

## Ode to Optical Surveying for Permaculture



by Tom Ward, Little Wolf Gulch, Easter 2010  
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### ODE TO OPTICAL SURVEYING

A romp in the vocabulary of observation.

By Hazel (aka Tom Ward), Little Wolf Gulch, Fall Equinox 2018

Natural eyes are multi-talented, even in Humans. We can learn to improve our eye-sight, so that we make accurate and useful observations. Modern life promotes a narrow use of the eyes called tunnel vision. To break out of robotic focus-forward, we can learn some exercises: palming, sunning, swinging, focus-jump, flashing, peripheral-stretch and tension release; all these lead to more comfortable and trustworthy seeing.

The flows of sunlight, wind, water, frost and heat all can be observed and mapped. This allows perfect timing, as we *see* the implications and know what to put where, when. Which way is a cloud moving? How does air move over the trees and hills? Careful relaxed time spent sitting and watching will teach us wide seeing. Surveying practice teaches flexible focus. Memory and note maps will help us see patterns.

The movement of a cloud is seen by focusing on it, beyond a closer focus point, such as a twig, and watching for directional flow. Some local clouds are swirling or expanding, and the overall movement of a weather system is not the direction the local wind and clouds are moving. There are often two decks of clouds moving in different directions, and the whole system is drifting in a third. Following the cosmic movements of moon/earth-shadow/sun-orbit/galaxy-swirl, during an eclipse, is even wider focus. All about spirals.

For slow, subtle, air flows, small paper and cloth flags (tattle-tails) can be usefully located. Max-min thermometers, and shadow stakes (sundials), as well as barometers, and rain gauges, give us numbers to note in journals, and later place on maps. The seasonal changes of pollinator sightings, plants-in-flower, butterfly and insect cycles, wildlife signs and cycles, all suggest patterns, to follow for the best timing of interventions, and disturbance regimes, for biodiversity magnification.

The other skills that need practice besides using sight, with the other senses, are the consistently accurate use of tools for measurement, *and* the math, notation and mapping skills, requisite to good assessment and layout. After being introduced to bodily approximations, one learns to measure distance with tapes, so that tension-pull, and double-checking, and eye/scope fit, and mark-by-pencil, all trend to consistency and accuracy. Then, one learns to use a compass, consider declinations and local magnetic deflections, and have the patience and steadiness, to point to the proper azimuth.

The pocket-transit combines a clinometer, with a compass. The clinometer will show us vertical angles, using a gravity arrow, and then the compass gives us horizontal angles, with a magnetic arrow. To get level, we use bubbles that ride glass curves, weights on strings, calipers the size of humans, and water in transparent pipes. By the time we are behind the tripod and builders transit, and peer through the 10 X scope, at the magnified rod numbers, we are working in crews, and all are focused on the numbers, and yet it is the assessment by experience, that lends the first confirmation of ready-to-move-on. Twice checked, tabulated with notes.

After practice with the tools, and with the actual experience of implementation and construction, from assessment through mapping, and from drawing to supervision, we learn to estimate. Guess work is an important aid to quick fixes, retrofits, and ultimate permaculture. This is where elders can help, by sitting there and asking questions, then delivering estimates.

Using our bodies as instruments, with pacing, hand spans, and arm lengths, we can learn to approximate height and distance, and then check with optical devices and tapes, to see how consistent we become. Along the line we also learn *tolerance*: the parameters of the job, and the accuracy of the construction tools, tolerate different precisions. It all depends. If we are staking for a bulldozer, the job can tolerate plus or minus one tenth of a foot in accuracy, as the ground is rough and the blade is crude. If we are making doll furniture our pencil is sharp, the ruler finely etched, the saw fine-toothed. Earthworks allow loose tolerance, space flights demand tight.

Water is the medium jealously measured in times of drought. Arriving from wells, springs, or reservoirs, to be drank or flushed, or deployed in irrigation, or drained and leaving with nutrient loads, water travels in pipes, ditches, and troughs, that have pitch, and volume, and friction-drag. Water wants to escape, and to cut, and fill, to move stuff. Finding leaks or blockages, and laying out continuous gradients, and matching source-flow rates, to pump, to pipe, to tank, to spillway, is done by numbers, found by Humans using surveying devices.

Engineering a swale, to absorb runoff, or a pond, to hold irrigation potential, is four dimensional conception and implementation. Time is the fourth dimension. Volume measurement is advanced math. We usually only estimate, unless we can empty or fill through flow gauges. Many other observations go into managing a pond, and the stacking of information overlays, leads to multi-dimensional imaging, that focuses the investment plan.

Biodiversity is often high in traditional or indigenous Human managed food-forests and hunting ranges. The observations of the tenders, over long time-lines, are finely nuanced in Traditional

Ecological Knowledge (TEK) story telling. Thus post-industrial Social Forestry begs a wise language of naming and measuring.

Eco-surveys, both as initial grid sampling, and as fixed-plot or transect-line-over-time protocols, keep records of changes and inventory. Respect for the natural cycles (kept on calendars as maps) allows restoration work to be well timed. Under-story thinning, for old-growth over-story maintenance, uses flagging, and stakes, and paint blazes, to guide the work crews, and to protect keystone ecological elements. Rare-plant surveys are done by experienced botanists, who can see out of the corners of their eyes. Epic poetry repeatedly presents TEK phraseologies (word-maps) to describe and remember threads-of-meaning through symbolic metaphors.

Then, and now, and always, there is the metaphysical. That we dare or deign to measure the etheric is hubris. However, some tools help to trigger intuition, and pattern recognition. We should not ascribe causality to planetary movements (only relative as far as we can see from earth, of course), but iconic symbol sets, and patterns seen in Tarot cards, or Astrology wheels, can be repurposed as mapping templates, as we learn to think about systems.

In alternative medicine, many indirect tools (Iridology, muscle testing, pendulums, pulse clusters, galvanic meters), have been used for assessment of complex patterns of health, that better nutrition or treatment might improve. If one learns to use a set of sampling tools consistently, one often notices emergent patterns of complexity, in the corner of one's consciousness. We have found that several indirect indicator tools, used in conjunction, sometimes reveal patterns that one or two tools cannot reliably show.

Of course the metaphysical practitioner is warned, that their own subconscious conceits are lurking. The Heisenberg uncertainty principle says that one can measure two of three characteristics (speed, direction and mass) of a particle, but not the third, without changing one of the other two. Thus the observer is always part of the findings. When we observe Nature, or what we think is *Other*, we learn more about ourselves, than we do about others. When we lose

attachment to the observer/observed boundary we reach enlightenment, so the sages tell us. I found it in a book with my eyes. And confirmed detachment, through meditation and Nature immersion, allows All Sentient Beings their own perfection. Who noticed?