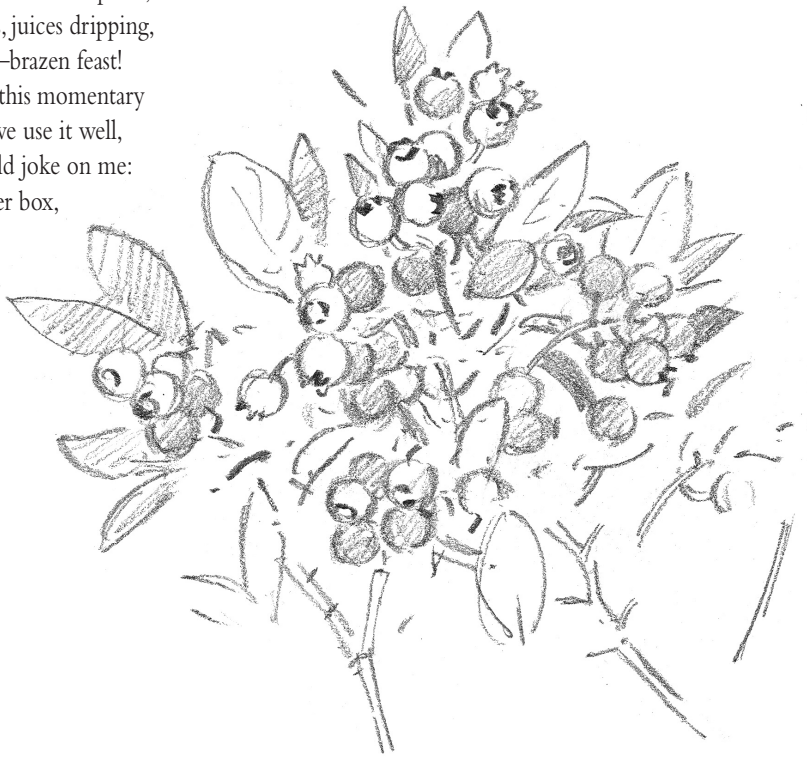
Ephemera

by Margot Wizansky

Just as the raspberries reach
their fragile fullness, and I've
armored myself, leather-gloved,
to pick among thorns, the wasps
beat me to them. I'm a voyeur—
the way the wasps take the berries—
each wasp a little cameo on deep red,
sucking the drupelets, juices dripping,
berry disintegrating—brazen feast!
It aches with beauty, this momentary
life, whether or not we use it well,
it plays us, like that old joke on me:
gift-wrapped box after box,
ribboned and glittered, nested
one inside the other, all empty,
even the last box—only the world
dangling before me, sparkling fine.



The Garden of Earthly Cures

Medicinal Plants Past, Present, and Future

by Teri Dunn Chace

How do plants help humans heal? A botanist, an ethnobotanist, a practicing herbalist, plant geneticist, native healer, or practitioner of ayurvedic or traditional Chinese medicine would all have varying answers to this question, each viewed through the lens of their respective fields. But the short answer is that plants contain compounds that ward off predators and infectious bacteria, fungi, and viruses. Apply topically or ingest certain plants and one may benefit from these same compounds. In effect, when we use plant-based medicinals, we are leveraging the plant's version of an immune system for our own benefit.

While it's not possible to know precisely when people first started using plants for medicinal purposes, suffice to say it's been a very long time. Some archeological research traces the beginnings back to 3700 BC Egypt. The inhabitants of China were also pioneers, as were the early Greeks and Romans. The earliest written accounts of herbal remedies are Chinese and date back to 2800 BC. Here in North America, there is also an extensive history of use of native plants to help and heal, but there are no written records.

Perhaps this is stating the obvious, but before anyone understood how or why plants worked, they were still used and used effectively, although occasionally a patient may have been harmed. Inevitably, local knowledge of regional plants was shared and circulated even before anything was written down, so early healers did not have to keep reinventing the wheel. Knowledge of human anatomy and systems, as well as body chemistry and genetics, has advanced remarkably—and continues to—but this does not necessarily mean that primitive plant medicine was ineffective. For instance, willow water, made by soaking twigs or bark in water, has long been used everywhere willow trees grow as an anti-inflammatory. Modern science later identified the presence of the glycoside salicin in the willow

plants, which became the basis of the little white aspirin pill. Those who initially discovered this use didn't know the precise scientific reason, nor did they need to.

Accessing the useful parts of a plant has also been an area for exploration historically. Mint settles an upset stomach best when dried leaves have been infused in hot water to make a tea. Eating purple coneflower to access the plant's antibiotic or immune-system-boosting benefits isn't very effective; but powdering the dried roots or, better yet, making a tincture is. Tinctures, infused oils, salves, and poultices are additional ways we extract or maximize a plant's healing properties.

An overview of herbal medicine produced by the University of Maryland Medical Center makes another interesting point. "Researchers found that people in different parts of the world tended to use the same or similar plants for the same purposes." Hence the widespread use of willow water, as mentioned before. This would seem to support claims made about the efficacy of many common plants used to treat sick or injured patients.

How is such synchronicity possible? If you ask, the healers in communities far from one another often reply that they *sensed* the proper use, as though it were a matter of intuition or instinct. Some even say that the plant *told* them. Interestingly, this explanation is also often given for how humans have discerned which plants are good or safe to eat. Before we dismiss such explanations, bear in mind that healers past and present study nature carefully in ways that most of us do not.

Since illness and disease have not been eradicated in our modern world, the research continues. In fact, there is a growing sense of urgency because the natural world is so severely threatened by habitat destruction, climate change, and species loss. For all we know, there may be a singular rainforest plant, or a tundra plant, that holds the key to treating all cancers. In the past, medicines derived from the plants of the garden, fields, and forests were not only considered legitimate, but were the primary option. In fact, this is still true in many places

in the world, particularly rural Africa and India. The World Health Organization estimates that 80 percent of people worldwide rely on herbal medicines for some part of their primary health care.

There's no denying that over time mainstream Americans began to trust whatever was in the little orange plastic medicine bottle with the printed label more than whatever was growing just outside the door. Significant and innovative medical and pharmaceutical advances have been lifesavers. Yet, in a bid to find effective and/or more affordable alternatives, or perhaps as a backlash, some people have turned (or returned) to herbal medicine and homeopathy.

Claims that "natural medicines" are in general safer or have fewer side effects are not conclusive, however. For example, clinical studies have found that the herbal remedy St. John's Wort interferes with the effectiveness of many drugs, including the blood thinner warfarin (Coumadin), protease inhibitors for HIV, birth control pills, certain asthma drugs, antidepressant pills, and many other medications. On the other hand, numerous laboratory studies confirm that *Ginkgo biloba* improves blood circulation by dilating blood vessels and reducing the stickiness of blood platelets, though it too interferes with Coumadin. In other words, it's hard to generalize.

It is also important to note that the FDA regulates the medications commonly prescribed and purchased in the United States. It's not true that herbs and supplements are totally unregulated. For them, the FDA enforces GMP, or Good Manufacturing Procedures. Some people feel this is insufficient, and quality and claims vary—bad or ineffective products can give the whole field a bad name. Americans interested in exploring herbal medicine are well advised to proceed with caution. Your best bet would be to consult with a qualified experienced herbalist or naturopath.

Plants have consistently proven to be resources important to our survival. Even when we don't quite understand why or how, there is no reason to think we've reached the limit of their potential. The fact is, a great many plant medicines and remedies do work and certainly have stood the test of time. Pharmaceutical

companies know this, and part of their research and development continues to probe folk and indigenous knowledge.

A recent trip to a local historic museum reminded me of the journey plant medicines have taken in this country. I was at the Farmer's Museum in Cooperstown, New York. While my husband browsed the many old-fashioned and ingenious farm tools in the huge barn building, I visited a small apothecary hut where a man in period costume was holding forth on colonial-era medicine for the tourists. Presiding over a weathered wooden counter, he deftly rolled up small dried ginger pills while he talked about the sorts of medicines people used over 200 years ago in this part of the world. Ginger's ability to ease digestion and alleviate nausea is well established, and the small group did not look skeptical. Some even accepted his offer to sample one.

I looked around the space, observing jars of dried plants and seeds, mortars and pestles, sieves, and antique bottles and vials. Bundles of herbs hung from the low rafters. There was a shelf of old reference books. In short, it looked to be a thoughtful and authentic reproduction. I was puzzled by something, but I waited until everyone else filed out.

Then we struck up a conversation, and, once he discerned my knowledge of plants and herbs, he dropped out of character. After I complimented him on his ginger-pill presentation, I asked my question: "Ginger is an Old World plant. Didn't the early Americans use native plants for medicine?"

He explained that—as with their food—the first settlers tended to prefer plants they already knew, bringing familiar remedies across the sea from Europe to the new land. This would have included plants such as plantain (the crushed leaves ease the pain or itching of insect bites and rashes), feverfew (leaves infused in tea or eaten in small amounts treated the pain of arthritis and migraine headaches), and mints (for digestive issues). You are likely to see these non-native plants included in the restored gardens of colonial-era interpretive museums from Strawberry Banke in Portsmouth, New Hampshire, to Plimoth Plantation and Sturbridge Village in Massachusetts, to Colonial Williamsburg in Virginia, and they were growing outside the door of the Cooperstown apothecary as well. The

efficacy of those Old World plants was established centuries ago and still holds today.

If early white settlers couldn't grow their favorites—and ginger is a tropical plant that our Northeast winters would promptly kill—they'd simply import them. In the book *Jane Colden: America's First Woman Botanist*, the biographer describes the arrival of Jane's father to Philadelphia in 1710. He'd been trained in medicine in Edinburgh, Scotland: "Like other Europeans coming to America, Colden was amazed at how different the New World's flora and fauna was.... He soon became interested in learning about American plants and especially their medicinal applications.... But the need to earn a living prevented him from pursuing his interests right away." He turned to importing medicines.

So, can we gather that although the rich native flora did not go unnoticed by white Europeans, it went unexplored or underutilized? For how long? The Cooperstown apothecary docent showed me a worn, fragile volume entitled *The Dispensatory of the United States of America* (1883), essentially an early herbal, a descriptive catalog of plants and their uses. Garlic, stinging nettle, St. John's wort, mint, chamomile, plantain, cloves, arnica. No surprises here and, at a glance, no especially odd or illegitimate uses, even by modern standards.

But I thumbed through the old book again: no Native American plants; no jewelweed, no witch hazel, no yaupon holly, no evening primrose. Why not? Were the settlers hesitant to use native plants medicinally? Didn't they ask or go to native healers? Or did they feel their own remedies were sufficient?

His opinion was that they were fearful. The American wilderness contained lots of unfamiliar plants. The native people and animals were not always friendly. "It took time to get curious, and comfortable," he opined. In time, the white people did wade in and begin to forage for or grow useful native plants. A book published in 1892, titled *The Cottage Physician: Best Known Methods of Treatment of all Diseases, Accidents and Emergencies at Home*, was by "an intrepid British botanist" who traveled widely throughout the Northeast, gathering and compiling information. By then, the Native American tribes of the Northeast were greatly

diminished. When war and territorial conflicts were not the issue, disease was—smallpox, a white man's disease that killed thousands and for which there was no native plant medicine.

In Jane Colden's story, I find another possible reason why native plants didn't make it to the early American apothecary shelves quickly. With her father's encouragement and mentoring, and later correspondence with prominent botanists of the day (John Bartram, Peter Collinson), she produced a fairly extensive American herbal during the years 1753 to 1758. In a book called *Science in the British Colonies in America*, Raymond Phineas Stearns remarked that "[Colden's] plant descriptions were often good, and she displayed a housewifely concern for the uses of plants in cookery and as household remedies for sickness."

Jane evidently consulted other colonial women in her area for that information. Where those women gained the knowledge is an area for speculation. It's also entirely possible they gleaned some information from Native American healers in the region; sometimes such healers were women.

Bear in mind that in the early days of the American colonies, there were myriad cultural exchanges and trade between the white settlers and native people. In a booklet produced by the Smithsonian to accompany a 1980 traveling exhibit *Medicinal Plants in American Indian Life*, ethnobotanist Barrie Kavasch hastens to point out that: "Herbal traditions of every American Indian cultural group on this continent reach far back into prehistory…. [They] had an exceptional understanding of laxative, diuretic, emetic, birth control, and fever-reducing drugs derived from native plants."

Still, a century, or more, was a long time to resist using or mainstreaming native medicinals. Fear of the unknown and other factors could have conspired to keep newcomers from fully discovering and using the extensive body of knowledge that those native to this land had accumulated. Setting aside the social and political issues of the day, we can rue that valuable information was probably lost.

The belief that modern and packaged (and often expensive) medication and

treatment is "good," and old-fashioned and homegrown are "bad" or at least risky, bears examination.

Consider this: a Boston friend of mine suffering from ovarian cancer kept the disease's advance at bay for two years with an experimental gene-therapy medication so cutting edge that it is not yet approved by the FDA. Meanwhile, a cancer patient in the Amazon River Basin might be treated by a native healer using the culture's own plant-based medications. It's not easy to say which treatment is superior or which cancer patient is more fortunate because there are so many variables in the treatment of any disease or any specific patient. But we should keep an open mind.

Pharmaceutical firms prefer synthetics or semisynthetics to plants and their derivatives. A sobering study of modern pharmaceuticals done at Purdue University in the early 1990s noted, "25 percent of modern prescription drugs contain at least one compound now or once derived or patterned after compounds derived from higher plants."

What accounts for this low number? It is not merely that old-time herbal medicine has been outpaced or discredited. Part of the answer is that the drug companies want proprietary products. That's where the market share is and, yes, the profit. They may also defend these proportions by saying it is better to manufacture the compounds than strip a forest or field of the useful plants. I'd wager that they find the synthetics cheaper and easier to produce. If a plant offering breakthrough medical benefits could be brought into cultivation one way or another, to create sufficient supply and to deliver consistent uniform harvests—in a profitable and efficient approach—they'd be on it.

There's another practical reason, too. It is often difficult to identify and isolate the part of a plant that provides the sought-after or reputed benefit. To make a medicine, modern lab scientists aim to get at that single active compound. "Trying to find the part of a plant that has a specific effect can be like disassembling a radio to search for the one part that makes the sound," lamented a *National Geographic*

article published in 2000 entitled "Nature's Rx." Even the native healer who uses a plant and gets the desired effects may not really know, or know at the level the pharmaceutical researcher wants to know.

Perhaps the active ingredient cannot be isolated easily or work in concert with other compounds also present in a given plant. Consider that there is a synergy that cannot be measured or captured by scientific methods. Each human patient presents a unique body chemistry; each specimen of a plant also presents a unique chemistry. Native healers and traditional herbalists cope with and evaluate based on a gestalt of variables. Isolating an active compound may be neither safe nor desirable. The challenge is that nature is inherently variable. Effects and effectiveness can vary from one specimen of a plant to another, or from one season to another, or from one region to another. Even the properties of one plant may vary.

The fact remains, a wealth of knowledge and potential are still available in nature—this is not hypothetical. There has to be some economic incentive for drug firms to investigate natural alternatives—widespread established ones as well as ones yet to be discovered. If there is a way to patent plants or their compounds and still ensure profits, pharmaceutical companies will find it. My point is that the major drug companies keep an open mind, though not always or exclusively for altruistic reasons.

Virgin American wilderness has long since gone under the plow or been paved over. Pockets of indigenous landscapes and the cultures that inhabit them in remote areas are today's equivalent. Their healers may know things about their plants that can help us all.

The Central and South American jungles, the scrub and desert habitats of Africa and Australia, isolated islands such as Madagascar, and alpine plants worldwide—these are among the present-day areas of interest. Habitat destruction is only part of this race against time. The other peril is equally urgent, the threat of fading and lost knowledge. In the introduction to Mark Plotkin's *Tales of a Shaman's Apprentice: An Ethnobotanist Searches for New*

Medicines in the Amazon Rain Forest, Richard Evans Schultes ticks off the many factors. "Civilization is on the march in many, if not most, primitive regions," he writes. "The rapid divorcement of primitive peoples from dependence upon their immediate environment for the necessities and amenities of life has been set in motion, and nothing will check it now. One of the first aspects of primitive culture to fall before the onslaught of civilization is knowledge and use of plants for medicine. The rapidity of this disintegration is frightening…" Plotkin's book came out in 1993. Schultes' warning is old news.

Back in the September 1988 issue of *Sanctuary* magazine, in the article "Don Eligio's Pharmacy," Rosita Arvigo shared her own challenges in approaching a knowledgeable Mayan shaman in rural Belize. Although she was patient and respectful, although she had demonstrated credentials in botany and herbal medicine, and although she was permitted to help him on his farm and on harvesting expeditions, the elderly healer "evaded the main issue, insisting it was no good to teach a *gringa*." She persisted because she believed his knowledge—part of a long tradition of healers—was precious and important. She was able to get the backing of the New York Botanical Garden and, eventually, to use what she learned and tried to learn in a National Cancer Institute program "to scour the tropical rain forests in search of medicinal plants to be tested against cancer, AIDS, and other diseases."

But you can see the scope of the challenge: the interested foreigner, Arvigo, was just one person, working with one elderly native healer, in a small geographic area. As Plotkin perceptively said, "Every time one of these medicine men dies before someone can capture his knowledge, it is as though an entire library has burned down." Indigenous knowledge frequently is transmitted orally, person to person, mentor to student, while the Western world seeks written recorded data and information.

A case in point is soursop, or graviola, *Annona muricata*. A relative of the paw paw, it's a broadleaf evergreen tree that grows in South and Central America and many Caribbean islands as well as parts of tropical Africa and Asia. Its fruit is long,

green, and prickly; inside there's edible white pulp and black seeds. With a hint of sour citrus, the fruit is popular in drinks and desserts. Traditionally, soursop has been used as a way to fight infection and chronic disease. As a cancer treatment, it is said to target only malignant cells, though claims of it being "10,000 times more effective than chemotherapy" seem beyond belief.

Memorial Sloan-Kettering's Cancer Center relegates it to a "purported" treatment, while Cancer Research UK states that "in laboratory studies, graviola extracts can kill some types of liver and breast cancer cells that are resistant to particular chemotherapy drugs. But there haven't been any large-scale studies in humans…so we do not support the use of graviola to treat cancer."

Efforts to gather information leading to the creation of a profitable medication brought on another problem, an ethical one: the issue of intellectual property. Are medical researchers and big pharmaceutical companies getting away with helping themselves to and profiting from indigenous knowledge and plants? The answer seems to be "not so much" in recent times. In 2007, scientists sat down with local healers in Kenya to try to hammer out an agreement.

The policy, which will eventually become law, lays out a strategy to conserve traditional plants, which often are overharvested in the wild, establish the safety and efficacy of traditional remedies, and commercialize remedies on the world market. It also addresses intellectual property, primarily to ensure that traditional healers are compensated for drugs that are eventually sold. Specifically, the agreement states that before scientists can start work, documents must be signed so profits are shared if drugs are developed.

"The existing IP [intellectual property] rights mechanism doesn't contain enough provisions to protect traditional medicine," said Jack Kaguo Githae, a traditional healer from Central Kenya who has contributed to the consultation. "We need to develop an African solution. Benefit sharing is very important. It is a communal resource, and I think it should be approached like that."

Through this agreement, implemented in 2013, the precedents are set. Other

examples cited in a report by the World Intellectual Property Organization (WIPO) include a recent agreement between traditional healers in Samoa for a share of the benefit from an AIDS drug that drew upon their knowledge of the mamala tree. The Kani tribe of South India now shares in the benefits of a new sports drug that is based on their knowledge of the medicinal plant arogyapacha. And so on.

Let's hope any and all plant-based remedies will be made available to those who can benefit from them. Therein lies the advantage of outsiders coming in to gather material and information for scientific research and potentially wider distribution.