

Nurturing health with traditional herbal medicine

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As well as formulating all our organic products, I have run my own herbal practice in Bath since 1998. I'm a registered member of the Ayurvedic Practitioners Association, Register of Chinese Herbal Medicine and the Unified Register of Herbal Practitioners. All this with the aim of using the principles of Ayurveda (the ancient art of living wisely) to help create positive change and positive health. Inspired by my time in India, I love cooking a vegetarian feast and rely on regular yoga practice and herbal supplementation to keep me well. I am passionate about running a business that inspires positive change and brings the benefit of the incredible power of plants to everyone we connect with. I live on a two-acre garden-farm in Somerset where I grow a rainbow spectrum of medicinal and nourishing plants for my bees and family to live from.

The growing threats to our biosphere urge us to reflect on how we care for our people and our planet.

This article looks at how traditional medicine can contribute more fully to sustainable healthcare and be more widely used in the medical community. It will explore some connections between Ayurvedic theory and modern scientific understanding and seek some common ground on which to base practical collaboration and potential solutions.

'By knowing one science alone one cannot arrive at a proper conclusion. Therefore a physician should study other sciences in order to arrive at a correct diagnosis.'
Sushruta Samhita (a major Ayurvedic surgical text from circa 100CE)

Traditional medicine systems (Traditional Chinese medicine or Western Herbal Medicine or Ayurveda) look at health and disease in ways that are alien to the way the scientific mind views the world. While the traditional herbalist, rather like a good gardener, is concerned with the health of a whole interrelated ecosystem, the modern doctor is more like a mechanic who sees disease as the breakdown of parts of a very intricate machine. Whereas Ayurveda perceives the body as a matrix of interconnected channels and systems, modern medicine focuses on the detail – even down to the biochemical and genetic level; Ayurveda on the other hand excels at taking in the whole picture. If we follow the advice of the great surgeon Sushruta, and listen, perhaps each perspective could make the horizon of the other clearer.

If Descartes and Dawkins are champions of theory, Einstein, Bohm and Goethe put great value on observation. Because we can all observe ourselves, each one of us is potentially an important scientist; but only if – as traditional health systems such as Ayurveda teach us – we refine our senses and can read the language of nature. The insights of great observers who did this revealed the benefits of plant medicines long before any chemical basis was discovered: a plant like ginseng (*Panax ginseng*), surviving through the harshest winters, can bring us warming strength because of its potent steroidal saponin activity; aloe vera (*Aloe barbadensis*), thriving in the hot desert, can soothe our burns (because of its polysaccharides); cinnamon (*Cinnamomum aromaticum*) thrives in the humid jungle, and its drying heat can help protect us from cold-damp obesity because its volatile oils help regulate insulin metabolism; sweet elderberry fruits (*Sambucus nigra*) help get us through the winter by uncoupling viral neuraminidase action.

It seems that understanding more about how plants adapt to extreme

conditions can tell us a lot about their beneficial health properties. Observing qualities in nature, rather than just measuring and weighing her, teaches us how important our perception is; that our life is ours to perceive. And as we experience the power of self-awareness and our connectedness with nature we may come to a place of awe and wonder, at the fact that life is a community. Then the story of life shifts from being about selfish genes to one of sharing and reciprocity; of life as part of the wholeness of the universe.

A health balance

All biological systems must strive for homeostasis; the processes of self-regulation that all organisms maintain themselves. Both Ayurveda and modern physiology recognise that health requires the balance and regulation of the internal systems. In Ayurveda the goal is the equilibrium between the constitutional *dosha*, the seven tissues, the digestive fire (*agni*) and the bodily wastes. Significantly, the Ayurvedic word for health (*sva-stha*) means ‘to be established in your self’. Whereas for modern medicine this regulation is achieved through chemical pathways and feedback, Ayurveda attributes it to the working of the humoral processes of *vata*, *pitta* and *kapha*. Both ways of looking at regulation have their place. If we know how and when to use one or the other paradigm we may better learn to serve the healthy and the ill.

Elemental healing

Surprisingly, modern science and Ayurveda share the view that all matter is composed of certain basic building blocks. For science this is the atoms and molecules. Atoms have a nucleus, protons and electrons and when they combine they make the countless different molecules that form all kinds of matter whether solid, liquid or gaseous, depending on temperature and pressure.

In Ayurveda five ‘elements’ (*panch mababbuta*) are said to combine in different proportions to make up the material universe and all living organisms.

The five primordial elemental states are

Space/ether
Air/motion
Fire/heat
Water/fluid
Earth/solid.

In addition their equilibrium influences health and disease. For instance their balance determines a food’s nutritional properties and the healing properties of plant medicines.

‘According to Ayurveda all matter is constituted of the five elements (panchmababbuta). Some parts of matter are animate and others are inanimate.’ Charaka Samhita

The five elements are more like ‘states’ of matter with different qualities, rather than the periodic table’s atomic elements.

Earth qualities are dense and heavy; the substantial neutrons and protons that give mass and substance to an atom.

Water is a connecting and structural quality, the cohesive tendency holding the atom together and helping it join with other atoms to make molecules.

Fire is the tendency towards combustion and metabolism. At the atomic level energy is unleashed when electrons are freed from their orbits. In molecules such as adenosine triphosphate (ATP), energy stored in high-energy phosphate bonds is released when these bonds are broken.

Wind is the quality of motion reflected in the tendency for movement of electrons circulating around a nucleus.

Ether is the subtle element of space, the space that exists in the subatomic emptiness as well as the space between the stars.

Elemental physiology

There are similarities between the concept of the constitutional types (*doshas*) and modern physiology (see Hankey 2005a).

The three doshas (tridosha)

‘Vata, pitta and kapha move in the whole body producing good or ill effects upon the entire system according to their normal or provoked states. Their normal state is known as ‘natural (prakriti)’ and their abnormal state is ‘unnatural (vikriti)’

Charaka Samhita

Every biological system requires three simple functions: information coming in and going out, energy management, and energy storage within a physical structure.

Vata dosha oversees the input-output function, carrying food through the intestines, water in and out of cells, gases in and out of the lungs and is responsible for information movement across cell membranes regulating the nervous system and immune system. *Pitta dosha* manages this energy by regulating digestion, controlling metabolism and overseeing the cellular generation of energy.

Kapha dosha takes charge of the storage of this energy in the form of fats in the cell membrane and carbohydrates in the cell wall to give lubrication, structure and form to the whole organism.

Vata

This master control system is mirrored by the regulatory function of DNA in the nucleus of every cell. *Vata* facilitates and guides the functioning of the cells just as the DNA holds the codes that turn on and off the processes that regulate the organism. At the centre of every atom is

space, and it is the element of space and air that dominate in vata's expansive nature. It is vata's message-transferring tendency that moves information and nutrition across cell membranes. The same principle regulates the movement of information and feedback throughout the whole system. Vata is intimately related to the nervous system.

Vata disorders often involve cold-dryness – the releasing of gas, or creation of spaces and erratic movements. Examples would be digestive gases causing IBS, or osteoporosis causing holes in the bones, or nervous system disorders with erratic spasms and shaking such as Parkinson's disease. In the context of a full Ayurvedic treatment strategy involving diet, exercise and mindfulness, numerous plants may help these symptoms from black pepper (*Piper nigrum*) assisting nutrient absorption to ashwagandha (*Withania somnifera*) nourishing the nervous system and treating osteoporosis (Pole 2006).

Pitta

Pitta has the qualities of managing and metabolising. At a cellular level, *pitta* manifests in the mitochondria that transform raw matter into energy. ATP is the universal currency of energy in the mitochondrial powerhouse and *pitta* is the powerhouse behind these metabolic functions. *Pitta* both releases and manages energy. Some physiological activities can be correlated to *pitta* functioning through the enzymes and hormones that control metabolism. They reflect *pitta*'s digestive, combustive and developmental functions, functions dominated by the seemingly contradictory elements of *fire and water*, where water controls the fire from raging out of control.

The digestive functions of *pitta* are found everywhere from cellular metabolism to the digestive system itself. Just as enzymes are catalysts, so *pitta* is a metabolic catalyst for the whole system. An imbalance in *pitta* is seen in gastro-oesophageal reflux disease (GORD), though routinely controlled with proton pump inhibitors, it can often be treated effectively with herbs such as licorice root (*Glycyrrhiza glabra*) and meadowsweet leaf (*Filipendula ulmaria*).

Pitta is implicated where endocrine imbalance manifests as an excess or lack of heat in the body: for example, menopausal hot flushes, from an oestrogen-progesterone imbalance or the coldness of thyroid underactivity. *Pitta* balancing herbs, such as shatavari (*Asparagus racemosus*) and brahmi (*Bacopa monnieri*), are both known to influence hormone levels.

Kapha

Kapha collects in all lipid tissue in the body as it coats and protects the inner organs. At a cellular level *kapha* gives structure to the cell in the fatty acid phospholipid bilayer of the cell wall. Its predominance of *earth and water* elements is mirrored in the body's moistness: in interstitial fluids, intercellular fluid, cytoplasm, synovial fluid, cerebral fluid and the myelin sheath. It also plays an important role

as the matrix of connective tissue that links the tissues of the body together. *Kapha* is the container just as an earthen vessel can contain water: cytoplasm within cell wall, blood and lymph in the vessels, tissues within skin, chyme within gastrointestinal tract and the neurons within the myelin sheath.

These structural and cohesive roles reflect the anabolic and creative *kapha* tendencies that exist internally. *Kapha* is about creating, building and holding onto energy. *Kapha* diseases often involve too much of this 'holding' tendency, for example congestive heart disease, high cholesterol levels and obesity are examples of diseases with patterns involving accumulation and congestion (Hankey 2005b). Ayurveda treats them using herbs such as arjuna (*Terminalia arjuna*) for heart disease and turmeric root (*Curcuma longa*) for balancing high cholesterol and in managing diabetes.

The importance of digestive health

Another connection between Ayurvedic theory and modern physiology is the importance of digestion. The functional processes of *vata*, *pitta* and *kapha* are mirrored by the activities of ingestion, digestion and assimilation. For example, if digestion moves too fast (*vata*) food cannot be digested; too slow and it putrefies; too many digestive secretions will burn the stomach and intestinal lining (*pitta*); too little digestive secretions (*kapha*) means that the food is not broken down properly. This link is further represented by the metabolic processes of catabolism, metabolism and anabolism, which help release (*vata*), activate (*pitta*) and store (*kapha*) energy. If any of these processes become either excessive or deficient they lead to disease (see Tillotson 2001 for further insights into the physiological links between Ayurveda and modern science).

These processes are obviously affected by what we eat. The work of Paul Clayton and Judith Rowbotham (2008) describing how our diets have declined in nutritional diversity since the Victorian 1870s exemplifies the value of diversity. About 100 years ago people in this country were eating over 100 species of plants, but for most people today it's now around 10–20. This means we are no longer bathing our cells in as broad a spectrum of plant protection as we have done throughout evolution, and this lack of nature's phytochemical health-soup is one of the reasons our health is suffering today.

A recent study illustrating the benefits of a broader plant-based diet carried out by the perfectly named Professor Blanchflower (Blanchflower *et al* 2012) suggested our happiness might be directly connected with the amount of vegetables we eat, apparently peaking at about seven a day. Traditional medicinal systems such as Ayurveda encourage a diverse diet including phytochemically rich digestive spices and herbal teas. There appears to be a simple way to nibble and sip our way to a little more happiness.

Herbs and the microbiome

Herbal medicine's complex phytochemical components may work indirectly by interacting with the microbiome in our gut. Since many plant compounds are not actually absorbed into the blood stream, they may instead initiate signalling through our own probiotic bacteria so that a chain reaction occurs from herb to gut bacteria to our physiology (Crow 2011).

Treating the whole

In Ayurveda, pathologies of excess (eg suppurative infections, fevers, growths) are treated using the principle of *samanya-visbesika* (equal-opposite) using substances with qualities that are opposite to the disease ('Substances having properties of heaviness, lightness, cold, heat, unctuousness get increased when other substances having similar properties are added. On the other hand substances having dissimilar qualities decrease their quantity.' (Dash and Sharma 1996). In principle, this is an allopathic approach: for example, cold inducing herbs such as andrographis leaf (*Andrographis paniculata*) are used for treating infectious fevers, or dry-natured herbs such as guggul resin (*Commiphora mukul*) for congestive damp, or hot quality substances such as ginger root (*Zingiber officinalis*) for cold diseases, and moisture enhancing herbs such as aloe vera juice (*Aloe barbadensis*) for dryness.

Conversely, according to the principle that 'like increases like', some deficient pathologies (eg fatigue, anaemia, compromised immunity) are treated by using herbs with similar properties to the deficiency. In principle, this is a homeopathic approach: for example, reproductive tissue can be stimulated with fertility tonics such as shatavari (*Asparagus racemosus*) which has been shown to have phytoestrogenic effects nourishes reproductive fluids through classical 'cooling' and 'unctuous' properties.

But does it work?

Historical as well as everyday clinical experience confirms that many diseases that are difficult to manage with modern medicine may be helped using cost-effective and low-side-effect herbal treatments. Simple infections, diseases of ageing, osteoarthritis, digestive issues, skin diseases and women's health are all strong candidates (McClure *et al* 2014).

Herbs can help our microbial defences. Some of the most favoured herbs in modern herbal practice are andrographis (*Andrographis paniculata*) (Poolsup *et al* 2004), echinacea (*Echinacea purpurea/angustifolia*), elderberry (*Sambucus nigra*), neem (*Azadirachta indica*) (Vanka *et al* 2001) and tulsi (*Ocimum sanctum*) (Mondal *et al* 2011). Their potential for helping mitigate the current antibiotic resistance crisis is enormous. Herbs can work independently but may also be used to enhance the effects of antibiotics (Hemaiswarya *et al* 2008). They can work as single plant medicine or be used

synergistically in multi-herb combinations (Wagner and Ulrich-Merzenich 2009).

Why then are we so recklessly using antibiotics when the history, tradition and science for using plant medicine is so robust (European Herbal and Traditional Medicine Practitioners Association 2013) and so much is now known about the impact of plant medicines on harmful microbes?

- **Herbs can destroy the microbial cell wall**

Essential oil compounds, such as carvacrol and thymol (the hot and spicy compound found in oregano and thyme) destroy the bacterial cell membrane rendering them inactive. Green tea also does this.

- **Herbs can inhibit bacterial defence systems**

Epigallocatechin gallate (EGCG), a polyphenol in green tea, impedes the enzymes bacteria release to deactivate antibiotic activity. Tannins also do this. Triphala, one of Ayurveda's most famous formulas made from the fruits of amla, bibhitaki and haritaki, is often used in anti-microbial formulas.

- **Herbs can disarm bacteria's antibiotic rejection system**

A system called the efflux pump which stops antibiotics entering the bacterial cell is a major cause of drug resistance. Some herbs by inhibiting this pump allow antibiotics to deactivate the microbe. Baicalen found in thyme and some *Scutellaria* species reverses MRSA resistance to ciprofloxacin by inhibiting the bacteria's efflux pump.

- **Herbs can inhibit quorum sensing**

Quorum-sensing is a protective mechanism that enables bacteria to rally defences against compounds toxic to it, for example by creating biofilms that act as inhibitory barriers (Chan *et al* 2011). Cinnamon, cranberry, garlic, ginseng and propolis interfere with this process, breaking down the matrix and preventing the microbes adhering.

- **Herbs can initiate mitochondrial disruption in the bacteria**

Herbs such as clove, dill and tea tree oil interfere with microbial energy cycles.

- **Herbs can inhibit viral replication**

By targeting viral proteins, herbs can disrupt the lifecycle and block the proliferation of an invading virus. Andrographis has been shown to do this with the cold sores caused by herpes simplex 1 and various flu viruses (Coon and Ernst 2004). Elderberry has been shown to deactivate the neuraminidase enzyme released by ten strains of flu (Zakay-Rones *et al* 1995).

The herbal paradigm also embraces the concept of strengthening immunity by galvanizing both innate and acquired immunity. Herbalists use a category of plants called 'immune modulators' to treat autoimmune, inflammatory and proliferative disorders. Plants such as astragalus root – *Huang qi* (*Astragalus membranaceous*), ginseng root – *Ren Shen* (*Panax ginseng*), ashwagandha root (*Withania somnifera*) are all used in conditions such

as chronic fatigue syndrome, chronic bronchitis and rheumatoid arthritis.

Why are plant medicines effective?

We have an extraordinary and complex physiology, and yet science has repeatedly shown that minute amounts of plant compounds can profoundly affect our physiology. Spicy compounds, aromatic terpenes, and colourful flavonoids in ginger, elderberry or turmeric help the plant flourish and it is clear that these substances can interact with the human organism and optimise adaptive responses: stop a virus replicating, help our nervous system ameliorate pain, boost our fertility and lift our mood. Why should this be so?

Plants have evolved ways of protecting themselves from invading microbes and extreme climates. For perhaps 10 million years humans have co-evolved alongside plants, so that the human organism is genetically adapted to the plant world. Consequently we readily respond to very small amounts of phytochemicals. Conversely, the last 100 years of modern medicine's use of high-dose single chemicals, to which humans are not so well adapted, has resulted in some remarkable success stories but also many infamous tragedies.

The big question of sustainable healthcare

We face an explosion of system-wide catastrophic and chronic disease. Diabetes, cancer and emotional disorders are, in the Ayurvedic view, imbalances that do not hugely benefit from the single chemical approach. As science starts to grasp the complexity both of living systems and the biosphere it will I hope soon conclude that a more developed system-wide approach to healing is now called for. Researchers have spent billions to tell us the obvious; that good health depends on good diet, exercise and lifestyle. Billions more have been spent trying to find single-molecule medicine that will cure diseases mediated by diet, lifestyle and environmental factors. But the dangers of modern pharmacology's 'magic' bullets are rearing their heads (Jernberg *et al* 2010) for modern medicine is now one of the major causes of premature death (Light *et al* 2013).

If, as it appears, our health system is collapsing under the weight of an unsustainable paradigm, might not traditional herbal medicine and holistic self-care become part of a more cost-effective and sustainable way to build a healthier society?

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