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Holism and Reductionism

Musings on Barberry and Descartes

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I. The Woods

Berberis thunbergii is a good place to start. This understory shrub, usually referred to as Japanese barberry, is common in the northeastern U.S. It is characterized by bright red berries that dangle in clusters from its branches in the fall and throughout the winter, and by numerous thorns that would make it an attractive candidate for a hedgerow plant. This was most likely the reason for its initial import from Asia; the problem is that barberry does not stay put. It spreads voraciously over the landscape, and I have met botanists who scorn it as an "invasive alien" - a blight upon the land - as it spreads in thickets over sometimes huge swaths of land, in open meadows, along roadsides, and under hardwood groves.

Barberry, however, is a valuable plant. First of all, it is what is often referred to as a "warrior plant". Along with other thorny plants such as Rubus spp. (brambles), and Rosa multiflora, it moves in rapidly onto disturbed land [replacing the very first pioneers such as Verbascum thapsus (mullein) and Arctium lappa (burdock)], to create impenetrable barriers. In this way it can be seen as analogous to a component of the human immune system, or alternately, as scar tissue, keeping out large animals - most notably humans - from a piece of land struggling to recover through the slow process of soil accumulation and remineralization.

On a more practical level, Berberis is also a valuable medicine.[1] Similar to its cousin in the western U.S., Berberis aquafolium (Oregon Grape), barberry is an alterative, cholagogue, and bitter tonic, helping to cleanse the liver and blood, and to stimulate gastric and intestinal enzymes, thus increasing and improving digestion. It is especially useful in cases in which the body's impaired ability to detoxify manifests itself in the skin (the body's detoxifier of last resort). In addition, it has strong anti-bacterial, anti-fungal, and anti-viral properties, useful in preventing and treating myriad infections both topically and internally, from the throat down through the intestinal tract. Traditionally it is the root bark, harvested in the early Spring or late fall, that is used, although the twigs are also medicinally active.

Barberry is high in berberine (naturally occuring chemicals are often named for the organism in which they are first identified), an alkaloid that imparts to its inner bark a bright golden yellow, which is also found in a native and now scarce eastern woodland herb, Hydrastis canadensis, or goldenseal. It is a risky business to judge plants' medicinal activities by the activity of particular chemicals found in them; the whole concept of the "active ingredient", followed by herbal products standardized to these

[1] Berberis vulgaris is most often cited as the medicinal species, but is not very common in our region, and the two species can be used interchangeably.

chemicals, has created more misunderstandings than it has good medicine. But in this case, barberry and goldenseal do share many properties, as people familiar with the uses of goldenseal will see by the above indications.

Thus, we could take pressure off the demand for goldenseal, which should only be cultivated and not harvested from the wild due to its scarcity, by substituting barberry whenever appropriate. Doing this, we could at the same time clear the woods of this non-native plant and create income for local wildcrafters. (Another herb, Coptis trifolia, or goldthread, is also high in berberine, and even more similar in activity to goldenseal. It is common in many parts of the North woods, and a hundred years ago was commercially available, but its roots are so thin that it could quickly become endangered if commercial harvesting resumed.) There are no doubt plants occupying similar niches in other bioregions – so called "invasive weeds" that are in fact quite useful. The same can certainly be said of Pueraria lobata (kudzu) in the southeastern U.S., useful in treating disorders as diverse as inflammation of the gastrointestinal tract, muscle spasm and pain, and heart disease.

Does it make sense then to view such plants as "invasive aliens" in the landscape? On the one hand, Berberis does spread readily into the understory below mature hardwoods, crowding out native plants of the herbaceous and shrub layers of the forest (unlike Rosa and Rubus, which tend to thin out as succession converts a field into mature forest). But on the other hand, we know that such woods are in reality far from healthy climax forests. Would Berberis be anything more than a marginalized weed limited to roadsides and the like, if what it was encountering here was Eastern old growth rather than the sick land that it is, barely beginning to recover from 400 years of repeated clear cutting and abuse?

II. The Philosopher and the Meaning of Health

The ecological concept of invasive species parallels closely the pathogenic, or microbe model of disease. Such a view leads to the justification of drastic measures, and we can see the ecological equivalent of toxic chemotherapy in the use of chemicals to suppress "invasive species" of plants.[2] PSE&G, the local utility company in Southern New Jersey, has been engaging for the last few years in the most massive aerial herbicide spraying in the history of the state, sanctioned by the Department of Environmental Protection, to rid the wetlands of Phragmites, all in the name of "ecological restoration". At the same time, agencies in the New York City area have reacted to the West Nile Virus by enacting widespread aerial and ground spraying of toxic chemicals, despite the fact that more people are being sickened by the pesticides than by the disease, all in the name of "public health".

This is a reflection of the focus of modern medicine on illness, rather than on health. This approach has created real life medical miracles for those individuals suffering from acute and late stage illnesses that require high tech drastic measures. Who doesn't marvel at the surgeon's ability to successfully remove his patient's heart from her body

[2] Even the Sierra Club has come out in the past in favor of the use of herbicides in certain situations to kill invasive plants.

and place it on a dish, operate on it to remove widespread tumors, then rebuild it and replace it successfully in her chest cavity? But we pay a heavy price for this set of priorities, reflected in public health statistics that make the U.S. resemble the poor countries of the world more than our economic counterparts. We can see how the same mentality makes our nation very efficient at waging war, but very deficient at promoting peace.

Indeed, the very concept of health is altogether lacking in conventional medicine. Even when we speak of "preventative medicine" – such as the suggestion by the National Cancer Institute to eat more brassicas because they have been shown to aid in the prevention of cancer – we are still focused on disease, not health. Taber's Cyclopedic Medical Dictionary states that "the World Health Organization defines health as a state of complete physical, mental, or social well-being and not merely the absence of disease or infirmity."[3] This is not a bad definition, despite its limitations such as the omission of spiritual well-being and the importance of family and community, not to mention the greater Society, all of which are subjects too broad to delve into for this article.[4]

However, the entry goes on to dismiss even this small attempt at an inclusive definition of health, by stating that "this definition is of limited usefulness when evaluating an individual." Any holistic health practitioner knows how far this is from the truth! As its primary definition, Taber's describes health as "a condition in which all functions of the body and mind are normally active". This seems innocuous enough, but in fact reveals the deep mechanistic underpinning to current medical thinking. This mechanistic view of the human body can be traced back to Rene Descartes, the French philosopher of the 17th century, who was its earliest and perhaps greatest champion.

Descartes believed that the Universe was essentially a vast machine created by God (more than a metaphor, he believed this to be literally true). Indeed, every component of the Universe was mechanical in nature, however complicated, with only two exceptions: God, and the human soul. It is easy for a holistic minded person to see how dangerous such a world view can be. From the soul sprouts free will, and in turn, thought. This is

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[3] **Taber's Cyclopedic Medical Dictionary**, 17th Edition, F.A. Davis & Co., Philadelphia, 1993

[4] These are of course complex and far-reaching topics. Here's something to think about from *Scientific American*, July 2000 ("The Geography of Death", p.22), explaining research by Ichiro Kawachi on regional variations in mortality rates. He shows that mortality corresponds not only to socioeconomic status, but even *moreso* to *economic inequality*:

"A better explanation [for regional variations in mortality rates] may lie in distribution of income. States with significant income inequality also tend to have high mortality rates, a relation that holds for both blacks and whites. Unequal income distribution may shorten lives because it degrades civic cohesion. Ichiro Kawachi and his colleagues at the Harvard University School of Public Health measured civic cohesion in terms of participation in community groups and by the extent to which people trust one another, as measured by such statements as 'Most people would try to take advantage of you if they got the chance.' They found that in states with high mortality, such as those of the Southeast, trust in others is low and that in states with low mortality, such as Minnesota, North Dakota, and Utah, trust is high.

"As for public policy, Kawachi believes that reducing income inequality would help lower mortality; he suggests prescriptions that might include raising the minimum wage, expanding the earned income tax credit and increasing child care subsidies. Others…hold that the best approach is to rely on public health measures."

the true meaning of his famous *Cogito ergo sum* (I think therefore I am): that we humans, as the only beings beside God who think, are the only beings who can be said to truly exist.

Despite being referred to as one of the first great rational thinkers, such a mentality can only be explained by an entirely irrational allegiance to the Judeo-Christian myth of Man being created "in the image of God".[5] In this universe, Man and God stand on one side of the great divide, and the rest of Creation on the other. Descartes believed this to such an extreme that he described animals as *automata*, since "it is more reasonable to make earthworms, flies, caterpillars, and the rest of the animals, move as machines do, than to endow them with immortal souls."[6] A man true to his words, he was known to perform vivisection (live dissection) on dogs and other animals, since they were after all, soulless and thoughtless, and therefore did not even *exist* to the degree that he did.

I dwell on Descartes' thinking only because I consider his influence to have been so profound on the culture we find ourselves in. His model of the universe still dominates mainstream culture, even if modern physics has since left him behind, and it is not difficult to see how dangerous a philosophy it is. After all, it is not so much Science or rational thinking in general, but rather the rationality of the Scientific Method coupled with the irrational arrogance of human superiority, that have led us down the destructive path we find ourselves on.

Descartes' philosophy also unfortunately still dominates the modern medical approach. There is in fact little difference between his view of health, in which he "compares a sick man and a badly constructed clock with…a healthy man and a well made clock"[7], and the modern definition of health as "a condition in which all functions of the body and mind are normally active". This mechanistic view of the human body, consistent with the Cartesian view of the world at large, is a perfect example of reductionistic thinking. At the risk of over-simplifying, we can boil down the term *reductionism* to mean that *"understanding each part leads to understanding of the whole",* whereas *holism*[8] can be defined as *"the whole being greater (or at least other) than the sum of its parts"*.

At the same time, completely rejecting the pathogen model would be going too far. For example, I have yet to hear a good alternative explanation for the rapid spread of smallpox among Native American populations. Smallpox spread so rapidly and so virulently that it wiped out whole villages before their inhabitants had even heard the news that a strange white people had arrived from across the ocean, at a time when (it can be said without any risk of romanticizing) Native Americans were vastly more healthy than the Europeans of the time, who having become resistant also suffered from it but to

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[5] I'm purposefully using the term *Man* here rather than a gender neutral word, since I think that it more accurately reflects the thinking and mentality of these cultural beliefs.

[6] Descartes, "Letter to Henry More, 1649", from **Descartes Selections**, ed. Ralph Eaton, Charles Scribner's Sons, 1927

[7] Descartes, **Meditations on the First Philosophy in Which the Existence of God and the Distinction Between Mind and Body are Demonstrated**, Meditation VI: 'Of the existence of Material Things, and of the real distinction between the soul and body of Man', ibid.

[8] The words *health*, *holy*, and *whole* all derive from the same Old English word *hal*.

a far less degree. It is very similar to the story of the infamous blight that all but wiped out our native chestnut, Castanea dentata. Another example is the influenza pandemic of the early twentieth century, in which, counter-intuitively, the young and strong succumbed to the virus more than the old, sick, or otherwise immuno-compromised. There are other examples. Perhaps Berberis thunbergii would invade old growth as well. We may never know the answer to that question.

What is clear is that the pathogenic model is the exception rather than the rule; a healthy organism will rarely succumb to disease.[9] The *terrain* is far more important than the *microbe*. How else can we explain the fact that people who have *more* social interactions with friends, family, and community, are *least* likely to catch a cold during cold and flu season?[10] I have no doubt that we could save far more lives from West Nile virus (which incidentally has been responsible for the deaths of eight people over two years, whereas the flu kills several thousand annually) by promoting strong immune function through diet, exercise, and the use of immune tonifying plants, than we could save by poisoning ourselves and the land, along with the mosquitoes, with pesticides.

III. The Garden

At Frost Hollow Farm, a medicinal market garden in northeastern Pennsylvania, the strength of the holistic approach in building *healthy land* has become more clear to me over the last few years as the garden has matured into an active ecosystem.

The most striking example lies in the potato patch. Compared to the wild, semi-wild, and otherwise tough medicinal herbs making up the majority of the garden, potatoes represent needy domesticated annuals – just where you would expect to see more pest problems. But in fact in all of 1999 I saw only a handful of Colorado potato beetles, the worst pest on potatoes in our area, and this past year I saw none at all. Only ladybugs showed themselves as I peered under leaves looking for eggs, and eventually I quit looking. I think there must be others in the area having the same success, but I have yet to find them.

Returning to the ideas discussed earlier and applying them to the land, a "preventative" approach to Colorado potato beetles would be to introduce ladybugs, or use other means to actively deter them. There's nothing wrong with that; in fact sometimes it is the wisest thing to do, but that in itself will not build land health. For that you must forget entirely about the pests (i.e. microbes), and focus on nurturing the land back to wholeness. At Frost Hollow this involved the tried and true methods: copious amounts of compost, minimization of tillage, and maximization of self seeding annuals and perennial crops.

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[9] "The failure of allopathy was that it treated disease, or a part of an organ, or tried to do so, whereas the only means of cure was to treat the whole patient." Fergie Woods, as quoted in Yasgur's Homeopathic Dictionary, by Jay Yasgur, Van Hoy Publishers, 1998, p.9

[10] Journal of the American Medical Association, June, 1997

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Biodiversity is of supreme importance, and there is always something flowering in the garden during the growing season, often members of various different families at the same time. These include Apiaceae (formerly Umbelliferae), such as Levisticum officinale (lovage) and Foeniculum vulgare (fennel), Lamiaceae such as Ocimum sanctum (holy basil) and Melissa officinalis (lemon balm), and Asteraceae (formerly Compositae) such as Echinacea purpurea and Inula helenium (elecampane). At any time between April and October, the garden is buzzing with an amazing assortment of insects for such a small space (the garden spreads over less than an acre of land).

In the first two seasons weeding was more intensive, while certain species such as Viola sororia (dooryard violet), Plantago major (broad leaved plantain), and Taraxacum officinale (dandelion), were encouraged to prosper. Now they serve as living mulch over much of the garden, cutting down drastically on the need for weeding or mulching, and providing habitat for myriad insects. I liken all this in my mind to encouraging a healthy diverse bowel flora, which once established prevents the overgrowth of pathogenic organisms in the gastrointestinal tract. And now that they grow in sufficient quantities, they are also harvested as a money making crop. The plantain and dandelion reach sizes many times over what they achieve in adjacent lawns and nearby waste places, which I believe might be due to giving them space to grow as much as the soil fertility (although I have not tested that). In other beds I have experimented with using Trifolium repens (white clover) as a living mulch around perennial herbs, which has worked well enough for me to plan to expand it.

In four years the garden has come to resemble a wild meadow, and in all that time only one pathogen has invaded with enough vigor to require some reductionist thinking. That was a rapidly growing colony of voles that seemed to enjoy nesting in the thick straw mulch and munching on seedlings of lettuce and echinacea. But that infection was resolved with the use of a fairly benign medicine: a cat, which quickly sent them packing to the neighbor's yard!

Over the past few years the garden and the woods have begun to teach me about the connections between land health and human health. Maybe these are obvious teachings. Indeed, it is only that Cartesian culture in which I was raised that led me to separate the two in the first place. For myself, the path toward health, or wholeness, involves breaking free of that mentality in the search for balance: intelligence yes, but coupled with wisdom, knowledge with humility (and recognition of our fundamental ignorance), and science with mystery.

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