

DIRTY FINGERNAILS AND ALL

Heavy metal is not music to my ears

BY SIOUX ROGERS

Wow, I found a new word: phytoremediation. Well, obviously only a new word to me as it is not new to the plants doing all the work nor to the industry studying this unique phenomenon.

"Phytoremediation (from Ancient Greek *phyto*, meaning 'plant,' and Latin *remedium*, meaning 'restoring balance') describes the treatment of environmental problems (bioremediation) through the use of plants that mitigate the environmental problem without the need to excavate the contaminant material and dispose of it elsewhere." (<http://en.wikipedia.org/wiki/Phytoremediation>)

It seems that plants have a secret society for harvesting heavy metals. There are several words used for this plant process. One is hyperaccumulators. If you don't understand this word, check out your garage, or your "mess" drawer or your clothes closet. Can you relate to the word hyperaccumulator now?

Do you realize that while industry is spending millions of dollars to de-weed and "perfectise" every green living space, the toxins that are added during this process are just making way for more weeds? Weeds become immune to toxins, just as bacteria become resistant to antibiotics.

While you are spraying toxins on the plants to get rid of them, you are actually damaging the soil. If left alone, some plants will—at no extra charge—remove toxins from your soil and make it healthier. Spraying with toxins is very short-sighted

and not the solution. In the long run, it is the problem.

Below are some of these hard-working toxic-accumulator plants, now used worldwide to clean up the mess we humans have created.

- "*Thlaspi caerulescens*, Alpine Pennycress and also known as Alpine Pennygrass, is a flowering plant in the family Brassicaceae. It is found in the Western United States, Scandinavia, and Europe" (http://en.wikipedia.org/wiki/Thlaspi_caerulescens).

Pennycress is a slow toxic avenger for soil remediation but gets the job done. Each plant used for the purpose of toxic accumulation does so at its individual rate.

- *Brassica juncea* and *Brassica carinata* are both in the mustard family.

In laboratory tests with metals loaded onto artificial soil (a mix of sand and vermiculite), these plants appear to be the best at removing large quantities of chromium, lead, copper and nickel.

- *Helianthus sp.*, a type of sunflower, is currently used by a New Jersey company to help clear toxic residue from Chernobyl.

Plants have removed as much as 95 percent of toxic contaminants in as little as 24 hours. Subsequently, *Helianthus* was planted on a Styrofoam raft at one end of a contaminated pond near Chernobyl and in 12 days the cesium concentrations within its roots were reportedly 8,000 times that of the water, while the strontium concentrations were 2,000 times that of the water.

- The Chinese brake fern (*Pteris vittata* L.) and related species are being studied as a possible way to remove arsenic from water and soil. Remediating arsenic-contaminated soil and groundwater using currently available engineering methods is costly and difficult. The ability of brake ferns to hyperaccumulate

arsenic in their fronds has led to the development of environmentally friendly and cost-effective remediation of arsenic-contaminated sites.

- Aquatic plants, of which there are several species, have the uncanny capacity to locate heavy metals in water and then remove these metals via their roots. I would like to think

this is as easy as sucking up an ice cream soda via a straw, but alas, not so. Some examples of these aquatic plants are water hyacinth (*Eichhornia crassipes* (Mart.) Solms), pennywort (*Hydrocotyle umbellata* L.) and duckweed (*Lemna minor* L.).

- The roots of Indian mustard are effective in the removal of cadmium, chromium, copper, nickel, lead, zinc, uranium, cesium and strontium 90 from hydroponic solutions.

An excellent reference for additional information is http://www.mhhe.com/biosci/pae/botany/botany_map/articles.

Phytoextraction by any plant, including aquatic species, is a sophisticated process. For our purposes, all we need to know is that it happens and is being further developed and utilized.

The obvious next questions are: what happens to toxin-laden plants after they have done their job and how do we dispose of them? The literature is not unilaterally decisive about a one-size-fits-all solution. The good news is that even though heavy metals are detrimental to soil and are ingested by humans in an overabundance, they have a positive usage in other applications. To offset the cost of the process of utilizing, monitoring, harvesting and disposing of phytoremediation plants, the heavy metals can be extracted and re-used.

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Alpine Pennycress helps clean toxic residue.



Gen Y Worldview

Yoga is for every body

BY JESSE HART

Though the popularity of yoga is growing rapidly in the western world, many people have applied only a western concept to a more universal spiritual and scientific practice. I am happy to be able to explain to my community the truth behind this ancient practice and why every human being should at least be familiar with its basic concept. After all, yoga in its fundamental sense is the practice of being comfortable in human form.

What is yoga?

This ancient spiritual science offers a direct means of stilling the natural turbulence of thoughts and restlessness of body that prevent us from knowing what and where we truly are. Translated, yoga means "union": of the individual consciousness or soul with the Universal Consciousness or Spirit (aka, your connection of yourself to your creator). Though many people think of yoga only as physical exercises—the "asanas" or postures that have gained widespread popularity in recent decades—these are actually only a superficial aspect of this profound practice of unfolding the infinite potentials of the human body, mind and soul. Yes, yoga will

help with flexibility, but the practice will also assist in an increase of balance and strength, both physically and mentally. Simply put, yoga is meditation and a workout combined into one.

Is yoga the right choice for you?

Short answer: Yes.

Long answer: Absolutely positively definitely yes. Get up and go for it right now. It will be the best choice you ever made!

Yoga is for all—the young and old, big and small, male and female, flexible and stiff (especially the stiff). Human beings perceive the world outside the body in the eternal moment of now. Our sense of what is happening around us and how we define things is in relation to the experience of our life thus far. It may seem counterintuitive, but what happens within our internal selves creates the perception (reality) of the external and never the other way around. When we lose touch with our inner self—our thoughts, feelings, internal organs, muscles and bone structure—we are allowing the health of the mind and body to lessen. When we are out of harmony internally, the external world

follows suit. In yoga we learn to create a new, healthy and enjoyable pattern of awareness. Right now, this may seem like quite a feat and perhaps you are many steps away from that goal, but in yoga we understand the truth and discipline of taking the first step, which, as it turns out, is *the only step that we ever take*, consciously or unconsciously, every moment of our lives. Learning new techniques to assist our consciousness will open up new possibilities in your life that you doubt or deem impossible.

What can I do to start?

You may not know it but you have already started. Perhaps during heightened stress or anxiety you reminded yourself to "breathe." Perhaps you suffered a physical injury and took a moment to massage or stretch the afflicted area. Though breathing and stretching are good for trauma, with some guided practice one can learn how to get greater benefit from these actions. Most of us are given lessons to learn to drive the vehicle that is our car, but few are given lessons to drive the vehicle that is our body.

To keep the body alive and well, we know to provide the bare necessities of food and water, but preceding this sustenance are the most needed commodities for life: breath and movement (with a sense of calm, yet energetic purpose). All living



The author practicing what he preaches.

creatures, from humans to animals, insects and plants, need what is called in yoga "prana" or "life-force" brought into the body through our breath. Our internal organs, respiratory and circulatory systems move and operate on their own, but we either learn how to assist them or let our functionings go the route of least resistance. I sincerely implore you to avoid the latter. Every cell in your body will thank you for the compassion.

Blissfully, I have recently come to find great comfort in discovering that a path to happiness, balance and connection with nature/universe/God/energy is not difficult. Discovering euphoria is as easy as learning to consistently practice the art of observing, stretching, balancing and allowing.

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