

# THREE ESSENTIAL BIOHACKS (WHY BIOHACKING STARTS WITH YOUR ENVIRONMENT)

You've probably heard these myths about "biohacks" or "biohacking" before:

"Drink a can of espresso coffee, pop 30 different supplements, and throw some modafinil on top so that you'll be "focused" and ready to start the day."

That choice is not quite optimal – hint: it's not coffee you need to get started.

You may also have seen websites trying to sell you a few essential oils and bone broth, misleading you into thinking that your stress and anxiety magically disappear when introducing some lavender essential oil and bone broth powder into your life.

In almost all cases that's not true either...

Don't get me wrong, bone broth is an amazing food when sourced from the right animals, but health journeys should just not start there...

Then there are gurus claiming that all health starts and ends with the gut, and that eating fibrous foods and probiotics is the cure to all gut issues.

Wrong again...

Gut health is surely important, but the gut shouldn't be seen as an isolated organ system that's unaffected by its surroundings.

So what do you do if you have a problem? Your first instinct

is to find a biohack – and that’s correct.

But you need the right biohack. This blog post explains why biohacking must always start with your environment, and that you can only ignore that law at your own detriment. That environment not only includes the air you breathe, but also the light that enters your eyes and skin, sound entering your ears, and electromagnetic frequencies in your surroundings.

Unfortunately, most people thus have a completely erroneous view of biohacking. In this blog post I’ll therefore consider three environmental biohacks you need to figure out before trying anything else.



This is a guest blog post by Bart Wolbers. Bart runs a health blog at [www.naturebuildshealth.com](http://www.naturebuildshealth.com) and finished degrees in Physical Therapy (B), Philosophy (BA and MA), Philosophy of Science and Technology (MS – Cum Laude), and Clinical Health Science (MS). Bart

has helped tens of thousands of people take charge of their own health by breaking complex science into actionable recommendations.

## **THREE ESSENTIAL BIOHACKS (+WHY BIOHACKING ALWAYS STARTS WITH YOUR ENVIRONMENT)**

Let’s start with a definition, ensuring you and I are at the same level:

# WHAT IS “BIOHACKING”?

With biohacking you aim to influence your body’s biology and physics, by altering your environment or the things you put in your body.

You may, for example, biohack because you want to improve their health or performance. Other (valid) reasons exist as well, such as becoming a better parent or spouse, improving your ability to make money, or enjoying life more.

Sounds good? Let’s get started then...

I’ll first tell you something about my background for If you’re unfamiliar with me. That background helps you understand why I only understood the importance of the environment for biohacking later in life.

From ages 17 to 28, I was a gym addict. I assumed that optimizing food and exercise were sufficient for being healthy. I also thought that sleep didn’t matter that much for health.

Little did I know that by partying until 4 AM at night, I was slowly ruining my health over time. I also sat unprotected in front of a computer screen for *hours* each day.

And you know what?

I’m a young guy and got lucky. I didn’t get sick because I of my age, and “only” got exposed for a decade. Many people living in modern society *don’t have that luck*, simply because a poor environment slowly wreaks havoc over a long time – *imperceptibly*.

Let me explain that concept of imperceptibility:

Imperceptible damage is most dangerous because you’re never consciously aware that damage is being done. Perceptible

damage is easier to understand for the human mind, because you can see or *feel* that something is wrong.

If you're hit by a car, you'll immediately *feel* that your leg is broken – the feedback is prompt and holding an illusion that you didn't get harmed has instant consequences (such as pain).

Now take an example of (almost) imperceptible damage:

Living inside buildings for 24 hours a day with lots of air pollution won't hit you as hard as that car. Sure, you might get a stuffy nose and breathing becomes more difficult, but you shrug it off and continue your day.

***Over time, nevertheless, the damage being done by environmental inputs such as air pollution are just as real, but in the short term they're really easy to ignore.***

In other words, that indoor living is just as dangerous as the broken leg *in the long run*. You might eventually end up with diabetes due to living under poor artificial lighting, for example.

Dr. Kruse is one of the thinkers who has stood at the basis of considering the importance of the environment for health. And while I do not always agree with Dr. Kruse, I don't think anyone could ignore his message during the last few years either.

It was Dr. Kruse, for instance, who re-popularized the importance of cold exposure and sunlight for health in the last decade, introducing that view to a broad audience.

That thought was a paradigm shift in how optimal health is envisioned. Paleo gurus in 2010 and 2011 had considered food intake as the Archimedean leverage point. Food is just one "environmental" input, however, and in hindsight the full story is more complex than paleo gurus assumed.

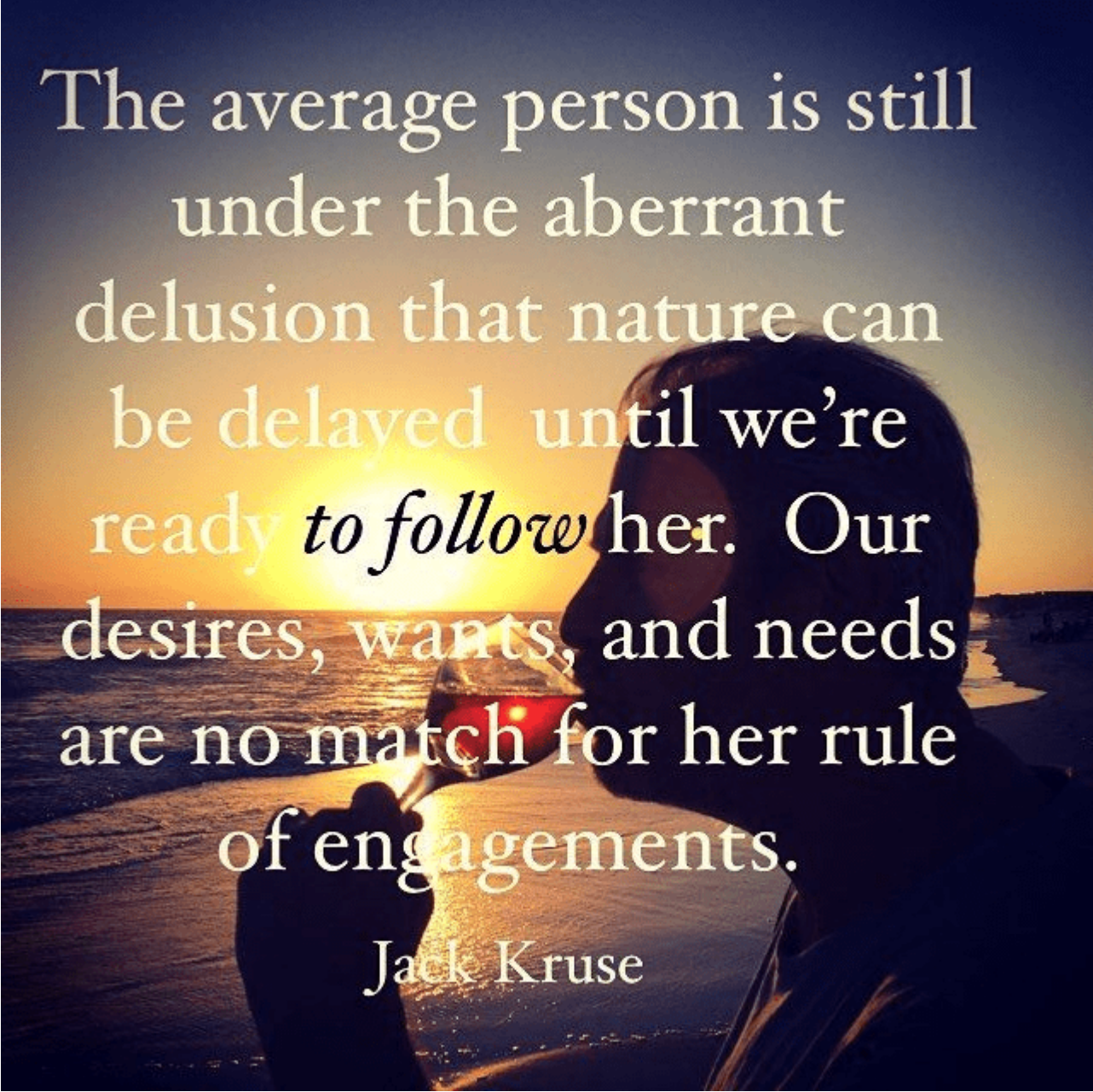
Sure, more and more health gurus are talking about the environment today, and yet, they were not the *first* who introduced this information to a broader audience. It's easy to lose perspective of history after the fact.

A few years ago, my life was affected by that paradigm shift as well, and I started introducing cold exposure and sunlight into my life.

At first I was stubborn, and continued training a lot for a few years, until I finally gave up my 6 days a week 1.5 hours a day gym routine that was far excessive – Dr. Kruse was one of the persons who inspired that change.

“Exercise more” was replaced with a more nuanced view (I never fully brought into the the “eat less” part of the “eat less, exercise more” equation)

So now that you know my story, let's move on to the actual biohacking – or “mitohacking” as Dr. Kruse calls it, signifying the enormous role of mitochondria in health.

A silhouette of a person holding a wine glass against a sunset over the ocean. The sun is low on the horizon, creating a bright glow that reflects on the water. The person's profile is visible in the foreground, looking towards the sunset. The text is overlaid on this image.

The average person is still  
under the aberrant  
delusion that nature can  
be delayed until we're  
ready *to follow* her. Our  
desires, wants, and needs  
are no match for her rule  
of engagements.

Jack Kruse

## **BIOHACK 1: CONTROL THE LIGHT IN YOUR ENVIRONMENT**

I started integrating more sunlight into my life after listening to Dr. Kruse in 2014. I also began blocking harmful artificial light at night. My sleep and recovery, thinking ability, and energy levels instantly shot up.

Fortunately, I had already enjoyed the sun for *many* years before that. Dr. Kruse nonetheless convinced me to start using sunlight more extensively, year-round, even in the wintertime

which I had not previously done.

**Controlling the *light* in your environment is the most important biohack many people will carry out in their lifetime.**

Light is far more important to human biology than many people think. For *millions* of years, every human ancestor you had rose with the sunlight in the morning, and went to bed after sunset.[20]

Only since the invention of the electric light bulb by Thomas Edison in 1879, has it become possible to add massive amounts of new light to the human environment, even at times that light was not naturally present.

Sure, before the mid-19th century, oil lamps, fires, and candles were used as late night lighting. But you can easily claim that such lighting sources do not *break* with the (pre-)historical precedent.

Your ancestors used red and infrared light for a long time before 1879.

The best dating of the intentional control of fire is around 800,000 years ago.[22] Keep in mind that humans only transitioned away from primates more than 2.5 million years ago, so there's also a long time your ancestors didn't have fire.

Fire, candles, and oil lamps almost exclusively put out *red* and *infrared* light. At low intensities, these light sources do not affect your circadian rhythm the way modern lighting does.[22]

The circadian rhythm is an internal clock in your body which I'll explain in more detail later. If you *do* expose yourself to intense red and infrared lighting sources late at night, such as an infrared sauna or with red light therapy, your

circadian rhythm *will be* influenced.

The light environment has thus been subtly changing the last millions of years, but was *dramatically altered* with the invention of the light bulb. That 19th century revolution continues till today.

**And while light is massively important to your overall health, most modern humans ignore that effect.**

How do I know?

Simple:

Nobody thinks it's strange a plant isn't growing if it's completely left in the dark 24-7. But most humans don't spend one second thinking about how the light environment affects them.

People also don't think how their lighting environment has changed, even though they know that institutions, technology, and lifestyles have massively changed in the last centuries.



So let's consider modern lighting: indoor light intensities can be 100 to 1,000 fold lower than outdoor.[23] You're thus not getting the light exposure your ancestors were getting when they were living outside.

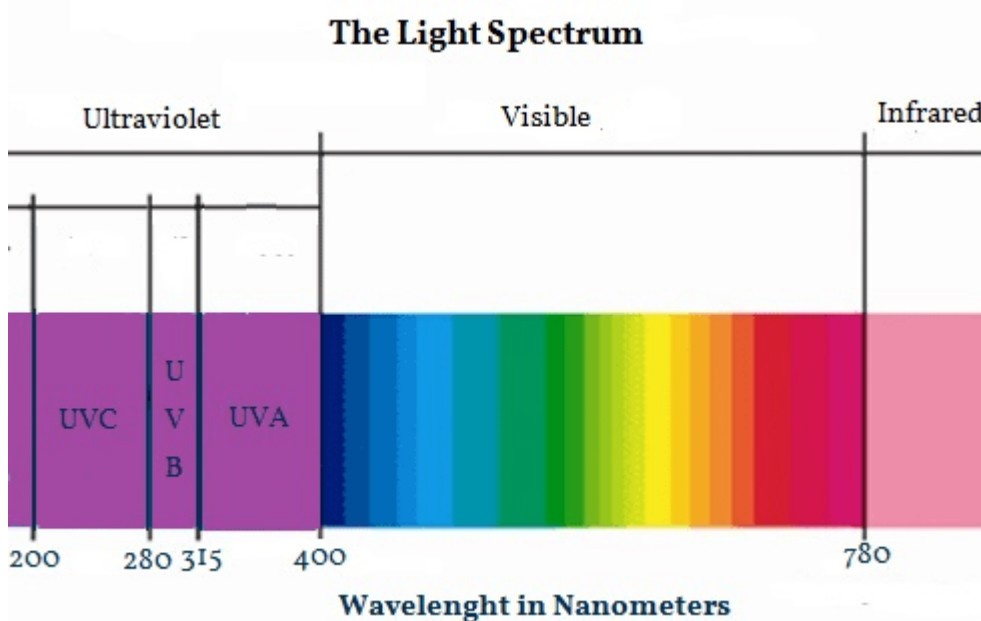
For most of human evolution up until your grandfathers less

than 10 generations ago, everyone was outside during most of the daytime. Factories changed that dynamic.

That observation thus shows another cognitive dissonance in the human mind, as the knowledge that an absence of light should logically be extended to humans as well.

**You may think: “but exactly how does modern lighting affect your health?”**

Watch the light spectrum below:



Observe that three different categories of light exist on that light spectrum: 1) ultraviolet light; 2) visible light; 3) infrared light.

Modern lighting, such as fluorescent and LED bulbs emit unprecedented amounts of *blue* and *green* light. Blue and green light are found in the visible spectrum.

For millions of years, these two types of light have only been present in the human environment through sunlight – hence through *daytime* exposure.

Blue and green light is that they tell your brain it's daytime.[24; 25] Getting that at nighttime will have negative

health consequences.

Blue and green light affect your brain when they enter your eyes, and though many intermediary steps influence a area in your brain called the “suprachiasmatic nucleus”. That suprachiasmatic nucleus is finally responsible for registering that impulse.[26; 27]

The suprachiasmatic nucleus is like an atomic clock that keeps time for all other clocks in your body. These *other* clocks are the cells (and they’re thus *peripheral* clocks).

For the atomic clock to work correctly, it needs to run a ~24 hour cycle.[28] Sunlight exposure traditionally ensures that the clock is running in sync with nature.

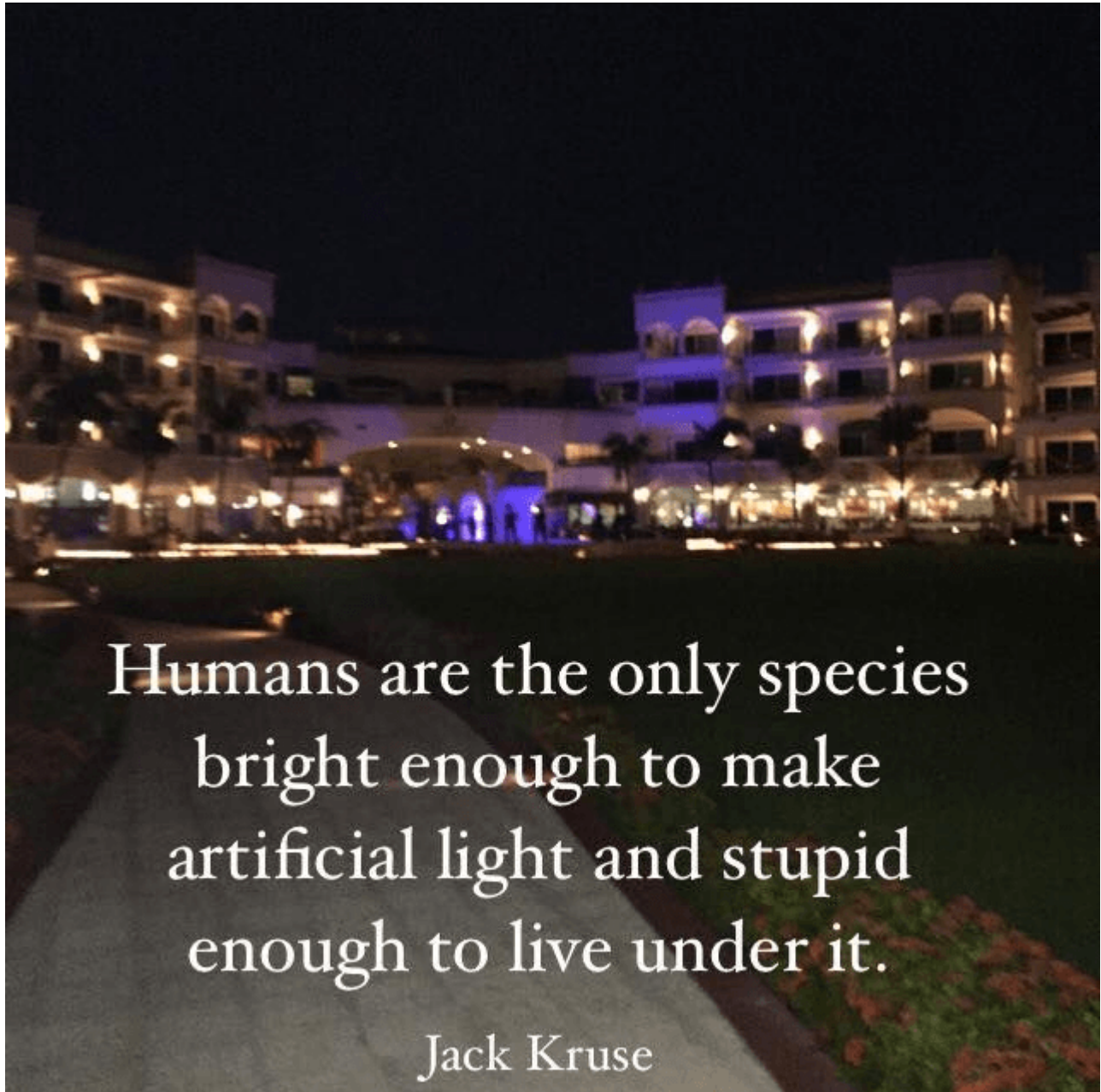
Artificial light at night *simulates* sunlight exposure (imperfectly) at the wrong times of the day.[29] As an analogy, that mismatch thus causes that atomic clock to display an improper time.

It’s easy to imagine that continually changing the display of the atomic clock creates chaos in the overall system: the central clock will no longer be in sync with all the other clocks in your body.

If an atomic clock were continually changing in physics, technologies such as GPS and merely communicating time to others would be unusable. If two people make an appointment while having different times on their watches, the appointment can only succeed by accident (if uncorrected for).

In the same way, with a continually changing display on the atomic clock in your body (suprachiasmatic nucleus), the peripheral clocks in your cells will also be off as well.

The end result is chaos.



So let's consider how to *actually solve* the issue:

## **Why sunlight is necessary for optimal health**

Each morning, make sure to have bright light shining into your eyes. Sunlight is your best option for light exposure.[30]

Not only will the clocks in your body get *correctly* entrained, as I talked about before, but you'll also increase your dopamine levels. Dopamine is a signalling substance in the brain, which levels increase due to ultraviolet light

exposure.[31-33] Ultraviolet light (UV) is the purple color in the light spectrum picture above, but is invisible to the human eye in reality.

Jack has talked extensively about the role of sunlight in human health, so I won't go into detail here. I've only included this argument to demonstrate that the *environment* is massively important for health.

For more info regarding the role of sunlight in health, I highly recommend checking out his Nourish Vermont 2016 and 2017 talks on sunlight, which are precursors to his 2018 talk.

**And while individual differences exist, every single human being needs sunlight exposure for optimal health.**

*Can you get away with sitting inside each and every day for 3 decades? Sure. But will you get away from the health consequences of sitting inside for 3 decades? No. With sunlight exposure you'll always be healthier than without sunlight exposure.*

The relationship between sunlight exposure and health is clearly demonstrated during the last few years, in which an inverse relationship was found between the amount of sunlight exposure you're getting, and "all cause mortality".[33; 34]

All cause mortality is an *aggregate* of your general risk of dying, whether that's from a stroke or car crash. Anything that lowers all cause mortality thus makes you life longer, even though it's not specified *how* in the statistic.

Sunlight exposure may reduce your stroke risk, for example, but also your risk of dying in a car crash, because you're sharper and better able to prevent that problem.

So let's move on to the second solution:

## Why you need to wear blue blocking glasses

Blue blocking glasses are *essential* in modern society – nobody should be without, unless you're living far away from civilization.

Why?

Recall you want to avoid blue and green light exposure at night. High-quality blue blocking glasses prevent that blue and green light from entering your eyes.

(For the high-quality blue blocking glasses that nonetheless *look incredible*, visit <https://raoptics.com/> and use code "OPTIMAL" for a discount.)



Because your eyes will experience darkness at night with blue blocking glasses, a hormone called "melatonin" is produced in greater quantities in your brain.[35; 36]

More melatonin equals deeper sleep at night, combined with quicker recovery.

50-70 million Americans actually sleep very poorly at night.[37] I estimate that at least double if not triple that number have *sub-optimal* sleep. Very few people are thus sleeping perfectly, and light exposure at night is one main

reason for that outcome.

And there's more:

## **Biohacking light with healthy indoor lighting**

The explanation why most indoor lighting is *complete crap* is simple: engineers only focusing on integrating *visible light* in fluorescent and LED bulbs. That choice entails that you're never getting exposed to ultraviolet and infrared light if you're indoors.

The old fashioned incandescent bulbs invented by Edison at least projected lots of infrared light as well. That infrared light is removed now to increase "energy efficiency".

**Removing all infrared or ultraviolet light from your environment is just as unnatural as no longer moving your arms and trunk, while carrying all bodily movement with your legs.**

What's even worse is that the effects of modern lighting sources don't get much funding – exclusive visible light exposure is thus tacitly *assumed* to be safe.

And sure, your electric bill will go down with such LED indoor lighting—but your medical bill goes up over time as well.

Let me give you one example why you need full spectrum indoor light. Ultraviolet light can dilate blood vessels, lowering your blood pressure in the process, and also produce "endorphins" which make you feel great.[38; 39] That light also helps produce vitamin D, which many people are shockingly deficient in.

With the right amount of UV light exposure, risk of getting illnesses (such as heart disease) goes down. And because mood improves, the pandemic depression and anxiety problems in developed countries can be countered as well.

**Bottom line: it's not safe to assume that you can stay indoors under artificial light all day, and not suffer the consequences.**

Moving on:

## **BIOHACK 2: MIND THE AIR YOU'RE BREATHING**

Yes, really.

Air pollution is a massive problem in modern society, and has *yet* to be curbed. *Millions* of people die each and every year as the direct results of air pollution.

No, that's not a typo.

And yet, most people don't worry *at all* when they're breathing in bad air day and night.

And if you think: "*well, air pollution pollution is mainly a problem in China and India*", then you're only partially right. These countries do have bigger air pollution problems than the West. What you might not know though, is that mortality numbers due to air pollution in the West remain shocking as well.

So let's consider some figures:

- Up to 20,000 people die in the United Kingdom each year due to an air pollutant called "nitrogen dioxide" (NO<sub>2</sub>). By generalization, you could guesstimate that the same substance would kill at least 100,000 people in the entire European Union every year.[1]Nitrogen dioxide is emitted as a byproduct of power generation and transportation (cars). NO<sub>2</sub> has horrifying health effects, increasing your all cause mortality, risk for cardiovascular disease, and overall cancer risk.[2-5]

- The effects of particulate matter are even worse. Particulate matter are tiny particles, much smaller than a human hair, that are emitted in the air due to industry or traffic. Take the US as an example: about 71,000 people still die every year as the *direct* effects of inhaling toxic air.[6] That's 1 in 35 deaths. That figure is *double* the number of people dying of gun violence in the US, and yet, there's no outcry that "one life is too many lives" in that case. Making matters worse, hundreds of millions of Americans don't die outright because of the health effects of air pollution, but their health still worsens. That worsening health is not taken up in these mortality statistics. If you're young and breathing in low quality air you're still suffering the consequences, even though they're imperceptible to the human sensory apparatus.

The phone that you hold in your pocket (that's not in airplane mode) is the same: the damage is like an imperceptible poison drip that slowly damages your health over time.

So how does particulate matter damage you? The substance is taken up directly into your lungs and bloodstream, and ultra fine particulate matter may even enter your brain directly, by entering your brain nerves connected to your nose.

Shocker:

Even stress hormone levels such as cortisol are immediately affected by the particulate matter you inhale.[7] Hence, particulate matter is no bueno.

- VOCs, thirdly, are gases emitted from solid substances. Furniture is an example of an object that often emits VOCs – gasoline or solvents can create the same problem. Indoor VOC levels are generally higher than

outdoor levels, with a 2-5 fold factor.[8; 9]Avoiding VOC exposure is almost unavoidable in modern society, as adding gas to your tank already makes you inhale that stuff. At lower exposure levels, you may get a sore throat, skin and eye problems, and you may feel lightheaded. Higher exposure levels can lead to organ failure and cancer.

But let's look on the bright side:

**The better your overall health, the less damaging air pollution will be, and the more air pollution you'll be able to handle**

As a 20-year old kid, you can probably run a few miles through Los Angeles and be just fine. As a 70-year old with lung problems, running through that city may leave you coughing for the rest of the night.

(Running requires faster breathing, and thus increases uptake of air pollutants.)

So what's the solution? Here are three options:

## **Get an air purifier**

Sure, your best bet would be to avoid metropolitan cities with huge population densities, especially in the developing world.

Your second best bet, however, is to buy an air purifier to filter the air you're breathing. Ventilating a building inside a huge city isn't a solution, simply because you'll be bringing new toxins indoors.

A mid-sized room can already be filtered with a \$100 – \$250 air purifier. Avoid placing that air purifier directly next to your desk or bed, as non-native EMF exposure becomes dangerous with closer proximity.

With a high-quality air purifier, you can reduce pollutant

levels with 90%. Keep your windows closed most of the time when you're using an air purifier, and make sure to replace filters as prescribed.

But how will you get fresh air?

Open windows *some* of the time, to let fresh oxygen come in. Additionally, that's where the second air strategy comes in as well:

## **Breathe cleaner air with vegetation**

The more plants you use in and around the buildings you're spending time at, the less you'll be exposed to air pollution.

Covering your rooftop with pines, for example, can remove up to 90 kilograms (200 pounds) of pollutants from the air in a single year.[10]

If there's a busy road nearby, it's recommended to build a "living wall" around the perimeter of your house, so that fewer pollutants reach your home.

Yews and ivy's also have very high filtering capacities, as long as they're really dense. One main filtering mechanism of vegetation is that it captures pollutants mechanically, removing them from the air so that they're no longer swirling around while being able to enter your lungs.

Other mechanisms exist as well that I won't go into here. To ensure that pollutants are fully removed from your environment, I recommend using a (HEPA) vacuum cleaner on a low setting around indoor vegetation.

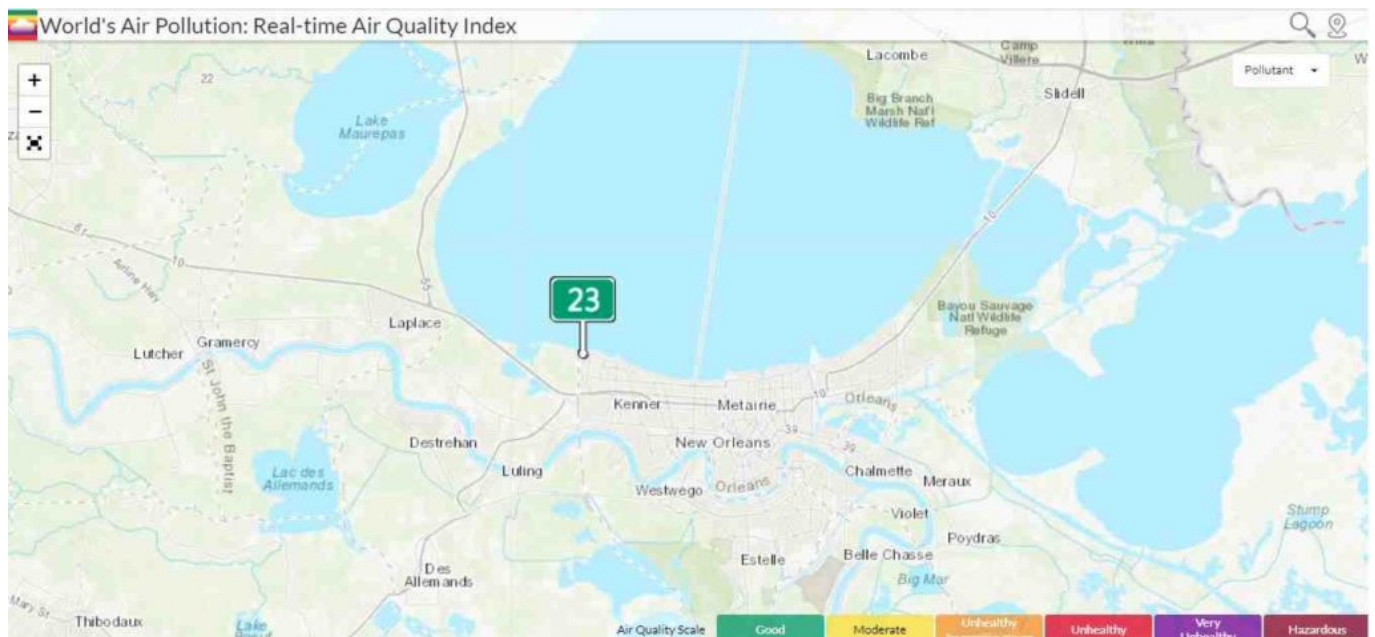
Bottom line: more vegetation equals less exposure to toxic air. Let's move to the last air pollution reduction strategy:

## Use common sense

Fortunately, common sense still functions in 2019 (and not just in 1776). With regards to air pollution, common sense entails that you're avoiding the most pollutive areas.

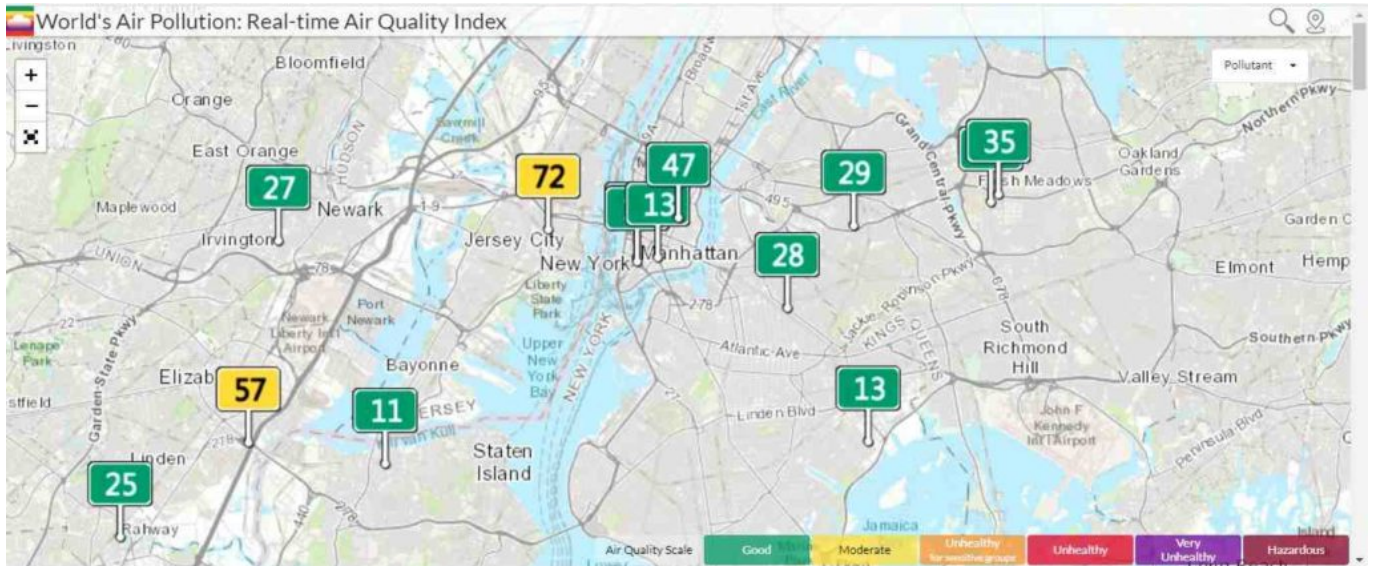
Looking at the following Air Quality Index map should give you a good impression of how polluted your environment is. If you observe that map several times a day for a week, you'll get a good grasp of how big of a problem air pollution is in *your* environment.

As an example, here are the air pollution levels of New Orleans, Jack's home city:



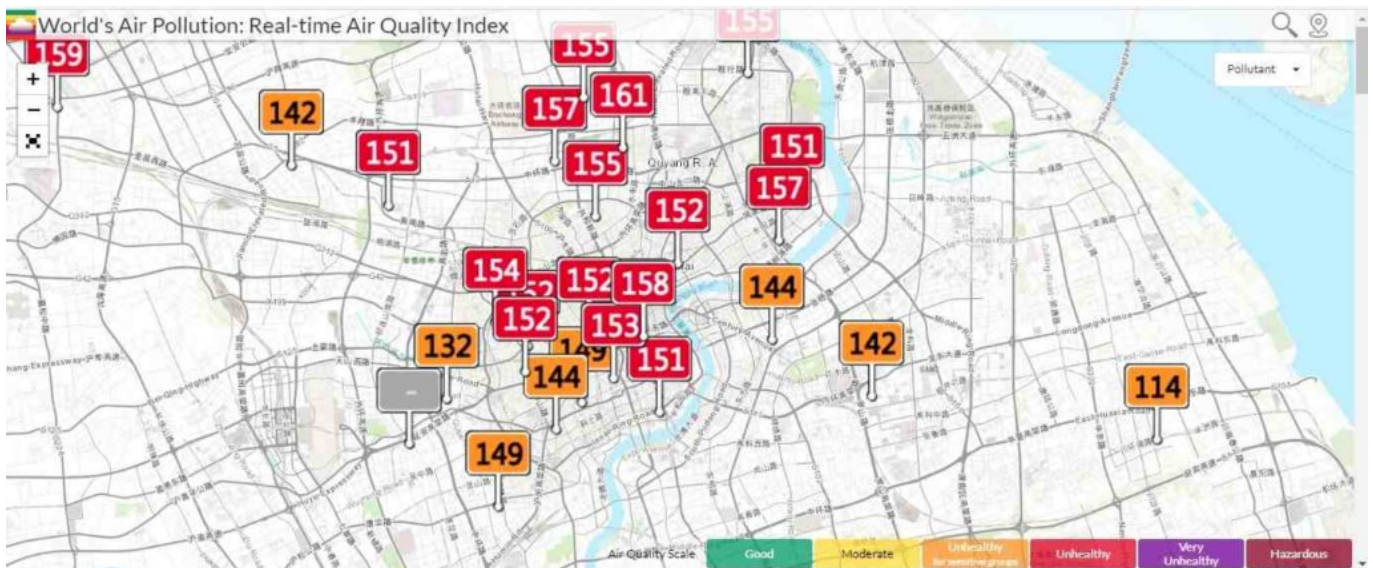
(For clarity: the greener the labels, the safer the air. Yellow, red, and especially purple denote high(er) pollution levels).

And here's the air pollution in New York City:



NYC is the city Jack grew up in, not quite as good in terms of pollution. Jack has thus improved his circumstances in this regard.

And to understand the problem in developing nations, let's consider Shanghai:



The colors speak for themselves...

If I were living in Shanghai, I'd go as far as wearing a respirator when traveling through the city. When I captured the image of the air quality index, the city was probably filled with smog, going by the looks of the map.

Moreover, the map listed above can even be used to determine

where healthier places to live inside are, and which places are unhealthy.

If you want certainty, however, I recommend consulting with an expert and getting live readings on your living and working locations.

I'd also recommend you don't exercise in Shanghai at that time because you'll be breathing in tons of polluted air. Venture outside the city, and perform your exercise there, then move inside again so that you can breathe purified air.

Please keep in mind that I'm oversimplifying here. I'm by no means implying that you should *always* breathe highly purified air, for example. The air in nature, such as in the woods, is probably best, because it's relatively clean but also contains many compounds that may have health benefits compared to purified air.

Let's now move on to one last instance proving that the *environment* plays a huge role in health:

## **BIOHACK 3: CONTROL THE SOUND IN YOUR ENVIRONMENT**

Many people aren't that aware of the sound in their environment unless sound becomes *noise*. From that instant, you become painfully conscious of every single transgression to your peace.

What many people don't know is that noise pollution is nothing new, and as old as human civilization. During previous millennia, your ancestors have thus also been "biohacking" noise to improve their health and performance.

The Ancient Greeks, for example, didn't allow certain professions to be carried out within the city walls.

**What many people also don't know is that noise isn't just a nuisance—it's yet another poison drip.**

So let me first sketch a little background so that you can understand noise. Noise is commonly measured in decibels (dB), and although different types of dB measurements exist, I'm going by the most basic one of maximum sound level.

The dB scale is *logarithmic*, and not *linear*. Let me explain the difference with an example:

A rural area commonly has a sound level of 30 Decibels (dB). When you're standing near a passing car, you'll get exposed to 50 dB of sound. Music with average loudness approximates 70 dB, and an overflying airplane hits 90 dB.

Now, due to the logarithmic scale, loudness does not increase 3-fold from 30 to 90 dB. Instead 1,000,000-fold, or one million times. A dB increase of 10 thus leads to a 10-fold increase in sound level.

Why don't you perceive that huge difference in loudness?

Well, nature has fortunately equipped you with ears that can hear within a very broad sound range. Problems emerge, however, due to the *biological health effects* of sound pollution.

And as you know, metropolitan cities are hotbeds of such loud noise.

To give you some perspective: sound levels of just 65 dB can already damage your health, if you're exposed long enough. That 65 dB is problematic because you're regularly exposed to 100 dB in a subway and 130 dB at a football match in a stadium.

Once again, an environmental influence such as noise pollution is much more common than you'd initially think.

Even in the 1980s, 100 millions of Americans were exposed to excessive noise – that number is probably higher today. In the European Union, 125 million citizens living are exposed to excessive noise.[11; 12]

Nighttime noise is especially damaging, and 1 in 5 inhabitants of the European Union lose sleep directly due to noise pollution *every single night*.

Noise is thus not a “side issue”.

Living close to an airport, street, or industry are reasons for 24-7 exposure to loud sound. Noises above 40 dB already inhibit sleep quality, and hence, the threshold for damage is very low.[15]

Result?

With noise exposure you’ll get a surge in stress in stress hormones such as cortisol and adrenaline.[13; 14] The bad news is that the threshold for that stress hormones surge is located at 60 dB – your mother in law *may* thus kill you, just not the way you think.

Other negative health effects of noise exist as well, such as oxidative stress and an increased heart rate.[16-18] Additional risks associated with noise pollution are heart disease, anxiety, stress, chronic inflammation, hearing loss, fat gain, an impairment of the immune system, and increased stroke risk.

Not fun!

So what can you do about the problem? Again, biohacks, or better yet, mitohacks, as noise also directly affects mitochondria:[19] Let’s move towards the solution one more time:

## **Earplugs as a life (or sleep) saver.**

You need to sleep at night, and wearing earplugs in loud environment is my most important biohack.

20 pieces of high-quality earplugs only cost you \$5, or \$0.25 per night. I assure you that one sleepless night is far costlier than a \$100, even if you're not earning lots of money.

Why?

Well, after losing sleep due to noise one night you're pretty useless the next day, and very prone to make mistakes that have long-term negative consequences. Those listed earplugs above are tested for 33 dB, entailing more than a 1,000-fold decrease in noise you're exposed to.

Not dramatically decreasing the noise problem with earplugs is thus insanity. If you're regularly having problems with noise, I recommend getting a pair custom made for you.

If earplugs are not enough, you can insulate the room you're sleeping in. Acoustic panels are a simple option to reduce sound, and noise-blocking curtains also exist. And if these options don't work, then;

## **Focus on location, location, and... location.**

Is the sound of the drilling machine or lawnmower *impossible* to ignore? In that case, try sleeping in or moving to another room.

The difference between the amount of noise that penetrates into rooms can be significant, not only because some rooms are closer to the noise pollution source, but also because different rooms may be constructed differently.

Different construction types affect noise penetration levels. With thicker walls, for example, noise penetration almost always goes down. Just closing your windows (temporarily) also massively improves annoyance levels.

These beautiful trees I've talked about before, moreover, can also block tons of noise from entering buildings. For the best noise-blocking effects, make sure the vegetation is multi-rowed and tall.

Dense plants of multiple rows can reduce noise levels up to 15 decibels – a more than 10-fold decrease in loudness.

You're thus not helpless by any stretch of the imagination.

## **Other strategies for compensating for noise**

Overflying airplanes while you're living in a flat? No ability to alter your life in such a way that noise levels are reduced well enough?

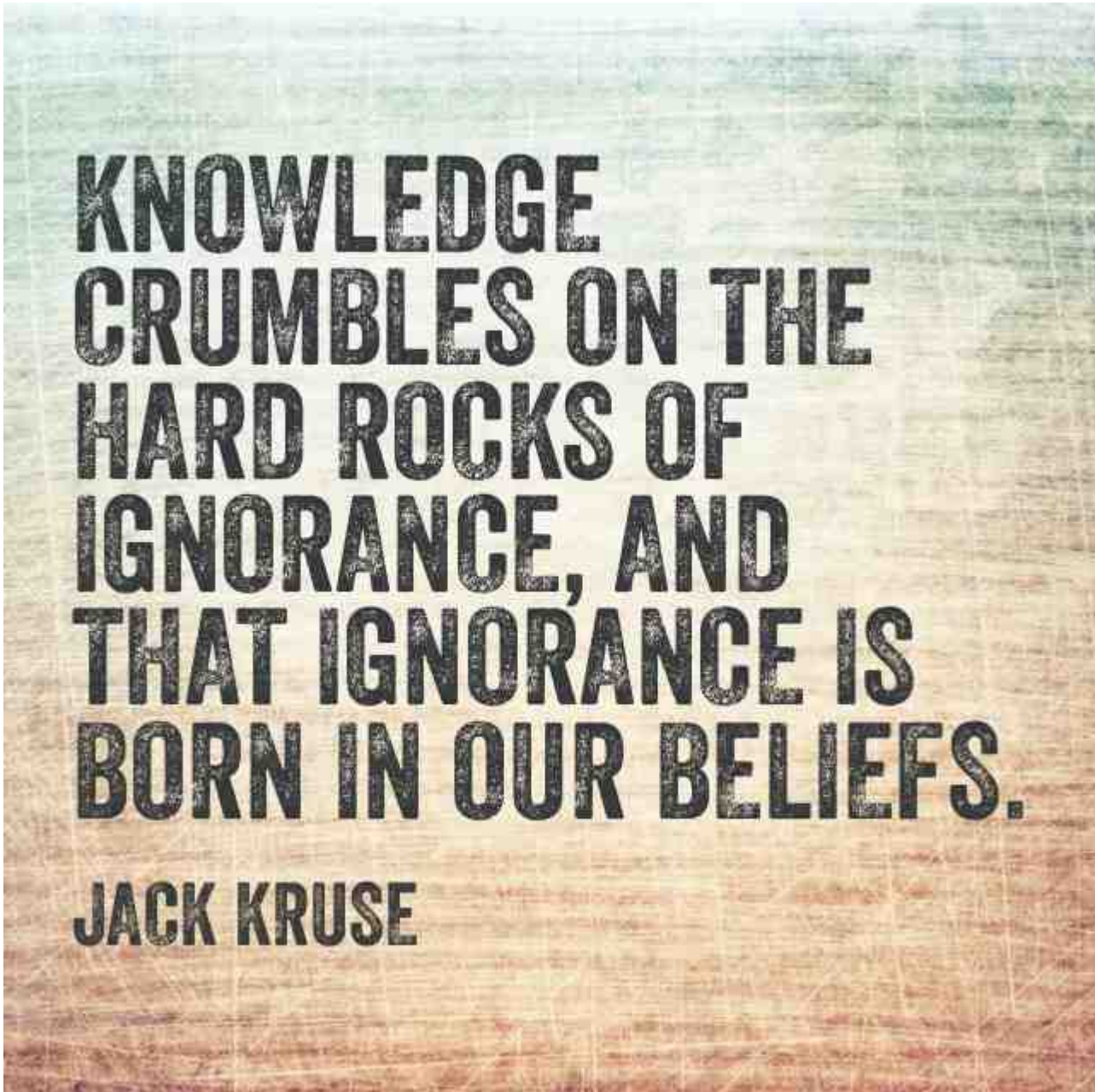
In that case, plan on moving to another location permanently. Such a choice is tough but necessary sometimes.

Surely, you *can* live in many environments, The question is always: "*should you?*", and the answer to that question is that *some* places are simply not worth the risk.

If you're struggling with stress every day due to noise, it's probably best plan moving to another location.

Bottom line: noise problems are health damaging, and yet, rarely emphasized in any health advice.

**My point with the examples of light, polluted air, and noise? Some battles cannot be won until you change the environment, which is precisely my argument in this blog post.**

The image features a quote by Jack Kruse set against a background with a vertical color gradient from light green at the top to light brown at the bottom. The text is in a bold, black, distressed font. The quote reads: "KNOWLEDGE CRUMBLES ON THE HARD ROCKS OF IGNORANCE, AND THAT IGNORANCE IS BORN IN OUR BELIEFS." Below the quote, the author's name "JACK KRUSE" is written in the same font style.

**KNOWLEDGE  
CRUMBLES ON THE  
HARD ROCKS OF  
IGNORANCE, AND  
THAT IGNORANCE IS  
BORN IN OUR BELIEFS.**

**JACK KRUSE**

Don't assume my treatment of the topic is exhaustive though, as many other options exist as well – let's quickly go through a few:

## **OTHER ENVIRONMENTAL BIOHACKS**

The story only starts with the domains I've just laid out.

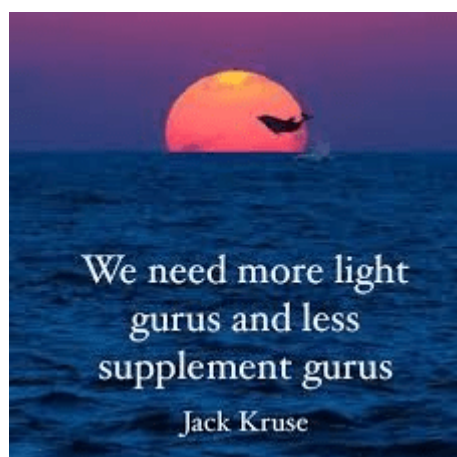
Dr. Kruse, for example, has written extensively about non-native EMF such as the expected health consequences of the implementation of 5g that's currently underway worldwide.

(If you'd like to learn more about 5g, specifically how to mitigate the negative health effects, check out Jack's Patreon blog and learn about his unique perspective on the topic.)

Cold thermogenesis is another example that highlights the importance of environment.

And again, I'm not saying that biohacking *only* has to do with the environment – that would be a stupid position to uphold. What I'm claiming instead, is that in 90% of the cases any analysis of why health problems emerge should *start* with analyzing your environment.

Now you understand why pushing essential oils sets such a dangerous precedent, and why Jack often talks about this topic:



**So if you're living in a noise and air polluted city that doesn't get any daylight, then it becomes exponentially harder to heal.**

Change your environment, and you may remove the reason you'd become sick (or couldn't heal) in the first place.

**The key to understanding the role of the environment is to observe how much it has changed in the last millennia.**

Only a few hunter-gatherer societies live in an environment that is similar to your human ancestors 50,000 or 1,500,000

years ago.

In such environments, sunlight is present *every single day*, and sunlight sets the pattern of the day for hunting, relaxing, and sleeping. Noise and air pollution are not present in great quantities either.

Of course, exceptions to the rule always exist: periods of volcanic eruptions would have exposed your ancestors to more particulate matter, but the same is true for modern humans as well.

The truth is that poor air or sound environments were not present 24-7 for your ancestors. In fact, just listen to the sounds of plants, water, and animals in nature, and you'll start relaxing – which illustrates the your evolutionary blueprint is still present in you today.

So let's compare that ancestral environment to that of modern humans:

## **AN IMPLICIT CRITIQUE OF CITY LIFE?**

Many people think city life is the pinnacle of “civilization”, but I hope you're realizing that vision is short-sighted.

People become sick earlier than ever before, and the number of people with multiple diseases is going through the roof. Sure, modern medicine can keep you alive for another 50 years if you become diabetic around your 30th birthday.

But given the choice, merely *living* is not enough for most people, they'd prefer to *thrive*. And the previous three biohacking areas I covered show precisely *most problematic* in city life, but also highlight the way out.

Take New York City as an example. The possibility to get sunlight on your skin is radically reduced in Manhattan.

First of all, sky scrapers block sunlight from getting on your skin in the first place. And secondly, the air pollution interacts with sunlight, blocking up to 50% of the sun's ultraviolet rays from reaching your skin.[56]

The tremendous number of cars also causes air pollution problems that you'll never see in any rural area. And last but not least, those cars and population density also create a sound pollution problems unheard of in the history of "civilization".

Dr. Kruse has often spoken about the problem of population density. Knowing the effect of your ZIP code on your health is just as important as knowing your genetic code, and may in fact be *more* important in many cases.

There's a reason Dr. Kruse doesn't visit New York City for long periods of time anymore, even though it's his home town from when he was a kid. That fact alone should tell you something about the importance of the environment for health, instead of merely considering food.

So is biohacking all about your environment? No. In fact, I'll give you a bonus for having read this far into the blog post:

## **BONUS: YOUR BIOHACKING JOURNEY AFTER FIXING YOUR ENVIRONMENT**

Of course, many other biohacks exist, but I'll quickly go over some examples right here:

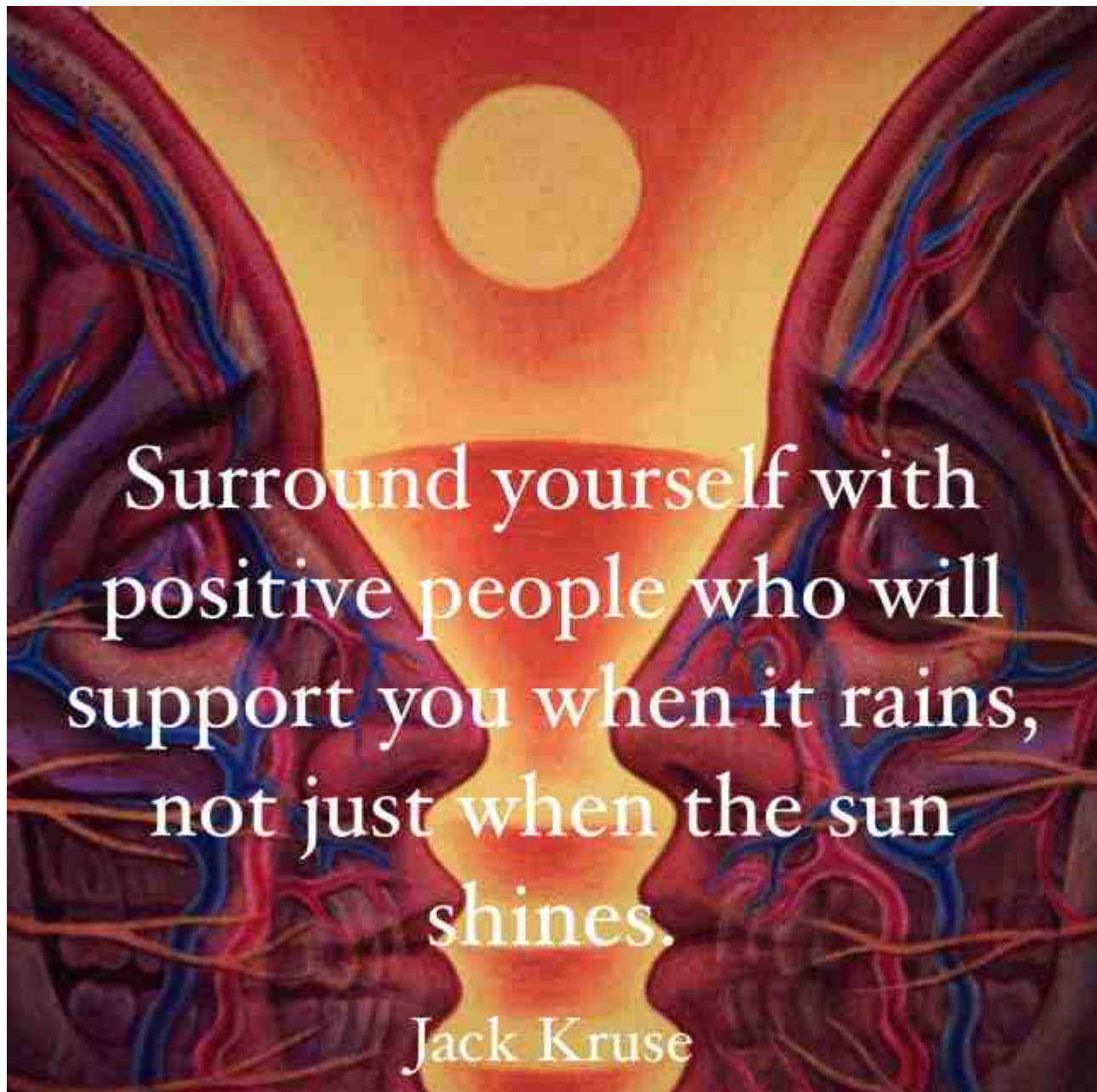
- **Eat a better diet.** Many people eat inadequate amounts of nutritious foods. Jack's own Epi Paleo diet is an approach that emphasizes foods that contain the highest amounts of vitamins, minerals, and essential fatty acids such as DHA. Few people realize this, but Jack's diet is really close to the carnivore diet (with some strategic alterations) that is popular right now, even though it

was created many years ago.

- **Drink better water**, specifically unfluoridated water. Fluoridated water displaces iodine in your body, and lowers your ability to generate electricity (your body does not merely function on chemical reactions, but fundamental physics processes such as electricity also play perhaps just as an important role as well).
- **Spend more time in nature**, such as in the woods or close to water. Both instances have been proven to decrease stress variables such as “heart rate variability” and blood pressure.[40; 41] Even mood improves, feelings of anxiety and anger are inhibited, and fatigue decreases. The examples of water and forests are another support for the thesis that changing your environment is the ultimate biohacks
- **Meditate** to reduce stress, improve focus, sleep better, gain clarity, and become happier overall.[42-45] That’s right. You’ll only have to learn the correct technique once, and you can keep practicing for free for a lifetime.
- **Use music to your advantage**. I don’t need need to cite studies to convince you that music can have a huge influence on your state of mind. The right music at the right time is golden.
- **See your friends more often** (a tip I currently fail at, in all honesty, and working on). Friendships are enormously important for your overall health.[46-48]
- **Being more grateful** (or better yet: happy) with what you have is yet another one. You may not believe me, but a huge amount of evidence shows that keeping a gratitude journal increases overall happiness levels.[49-51] Gratitude makes you focus on being happy with what you *already have*, and using what you have to your best advantage. The opposite of gratitude is to dream about what you need to be happy, and thus about what you currently *lack*, which produces an unhappy state. THIS journal can be used for integrating a gratitude habit

into your life. Buy that journal once until you get the process, and continue using the habit on normal paper after you're through your journal.

**Get shit done without distraction.** Japanese call that process "ikigai", which signifies a fusion of what you love and what you're skilled in, with what the world needs and what you can be paid for. Getting paid for what you love and what you're good for hours on end will move you into a flow state that increases both pleasure *and* happiness.[52; 53] Flow state and focus are the antidote to the distracted social media society.



Thousands of other examples exist, such improving your sleep quality. Try taping your mouth at nighttime, for example, so that you properly learn to breathe through your nose, or put your bed at an incline for circulation benefits.

Your imagination is the limit. I even recommend integrating sex into your biohacking routine (I'm sure Dr. Kruse can give you a Rx for this).

That's it: a basic intro into biohacking. So let's conclude and consider the 30,000 yard view:

## **CONCLUSION: WHY BIOHACKING STARTS WITH YOUR ENVIRONMENT**

I'll demonstrate the importance of the environment for biohacking with a detour:

Everyone knows that the human food supply has massively changed over a little more than 100 years.

Only in the 20th century was it technologically possible to remove the brain and germ from grains, so that you'll end up with white flour. After the Second World War, the food industry combined that white flour with toxic vegetable oils and many additives to create food that's both highly addictive and low in nutrients.

The fact that foods need to be fortified tells you about how nutrient-dense such foods inherently are. It's funny how foods like oysters and liver don't need to be fortified, which then functions as an implicit admission that better human foods exist.

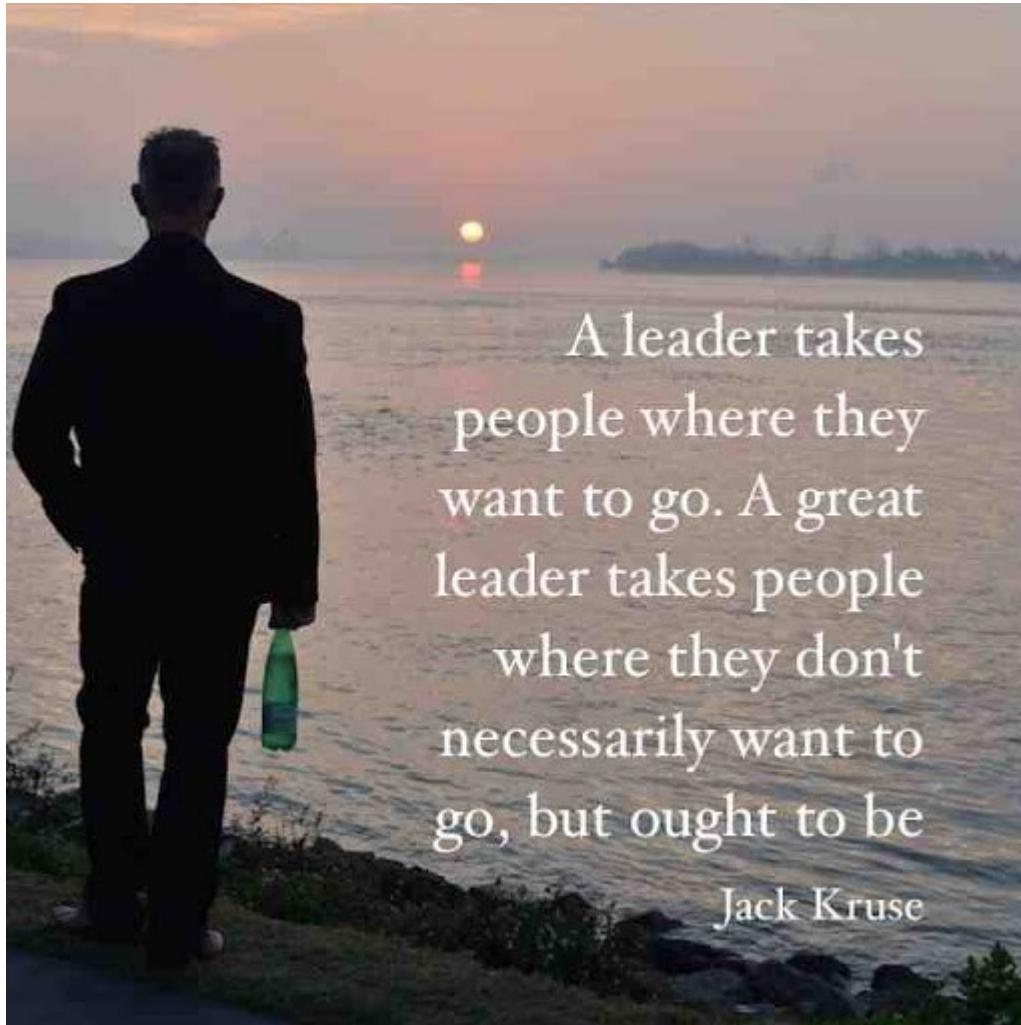
And yet, the change in food is hardly comparable to how human environments have changed. The first skyscraper was only built in the 1800s, setting a trend of allowing less sunlight and more noise into human lives.

Air pollution started 50 before that, and fortunately the problem partially reversed since the 1970s. But since the 70s, the IT revolution began a push to introduce many new devices into your home, eventually leading to `smart` televisions and phones that make you sick.

That technology is part of the light pollution problem that's found everywhere in society.

Fortunately, that new unprecedented environment also holds the key to improving your health, and by observing that change the veil of civilization can be seen through.

To biohack, you must look at your environment. You and I are not human beings that are fully detached from nature—instead, you are part of that environment. Fortunately, nature has also given humans the best means to control that environment: the most highly-developed brain found across all species.



A leader takes  
people where they  
want to go. A great  
leader takes people  
where they don't  
necessarily want to  
go, but ought to be  
Jack Kruse

*To learn more about light, sound and noise, and air pollution read more of Bart Wolbers' work at <https://www.naturebuildshealth.com>*

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