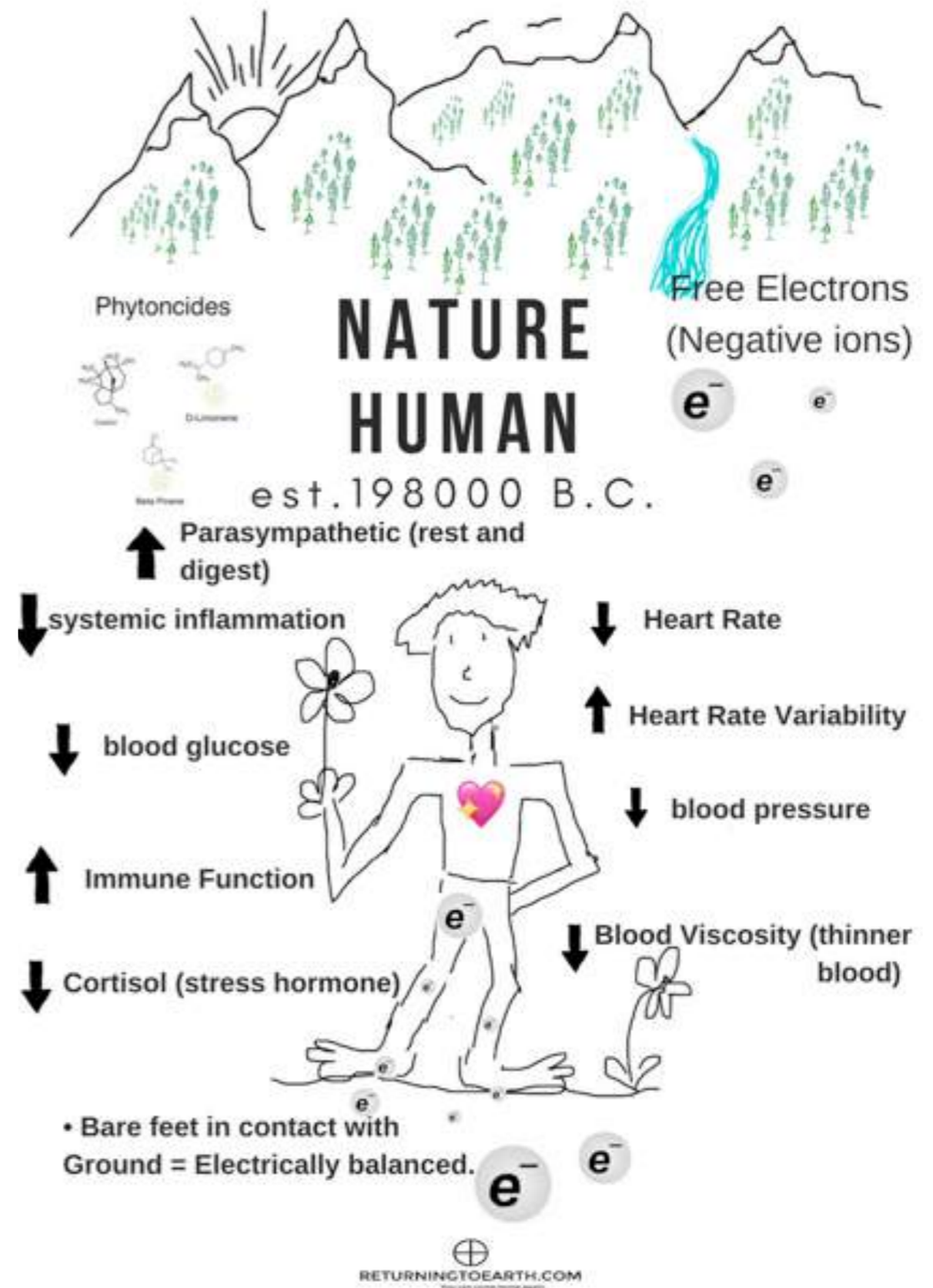


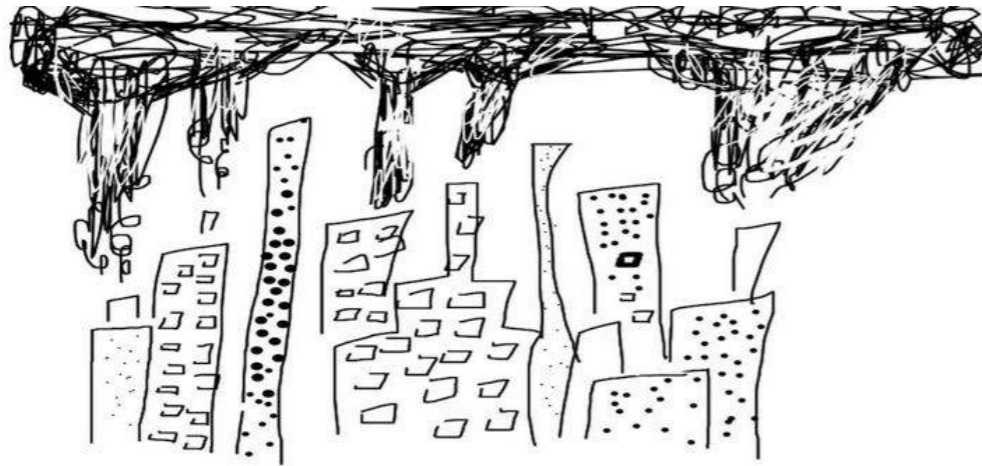
Graphical Distillations

So, there it is: some of the current research about Nature connection and its effect on human physiology.

Here are some graphics that illustrate the findings and amass them in two easy to read documents.

I hope you find them useful.

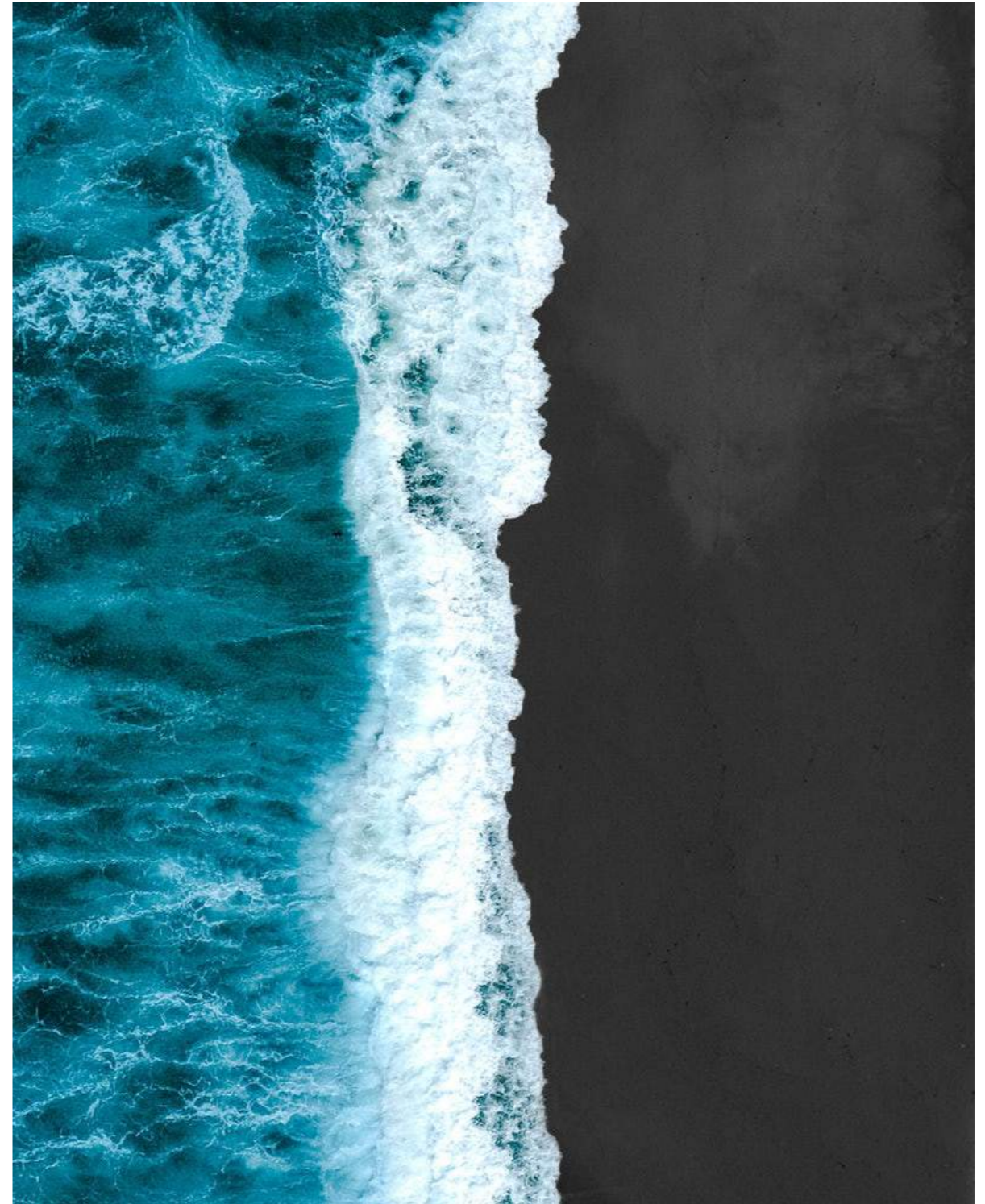
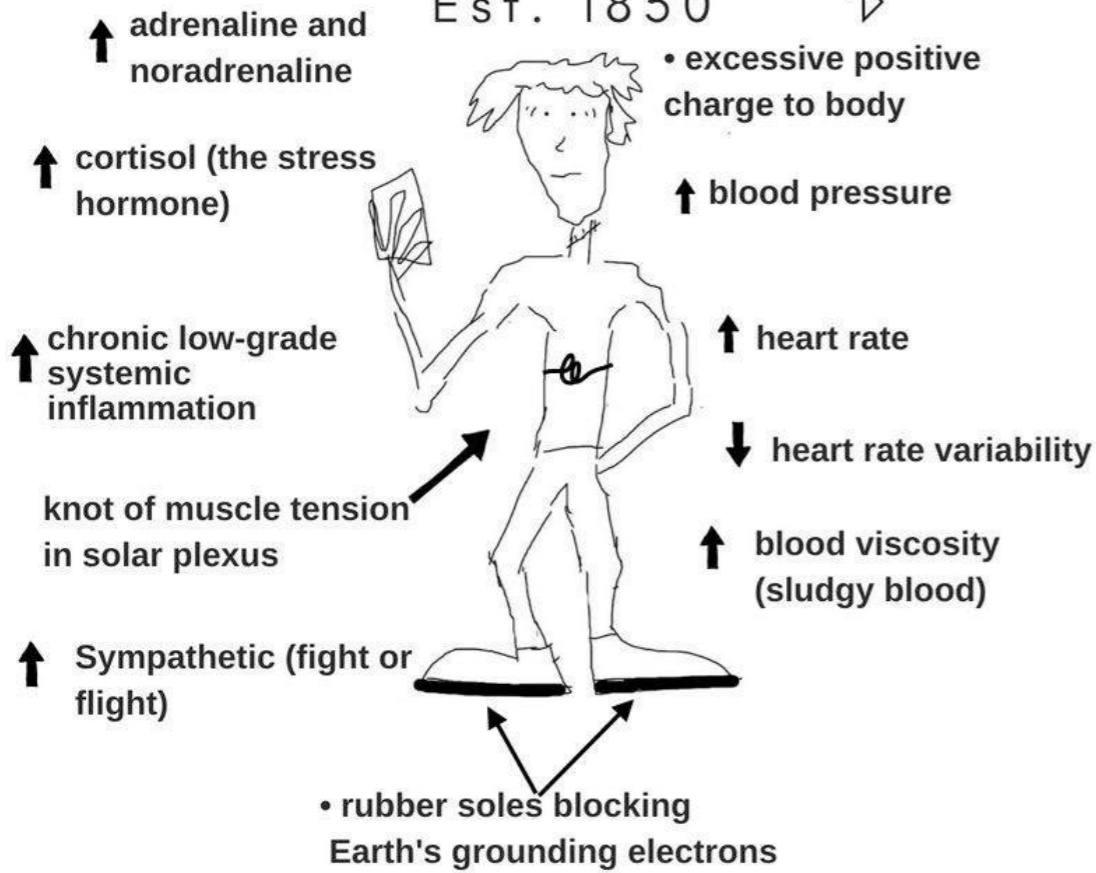




INDUSTRIAL SOCIETY HUMAN



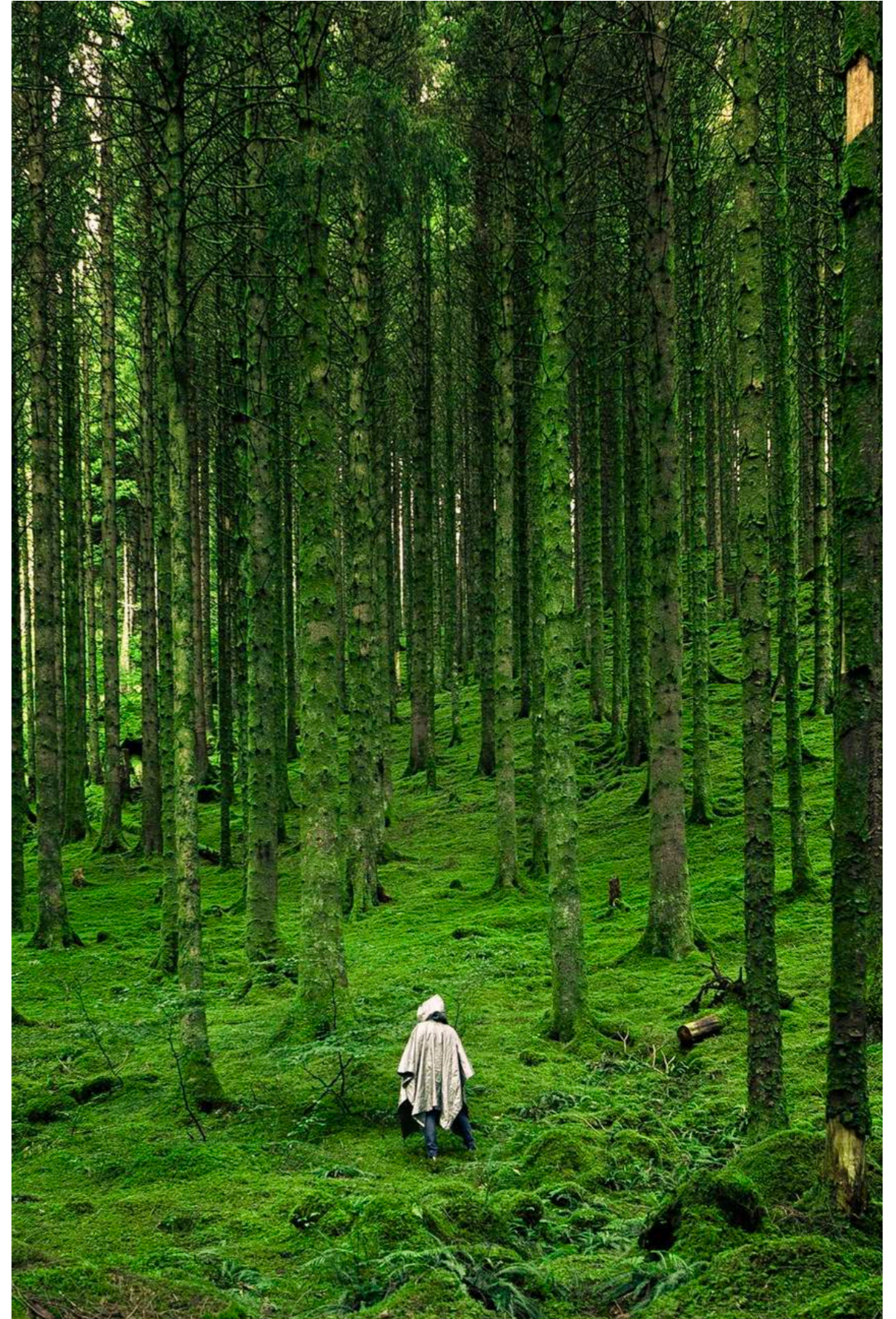
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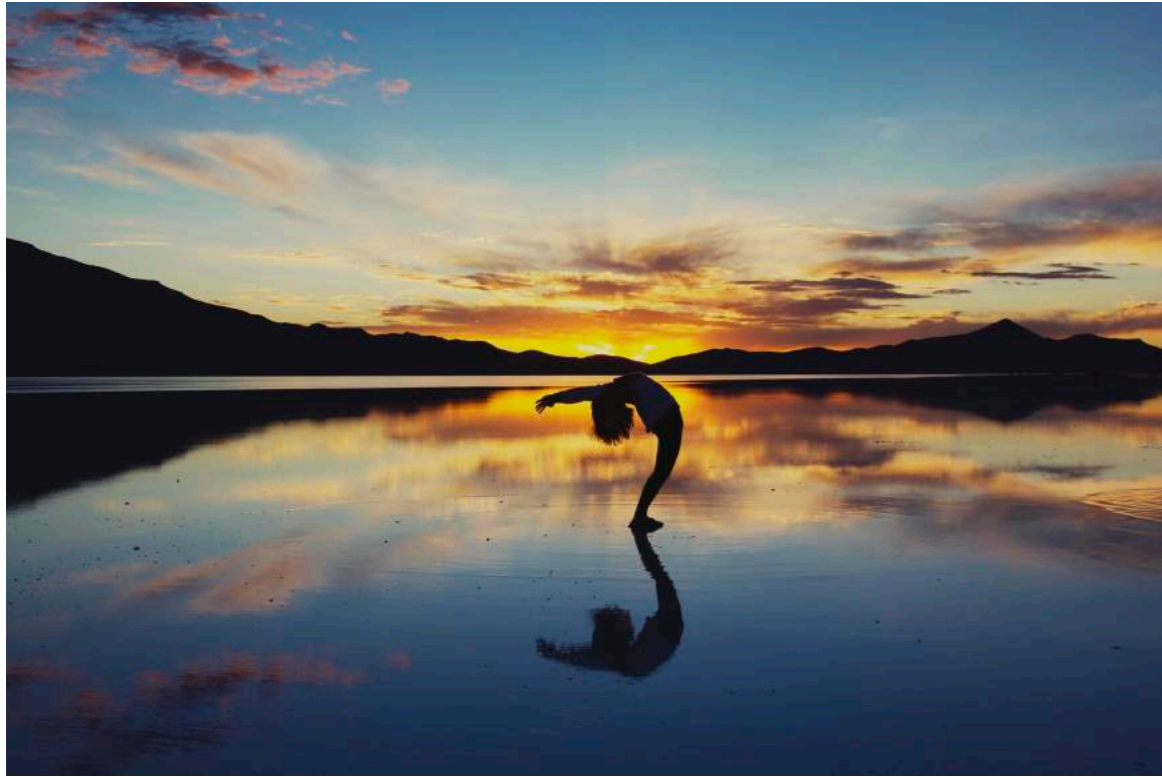


The Bottomless Container

Lovers of Nature know its embrace is healing, soothing and profound. I hope the research I've discussed here has strengthened and deepened that understanding.

And for those not yet convinced of the validity of this work, I hope this information has deepened your appreciation and understanding of Nature, and maybe cracked the door open a bit for you.





An important step in Nature Therapy is peeling back the layers of acculturation and protection that are often necessary to function in the industrial growth society—availing oneself to the medicines of Nature. This can be intimidating but the gifts are numerous and profound.

Softening oneself, becoming more permeable, available, and vulnerable are part of the process in Nature Therapy. This can be uncomfortable for those that have spent much of their lives building and maintaining protections.

It is worth the discomfort.



It is difficult to describe the potential of this work - the *bottomlessness* of the container. The opportunity to make real and lasting change and to truly heal is in that

container. The depth of love, support, and witness I have not found anywhere else.

The Earth heals.

Through consciously entering my senses, following and exploring the pleasures I experience in Nature, and remaining vulnerable and available to the medicines there, I have felt deep shifts in my being.



I wish this for you.

Thank you for your interest in this potent, healing work.

Honey In My Heart,
Joseph E. Lindsay

