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Qi, fluids and the science of life

By Michael Ellis

While working as a shiatsu trainer I often encountered *the* key question from students, “How do I feel the qi? How do I separate the circulating qi from everything else I feel under my hands—skin, muscles, swellings, tension?”

IN WESTERN MASSAGE styles the therapist’s focus is on the quality of the musculature, and so while working on the body one must keep the musculoskeletal anatomy in front of mind, whereas in Eastern bodywork one’s mental imagery is subtly different. Although we also encounter a body with palpable skin, muscles and bones, we must filter that information into the background and instead hold in front of mind an intricate network of “energetic” channels and collaterals.

Usually students found useful the metaphor of the qi as being like a slow-moving river, flowing most strongly beneath the muscle layer but also infusing through it and forming a network of connected streams, tributaries and oceans.

Not only is this a workable mental image, but also, as it turns out, it’s anatomically and physiologically accurate.

In March 2018, the Nature Research journal *Scientific Reports* published a paper by a team from Mount Sinai Beth Israel Medical Center declaring a previously undiscovered organ in

the human body.^a “New organ discovered!” teased the ensuing headlines, like an echo down from the Dark Ages.

That’s right, despite all of the anatomical examination of the past century, its dissecting, scanning and imaging, modern science had overlooked an entire essential anatomical structure—hiding, as it were, in plain sight. It seemed incredible.

This was no minor gland, either, tucked away in some dusty corner of the abdominal cavity. So important did researchers realise it was to the body’s functioning and disease processes that they declared the newly identified structure merited full organ status.

The organ, in fact, turned out to be an expansion in our understanding of the interstitium—the fluid-filled spaces surrounding cells and tissues—particularly the complexity of its microscopic structure and the extent of its connectivity, but also its apparently integral role in bodily processes.

a. Benias, Petros C. et al, 2018, Structure and Distribution of an Unrecognised Interstitium in Human Tissues, *Scientific Reports* 8: 4947.



To cite the *Scientific Reports* paper:

Freezing biopsy tissue before fixation preserved the anatomy of this structure, demonstrating that it is part of the submucosa and a previously unappreciated fluid-filled interstitial space, draining to lymph nodes and supported by a complex network of thick collagen bundles... We observed similar structures in numerous tissues that are subject to intermittent or rhythmic compression, including the submucosae of the entire gastrointestinal tract and urinary bladder, the dermis, the peri-bronchial and peri-arterial soft tissues, and fascia. These anatomic structures may be important in cancer metastasis, edema, fibrosis, and mechanical functioning of many or all tissues and organs. In sum, we describe the anatomy and histology of a previously unrecognised, though widespread, macroscopic, fluid-filled space within and between tissues, a novel expansion and specification of the concept of the human interstitium.

So to the evident surprise of bioscience, layers of the body once thought to be dense connective tissue are in reality a series of connected, fluid-filled compartments, the integrity of which is maintained by a mesh of fibrous proteins. These micro compartments are found beneath the skin, around blood vessels, lining the gut, and in muscles and fascia, and together form networks that connect parts of the body previously thought unconnected. Fluid circulates through them; they drain via the lymph.

Let's note the finding that these structures are prevalent in areas of the body *subject to intermittent or rhythmic compression*. And also the researchers' belief that the structures are involved in *the mechanical functioning of many or all tissues and organs*.

Incredible.

Well, sure, *not* so incredible to those trained in traditional East Asian medicine. But satisfying, nonetheless, to have a Western explanation for the concept of the *San Jiao*, that elusive *fu* organ of no fixed address, for so long held up by rationalists as proof of Chinese medicine's naivety.

Even more importantly, this is an apparent validation of the Chinese understanding of

the infusion of qi through the body via a web of interlinked channels and collaterals, and also the descent in the body of fluids, all of which is driven by the rhythmical impetus of the Lungs. The interstitium as described provides the perfect anatomical template for the channel system of Chinese medicine; the vehicle for qi.

The researchers suggested that biomedicine had overlooked the extent of the interstitial system until now because the usual method for examining bodily tissue on microscope slides required draining away fluid, which immediately destroyed the organ's structure.

In other words, when the tissue was no longer alive, its fluidy micro structure effectively no longer existed. This observation precisely reflects the ancient Chinese concept that being the vehicles of life, the channels are no longer present in death.

As the late palpation specialist Professor Wang Juyi put it, "the channels are alive in the same way that one might consider the heart or lung to be alive."^b

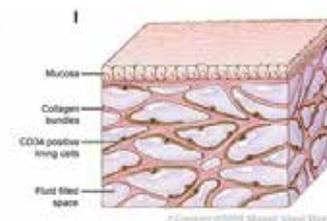
In a 2010 essay in *The Lantern*, he wrote: "When life stops, the channels no longer exist. Although we might still see spaces in the flesh, tendons and bones, these structures are no longer 'alive' in any sense of the word and are no longer channels in the Chinese medical sense. Thus the *Divine Pivot* assigns the channels the rather lofty role of 'determiners of life and death' as their very existence implies life."^c So here at last is a Western confirmation of what Eastern medicine has understood intuitively, and logically—and described empirically—for 20 centuries or more. For example, a passage from chapter 21 of the *Su Wen* (Simple Questions):

When imbibed fluids enter the Stomach, its warming, steaming action carries the essential qi to the Spleen. The Spleen then transports this qi, returning upwards to the Lungs, where regulation of the fluid pathways is initiated [through the Lungs' rhythmical impetus for descent]: fluids are transported downwards to the Urinary Bladder. The essential qi is spread outwards

b. Wang, Ju-Yi; Robertson, Jason D. (2008), *Applied Channel Theory in Chinese Medicine*. Seattle: Eastland Press, p.16.

c. Wang, Ju-Yi; Robertson, Jason D. (2010), On the nature of channels, *The Lantern*, Vol: 7-3.

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It's satisfying, nonetheless, to have a Western explanation for the concept of the *San Jiao*, that elusive *fu* organ of no fixed address, for so long held up by rationalists as proof of Chinese medicine's naivety.



Schematic showing the fluid-filled spaces supported by a network of collagen bundles lined on one side with cells.

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The unique vision of a separate fluid system with its own defined circulatory properties and physiological functions is the great discovery of ancient Chinese medical science.

– Wang Juyi

in the four directions, reaching the skin and pouring into the channels of the five zang organs. This is in accord with the [nature of the] four seasons and the yin yang of the five organs, and is part of the normal activity of the channels (*jing mai*).^d

To take up a non-contentious but rarely explored point, in the human body as in other life forms, *qi is attached to fluids*. Perhaps because it is self evident, this is seldom expanded upon in the available literature. In a body that's composed almost entirely of water, and not at all of empty space, *qi* cannot be gas, or even a discrete circulating substance (if it were a substance that could be separated out and bottled, it wouldn't be *qi*, by definition!) *Qi* must be bound up with the fluids or else it would simply fly off like wind and be impossible to control, useless to us.

This idea is central to physiology and pathology. Professor Wang explored the fluid nature of the channels in his 2008 book *Applied Channel Theory in Chinese Medicine*.^e He wrote in 2010 [just in case the Mount Sinai team considered labelling their paper “exclusive”]:

The channels are anatomical. They are to be found within the scope of normal physiological processes and, when there is abnormal function, they are also intimately involved in pathology. However, the mistake has been to think of the channels as a single anatomical entity that we might show in a medical atlas. Instead the channels might be better conceived as a system involving the regular movement of what we might broadly term “fluids” and the functional importance of these fluids in the human body. All of the organs of course have an intimate relationship with the watery milieu within which they function. Thus, if we consider the channels as describing the circulation and function of fluids, then the concept of channels moves to the very core of the “holistic” vision that characterises Chinese medical thought. In other words, the unique vision of a separate fluid system with its own defined

circulatory properties and physiological functions is the great discovery of ancient Chinese medical science.^f

Professor Wang expands upon this at length, pointing out the essential role of the channels as irrigators: “It should be emphasised that not only are the organs nourished by what Chinese medicine terms ‘channels’ but also that inter-organ balance is maintained by their irrigation. It is important to take note of the choice of terms here. ‘Irrigation’ (*guàn shèn*) describes a slow, gradual process in the body not unlike the measured provision of water to roots that ensures healthy plant growth.”^g

The inextricable relationship of *qi* and fluids is readily apparent when fluids are lost. A sure way to fatigue is to lose substantial amounts of fluid. If we bleed heavily; if we suffer from diarrhea; if we sweat too much; urinate too much; ejaculate too much; in all of these scenarios there is a consequence for the *qi*. It departs the body along with the fluids. In clinical practice, fluid deficiency and *qi* deficiency often co-exist.

Some people maintain that they like to drink water because they feel it “energises” them. Since water contains no *qi*, or raw materials for producing it, how can it add energy to the system? Perhaps it's that adding water to a parched or dehydrated system allows fluids to flow incrementally more easily—in the blood and in the other fluid pathways—and because those fluids can move more freely it requires less *qi* to move them; thus the person feels “energised”.

One of the ways of restoring *qi* to a depleted system is by restoring the fluids to a healthy state—replenishing them, or making them less damp and thus easier to move. It seems no coincidence to me that the most powerful *qi* tonic in the materia medica, *Ren Shen* (Ginseng Radix), simultaneously tonifies *qi* and fluids.

All the stuff of the body that circulates must continue to do so to remain physiological. When blood leaves its vessels and becomes static, it can no longer be considered “blood”. Likewise when fluids fail to circulate they become pathological, appearing as edema, or phlegm, unable to be converted back into

d. Clavey, S. (1995) *Fluid Physiology and Pathology in Traditional Chinese Medicine*, Seattle: Churchill Livingstone.
e. *Op. cit.*

f. Wang, Ju-Yi; Robertson, Jason D. (2010), *op. cit.*
g. *Ibid.* See also breakout box.

their original physiological substance. And qi that loses the attachment to its fluid becomes wind.^h

As an aside, because there are different forms of qi in the body, one may ponder whether wind also takes different forms, depending on which type of qi gives rise to it. Wind created by dysfunction of the channel qi may be different to the wind of the *wei* qi, because the nature of those types of qi is different. Channel qi wind is sudden uncontrolled movements like tics, cramps and spasms, whereas *wei* qi wind is more like flushing, skin rashes, or itching, or the hot symptoms of rising Liver yang—a separation of fire and water. Could there even be a wind of the *shen*? How about disturbed sleep due to the *hun* separating from its anchor in the Liver blood, giving rise to nightmares? This is another form of disorderly qi separating from a fluid—and substances that extinguish windⁱ and re-attach the fluids with the qi are required to treat it.

When palpating, it may indeed be useful to conceive of channel qi as something like activated fluid, by which I mean it has a movement dynamic that gives it a quality of aliveness. Blood has this quality; other physiological liquids, such as cerebrospinal fluid, also have it, whereas pathological fluids like phlegm and oedema do not; they feel inert. A part of the body, a channel or area of a channel that feels hollow or empty—that upon palpation we may conclude lacks qi—actually lacks qi *and* fluid. The fluid is the substantial part; the qi is what animates it. What creates the appearance of healthy, toned muscle? Qi creates the tone, but it cannot be qi that plumps out that healthy tissue; qi is not substantial. It must be fluids doing that aspect of the job.

As we age, our qi and yin, inextricably linked, diminish together. Our bodies are gradually depleted of both; we become drier, hollower, less flexible, more tired.

With findings such as the American research, it is gratifying to think that we may no longer

h. A definition gleaned from Volker Scheid (2014), “Qi dynamics: Rethinking Chinese medicine physiology”, seminar, Melbourne, Australia.

i. eg. *Chuan Xiong* (Chuanxiong Rhizoma) in the Liver-blood nourishing formula for insomnia, *Suan Zao Ren Tang* (Sour Jujube Decoction). Also *Chan Tui* (Cicadae Periostracum), a suitably light natured substance indicated for night terrors in young children.

On the channels, life and destiny

From Prof. Wang Juyi’s article, “On the nature of channels”:

After contemplating classical references while regulating the channels of patients for over 50 years, it seems that the role of the channels in the Chinese medical model might be summarised by the following two phrases:

1. The five zang organs preserve essence and thus rule destiny (五脏育精而主命, *wǔ zàng yù jīng ér zhǔ mìng*).

This phrase describes the basic fact that the organs are responsible for the processes of life. In Chinese medicine, these processes are thought of as a manifestation of essence. Growth, maturation and, eventually, decline and aging are all manifestations of the essence that comes to us in the womb from our ancestors. This is similar to the role of genetics in the modern model. The degree to which we fully express the potential of our genetics is the degree to which we realise our destiny. This is to say that our ability to live

to the longest and most healthy possible life is defined by the health and proper function of the organs (in particular the five yin organs). This is our potential.

2. The channels irrigate and thus rule life (经络灌渗而主生, *jīng luò guàn shèn ér zhǔ shēng*).

This second phrase describes the key prerequisite for realising the potential of the first. In order for one to realise what we are calling “destiny”, the organs must both preserve and manifest the essence (or enetic potential). In order for the organs to do this, circulation must be optimised. This is the role of the channels as irrigators of all the living tissues of the body. It should be emphasised that not only are the organs nourished by what Chinese medicine terms “channels” but also that inter-organ balance is maintained by their irrigation. It is important to take note of the choice of terms here. “Irrigation” (*guàn shèn*) describes a slow, gradual process in the body not unlike the measured provision of water to roots that insures healthy plant growth.

have to reach for metaphors or fall back on “20 centuries of empirical experience” when trying to explain Chinese physiology to sceptical Westerners, or to defend traditional East Asian medicine against the charge of being somehow unscientific.

It turns out the body works pretty much as Chinese medicine has long said it does, that qi is more than simply “a concept”, and that our explanations of anatomy and physiology are as valid, tangible—and useful—as those of biomedicine, sometimes more so.

Chinese medicine has been right all along. We could be forgiven for responding to the US research with: “Nice work, but we’re way ahead of you here.”

It’s a thoroughly satisfying development.

■ Michael Ellis is a registered herbalist in Melbourne, Australia.