

## **A Relationship of Reciprocity: Heaven, Human, and Earth**

After a few hundred years of technologic and scientific advancements that have allowed for unprecedented growth and exploration, research has led scientists back to a conclusion that ancient cultures have known all along: all of life is deeply tethered to a reciprocal relationship with the earth. As *The Yellow Emperor's Classic: Plain Questions* says, "The changes of Yin and Yang in the four seasons are the roots of all things." What sets Chinese Materia Medica (CMM) apart to address the current state of worldwide health are not just needles and herbs, but a time-tested system of *zheng* diagnosis, or pattern differentiation. This system requires a skilled Chinese herbal medicine practitioner to individualize herbal formulas for each person, at each stage of pathology. Furthermore, the historical use of CMM has employed best practices for planting, harvesting, processing, and administering herbal formulas, honed over thousands of years. To miss any step of this careful process could compromise the efficacy of CMM. To ensure CMM will have a successful and sustainable future, CMM practitioners are in a pivotal position to advocate to the other major players in the CMM and modern medicine industries with three innovations, 1.) Use modern standardized herb quality tests 2.) Source herbs from sustainable and innovative growing techniques, and 3.) Participate with and inform the conducting of scientific trials on herbal formulas to allow better communication between modern medicine (MM) and Oriental medicine (OM).

Thousands of years ago, the authors of *The Divine Farmer's Materia Medica*, included where to find each herb in the wild, as this ensured the proper *dao di*. In modern terms, *dao di* roughly equates to having the proper balance of medicinal compounds, as well as being grown in the proper geographic origin. Herbalists would further verify the potency of an herb "organoleptically," or through their attuned senses of smelling, looking, and tasting for the vital qi (Schafer, 2011). In an effort to standardize herb quality today, using technology, the Hong Kong Chinese Materia Medica Standards (HKCMMS) has published chemical standards on 299 herbs, and counting. These standards establish a benchmark for how to identify authenticity, medicinal quality by quantifying medicinal compounds present, and safety by setting a maximum of acceptable levels of pesticides, heavy metals, and other potentially harmful additives (GHKSAR, 2018). As herb practitioners, we can make sure the herbs we use in clinic come at least with a Certificate of Analysis that verifies authenticity, quality, and safety, in accordance with HKCMMS, or other governing bodies. To narrow down our choice for herbal sources further is more complex, but modern solutions are growing in availability.

As worldwide demand for raw herbs from China catches up to or surpasses supply, cultivators are more likely to use mono-cropping techniques, fertilizers, and pesticides, resulting in poor herb quality, or wild-harvesting for herbs further into and depleting forests (Li, *et al.* 2015). Worldwide demand will continue to grow, and

practical alternatives outside of China warrant exploration. Some herb cultivators outside of China have successfully grown herbs far from their place of origin. For example, Peg Schafer has organically grown and harvested over 250 herbs according to Chinese tradition at her Chinese Medicinal Herb Farm in Petaluma, CA.

Where technology stands to provide the incentive for farmers, practitioners, and patients, to invest in organically and locally grown herbs, is the lab-tested proof of premium amounts of medicinal compounds. Already, we have some scientific evidence, as two samples of organic Dan Shen from Peg Schafer's Chinese Medicinal Herb Farm showed via High Performance Thin-Layer Chromatography, to have the highest levels of bioactive components, when compared to nine other Dan Shen samples from Taiwan, Hong Kong and San Francisco Chinatown (Schafer, 2011). For farmers to have an incentive to venture into CMM farming, we as OM practitioners also need to build market demand for high quality, local, and sustainably grown herbs. The last and most pivotal step is to empirically demonstrate improved patient outcomes from locally sourced herbs.

Both MM and OM are empirical sciences, though MM tends to isolate pathologies as well as compounds, whereas OM tends to look at the whole picture, and use whole herbs in synergistic formulas. OM practitioners need to be involved with the design of these studies, or better yet, fortify their own education with modern scientific research training, or else key mechanisms may be missed due to the differing foundational theories between MM and OM. One example of a misled study of CMM, is a lab test done to verify the mechanism by which *Angelica sinensis radix* (angelica) helps to treat menstrual disorders. The tests revealed that angelica does not have estrogenic or progestogenic activity in lab and clinical studies (Liu, 2015). Any seasoned OM practitioner would know at once that the clinical use of angelica is usually used in combination with other herbs, and its action is to tonify and invigorate the blood, which might be better observed by *in vivo* analysis of blood flow and smooth muscle contraction of the uterus. Modern research, paired with the guidance of a thorough understanding of OM and CMM, are key to unlocking the potential for science and technology to help translate thousands of years of clinical use into empirical data, and give Medical Doctors the evidence they need to advocate for OM and the use of CMM.

We live in a time of paradoxes. Science and technology have allowed humans sustained growth, but at a price: and the health of climate, humans, and the earth, are compromised to unseen levels. CMM has a bright future in improving the health of the world, but not without the help of modern OM practitioners taking upon themselves the many important roles to play outside of the clinic. Luckily, we as herbal practitioners can skillfully, like we would an herbal formula, combine new and old wisdom to ensure the longevity of CMM and the *san zhen*, or the three treasures: heaven, human, and earth.

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