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Future Health

IBS: East and West
Illness as a Vicious Circle

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ABSTRACT
This article compares the approaches of Western and Chinese medicine to irritable bowel syndrome (IBS), looking for parallels between them and ways they might inform, complement or confirm each other's theories and practice. A major theme is that IBS can be considered as a vicious circle, particularly from a Chinese medicine perspective.

Keywords: Irritable bowel syndrome, vicious circle, controlling cycle, primary pathological triad, *qi* mechanism, stress, bloating, abnormal motility, intestinal gas, visceral hypersensitivity, gut-brain axis, microbiome, dysbiosis, small intestine bacterial overgrowth, gut permeability, 'FODMAP diet'.

INTRODUCTION
This article compares the approaches of Western (WM) and Chinese medicine (CM) to irritable bowel syndrome (IBS), looking for parallels between them and ways they might inform, complement and confirm each other's theories and practice. A major theme is that IBS, like many other chronic illnesses, can be regarded as an example of a vicious circle. Other ones might include tension headaches, insomnia and chronic inflammatory conditions such as asthma. It is these more intractable illnesses where the pathogenic factors have become entrenched by a positive feedback system that practitioners are more likely to come across rather than the more commonly occurring, short-lived conditions such as viral illnesses and minor traumas in which homeostatic mechanisms usually rapidly restore the body to its normal, more healthy state of balance.

IBS is a combination of abdominal discomfort and irregular bowel habit that occurs in the absence of other diagnosed disease. There is usually distention, dull or cramping pain and flatulence. There may be diarrhoea, constipation or bouts of both; a feeling of incomplete emptying of the bowel and straining; urgency and frequency particularly in the morning; and rectal passage of mucous. Pain and other symptoms are often triggered by stress and eating, and relieved by bowel movement. Although it was once referred to as 'spastic colon' or 'mucous colitis', its realm extends to the small intestine. It is often associated with lethargy, nausea and other stomach problems, anxiety, depression, insomnia, backache, headaches and urinary frequency and urgency. In terms of symptoms, IBS can overlap to a considerable extent with fibromyalgia and chronic fatigue syndrome (CFS), and, in so far as they constitute distinct conditions, they can easily be confused with one another.

Estimates put the proportion of those who have an episode of IBS at some point in their lives at between 10 and 20 per cent in the UK but its incidence is probably much greater as many do not present for treatment. Predisposing factors include a period of stress; a low fibre diet; taking antibiotics; long-term use of laxatives; microbial and parasitic infections; and a history of psychological trauma. Roughly one tenth of sufferers report onset following an episode of gastroenteritis. This is known as 'post-infectious IBS' and its predominant symptom tends to be diarrhoea. Females are more likely to suffer from IBS than males (in the ratio of 1.67:1) and females with IBS are more likely to suffer from premenstrual syndrome and menstrual pain. It is more common in younger adults, peaking between the ages of 20 to 30. (1)

THE CHINESE VIEW
IBS as vicious circle
In Chinese medicine (CM), the primary imbalance in IBS is a Liver-Spleen disharmony in which stagnant Liver *qi* 'invades' the Spleen. (2) This is a pathological manifestation of the controlling cycle: the Wood element 'overacts' on the Earth element. This occurs where there is a combination of Spleen *qi* deficiency and stagnation of Liver *qi*. (The former may be due to irregular eating habits, past gastrointestinal infection, sedentary lifestyle, prolonged illness, overuse of antibiotics, analgesics and laxatives, overwork, worry or excessive mental activity; and the latter to frustration, anger and other pent up emotions, bottling up feelings, a stressful existence, lack of stimulating mental and physical activity, a problematic menstrual cycle, alcohol and drug intake or Blood deficiency.) The more deficient the Spleen, the more vulnerable it is to being invaded and, just as a bully picks on the weak, the more the Liver becomes emboldened to do so. A weak Spleen is said to 'invite' the Liver to invade. Equally, the greater the build up of stagnant Liver *qi*, the more readily and disruptively it is liable to do so. In invading the Spleen the Liver further weakens it. This creates a positive feedback system with a negative outcome, more colloquially known as a vicious circle.

Circles within circles
Other subsidiary interconnecting vicious circles feed into and reinforce this primary, pivotal one (various possibilities being shown in the diagram). Spleen *qi* deficiency, for instance, increases the likelihood of Damp accumulation and food stagnation, the more so if the Liver invades and food intake is excessive or overly rich (as it might be given that Spleen *qi* can cause a craving for sweet foods). Such accumulations further weaken the Spleen

and block the flow of *qi*. This *qi* disruption can be seen as a manifestation of the insulting cycle, the Earth element being said to 'insult' Wood.

Damp plays a major, integral role in IBS, the more so where there is diarrhoea and passage of mucous. Maciocia elevates it to a significance equal to that of stagnant Liver *qi* and deficient Spleen *qi*, stating that IBS is due to all three, in varying proportions. (3) Maclean at al refer to the 'primary pathological triad' which represents three patterns that tend to occur simultaneously in digestive disorders (including IBS): Spleen and Stomach *qi* deficiency, stagnant Liver *qi* and a mixture of Damp and Heat. Much of this Heat is generated by the pressure from the build up of stagnant *qi* and Damp. They claim the Western lifestyle is particularly 'attuned' to creating this combination due to a mix of stress, poor eating habits, sedentary lifestyle and overuse of medication (especially antibiotics and analgesics). (4)

Spleen *qi* deficiency, particularly when combined with a poor, low-protein diet, leads to Blood deficiency which inhibits the Liver in its function of ensuring the free flow of *qi*, Liver Blood being analogous to the lubricant of an engine, enabling smooth, friction free movement. As a result, Liver *qi* stagnation is aggravated, making stagnant Liver *qi* more inclined to invade the Spleen and weaken it, thus extending and at the same time giving an extra impetus to the primary vicious circle based on Liver-Spleen disharmony that is fundamentally responsible for generating and sustaining IBS. This link via the Blood is the main basis for the intimate, interdependent relationship between Liver and Spleen which is at the core of the problem of IBS. The Liver is dependent on the Spleen to provide it with Blood otherwise *qi* stagnates. The Spleen relies on the Liver to ensure the *qi* (of the Spleen, Stomach and Colon as well as of the Liver) flows smoothly, freely and in the appropriate direction – and not to go awry – otherwise the digestive function is compromised and insufficient Blood is produced to harmonise the Liver. However, when in disharmony, the Liver and Spleen behave like a warring married couple who, instead of being mutually supportive, continually undermine and abuse each other, with each new affront or withdrawal of affection further fuelling their antagonistic, enervating relationship.

The problem may be compounded by the loss of menstrual blood, which may explain the greater incidence of IBS among females; and by the overuse of the eyes as in excessive reading and screen gazing. The Blood is replenished in periods of sleep and rest, and Liver disharmony reduces the duration and quality of these. Liver Heat arising from constrained Liver *qi* may consume the Blood. Long-term Liver *qi* stagnation without significant Heat can damage the Blood by impeding the Liver in its function of storing the Blood, thus making Liver *qi* even more inclined to stagnate. According to Maciocia's mentor Dr Shen, improper storage can 'spoil' the Blood. (5) This particular subsidiary vicious circle in which deficient Blood and Liver disharmony mutually reinforce each other, also feeds into and helps to fuel the primary vicious circle centred on the Liver-Spleen axis. Blood deficiency additionally contributes by depleting *qi*, including Spleen *qi*, since *qi* relies on Blood for nourishment.

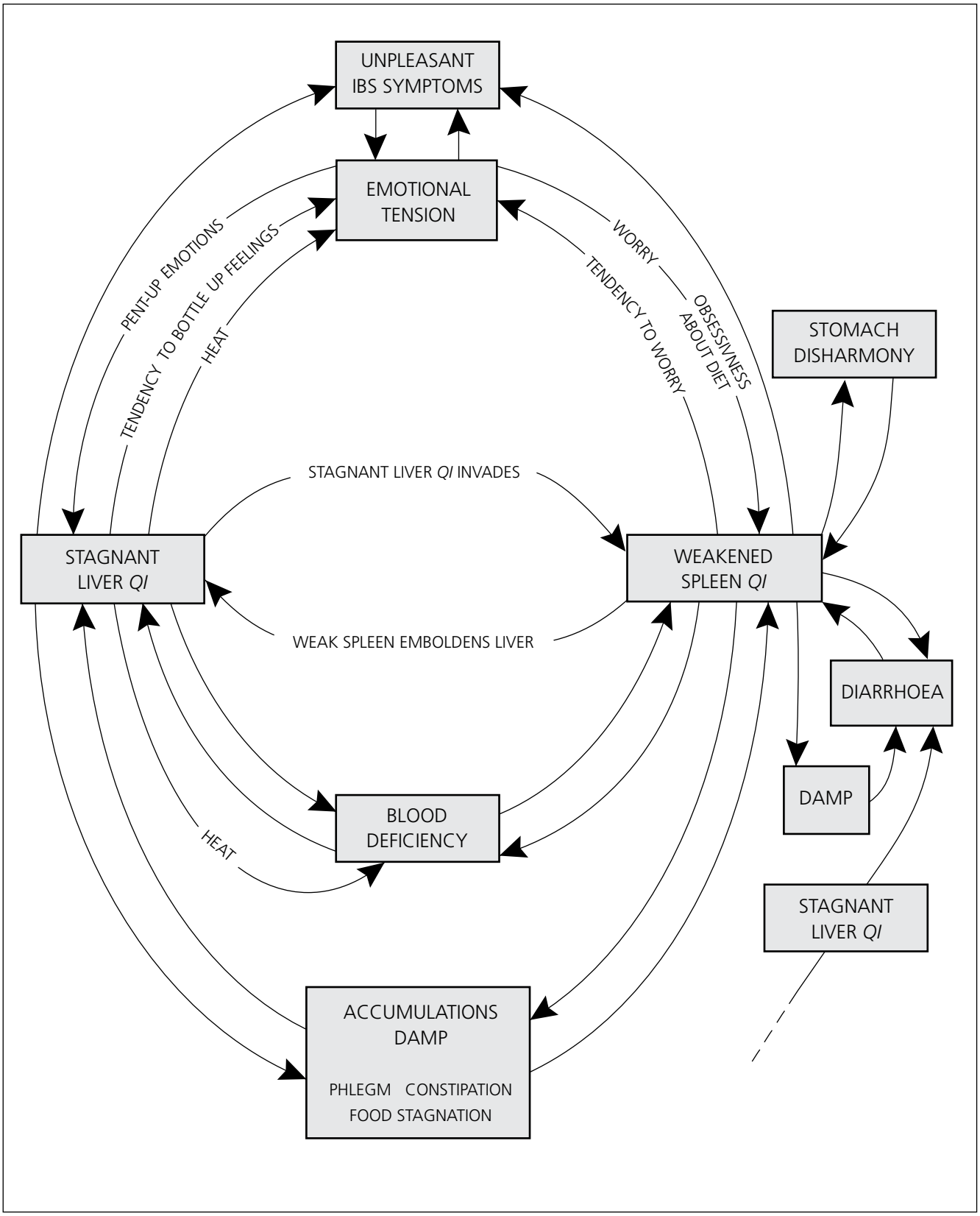
In a healthy digestion, the Stomach engages in an intimate, mutually supportive relationship with the Spleen. A fundamental aspect of this is the *qi* mechanism whereby the Stomach's descending action is ideally counterbalanced by the Spleen's ascending one (the latter being designed to hold the gut's contents in place long enough for the 'pure' food essences and fluids to be extracted and the 'impure' waste to be excreted appropriately). Any imbalance or deficiency in one is liable to have an adverse effect on the other, potentially creating another vicious circle. If the Stomach, for instance, fails adequately to descend *qi*, this increases any tendency to constipation, food stagnation and Damp accumulation, thereby undermining the Spleen. Equally if the Spleen does not give the Stomach sufficient *qi* or allows Dampness to accumulate, this may impair the Stomach's descending action and make it more vulnerable to invasion by the Liver. Stagnant Liver *qi* or backward pressure due to food stagnation or constipation may further impede the descending of Stomach *qi*, possibly causing it to rebel upwards in the form of nausea, belching and acid regurgitation.

The Colon also facilitates the descent of *qi* and thereby defecation. If Lung *qi* has been weakened or constrained by repeated infections, asthma (associated with IBS), shallow breathing (due to poor posture or emotional tension), grief or not being sufficiently nourished by Spleen *qi* and Blood, it may fail to support the Colon in this. Kidney deficiency can also play a role in IBS by failing to support both the Spleen, which relies on Kidney *yang* to give it sufficient warmth to transform and transport food and fluids, and the Liver whose Blood partly relies on Kidney *yin* for support and nourishment.

Aggravation: emotional reactions and dietary fixations

On a mental-emotional level, the pain, tiredness and other unpleasant symptoms may create or increase frustration, worry, anxiety and depression, further feeding the vicious circle by aggravating Liver *qi* stagnation (with the added potential complication of increasing any propensity towards comfort eating or eating in an unrelaxed way that may further compromise the digestive process). Worry 'knots' *qi* and, being associated with over-thinking, also depletes Spleen *qi*, especially if worrying occurs during eating. Sometimes anxiety centres on the timing and context of bowel movements, especially if these are problematic, with sufferers overruling the urge to go, possibly due to embarrassment, when in unfamiliar or public settings. This results in further *qi* stagnation and disruption of the Colon's descending motion which can eventually lead to establishing or reinforcing

IBS VICIOUS CIRCLE(S)



an inhibited, less frequent bowel habit, with the stretch receptors in the bowel wall being reset and thus failing to respond to the presence of a stool. (6) This may be a continuation of a pattern starting in childhood, possibly linked to anal retentiveness.

Spleen *qi* deficiency is linked to obsessive thinking and excessive self-monitoring which, in IBS, is liable to become focused on the digestion, making sufferers particularly prone to obsessiveness about diet and dieting. A fixation on diet, though an understandable response to IBS, frequently makes the condition worse (and sometimes triggers or causes it in the first place). Excluding certain food types can be beneficial but it may also lead to malnutrition or overloading the digestion with replacement foods that might be harder to digest, further depleting the Spleen. Highly restrictive diets may reduce the diversity of gut flora and adversely upset its delicate balance. Changes that ignore or go against the tried-and-tested folk wisdom built into traditional eating patterns run a high risk of being counterproductive.

The main problem with restrictive dieting, however, is the mindset that often underpins it. It is sometimes pursued in a compulsively driven or self-denying way, making some inclined to adopt extreme measures. Rigid restrictions can make meals unappetising and eating a worrisome and stressful experience, impairing the digestive process. They may also lead to overcompensating behaviour as when 'weight watchers' yo-yo between bouts of very frugal eating (often combined with fasting and skipping meals) and binging, torn between their internalised finger-wagging parent figure and their rebellious, self-indulgent 'naughty' child.

A common motivation is the perceived need to eliminate 'toxins' as in 'detox diets'. The sense of impurity or unwholesomeness implied by this notion can be seen as a modern-day resurfacing – in a somatic form – of traditional Christian concepts of sin and unworthiness, with dieting and other 'body cleansing' measures such as purging and colonic irrigation representing forms of purification and penitence. (7) This proffered path to salvation may be particularly appealing to those with IBS who might well be open to the idea that such symptoms as muzziness, fatigue, bloating and general malaise may represent a manifestation of 'toxins' or analogous types of contamination, linked to such factors as congested bowels, overindulgence, a 'leaky gut', an 'impure' diet or supposed food 'allergies'. There may be some truth in these notions but some 'detoxing' measures especially when over-applied can be very depleting and particularly inappropriate for those with weak *qi*. A view of the self as polluted by 'toxins' may reinforce the feelings of worthlessness and unworthiness on which it is often based.

Root and branches

According to Maclean et al., stagnant Liver *qi* causes diarrhoea by tightening the wall of the intestines 'leading to a reduction in the circulation of *qi* and Blood and reduced harvesting of the *qi* across the intestinal wall'. This gradually weakens the Spleen with the weakened Spleen producing Dampness that sinks downward, contributing to the diarrhoea. (8) Liver *qi* stagnation causes constipation by disrupting the flow of *qi* and inhibiting the correct downward movement of Stomach and Colon *qi*, which reduces peristalsis. (9) If Heat is created, stools become dry and hard, and correspondingly more difficult to pass.

Over time, both constipation and diarrhoea weaken Spleen *qi* but diarrhoea more so because then vital nutrients ('food *qi*') are not absorbed, more drastically depleting *qi* (and Blood). Diarrhoea, whatever its original cause, and Spleen *qi* deficiency are particularly liable to form a mutually reinforcing, antagonistic relationship, potentially spawning yet another subsidiary vicious circle (a downward spiral in this case) feeding into the wider, primary one, revolving around Liver-Spleen disharmony. The longer, more often and more forcefully the Liver invades the Spleen, the more depleted the Spleen becomes, making Spleen deficiency – as distinct from an overbearing Liver – an increasingly important factor in causing constipation and diarrhoea, especially diarrhoea.

The mantra 'treat the cause not the symptom', which serves as an article of faith for many practitioners of alternative medicine, does not take account of the fact that in IBS, as in other positive feedback systems, the symptoms or effects feed back into the system to become part of the cause or rather to augment the original cause. This is certainly true of diarrhoea and constipation. Likewise, pain may be a symptom of IBS, but by increasing emotional and physical tension, it ratchets up Liver *qi* stagnation which is what largely caused it in the first place. Causation in CM is typically mutual and bidirectional, circular rather than linear, which means that vicious circles are the norm in chronic illness and virtuous circles fundamental features of homeostasis and healthy functioning. The need to address symptoms (the 'branches') as well as the primary cause (the 'root') is acknowledged in Chinese herbal prescriptions for IBS which routinely include herbs to clear Damp, Phlegm and Heat; calm the Mind; move the stool or restrain diarrhoea; alleviate pain; harmonise the Stomach; and resolve food stagnation – as well as strengthen and, if necessary, raise Spleen *qi*; move Liver *qi*; and nourish and harmonise Blood. (10)

Ramifications and complications

Those symptoms and conditions associated with IBS in areas of the body other than the intestines, or more generally felt such as fatigue and mood disturbances, can be explained by the deficiencies and excesses created by or causing Liver-Spleen disharmony: deficient *qi* and Blood, stagnant *qi* and Blood, Damp, Heat, Phlegm and food stagnation. Most of these factors are also prominent features of CFS and fibromyalgia: hence the overlap in symptoms. As is the case when the Liver

invades the Stomach and Spleen, Liver *qi* stagnation is more likely to affect areas where pre-existing deficiency, imbalance or damage make them susceptible.

Stagnant Liver *qi* may spread from the intestines to impact upon or colonise adjacent organs, the bladder, uterus and genitals. Menstrual pain, dyspareunia, chronic pelvic pain syndrome (a form of chronic prostatitis) and 'overactive bladder syndrome', for instance, are linked statistically to IBS. The last is characterised by involuntary, premature contraction of bladder muscles and may largely correspond to the stagnant Liver *qi* pattern of frequent and urgent urination. (One hypothesis in WM is that this may be due to 'cross-organ sensitisation' and 'neural cross-talk' between colon and bladder). (11) The Spleen *qi* (and *yang*) deficiency characteristic of IBS may also undermine Kidney *yang*, thereby increasing any tendency to Damp accumulation and Blood stagnation, and thus contributing to menstrual, genital and urinary problems.

In the long-term, Liver *qi* stagnation can lead to (or reinforce pre-existing) Liver Blood stagnation, entrenching IBS at a level deeper and more intractable level than the *qi* level. This may generate more deep-seated depression, intense menstrual pain and structurally rooted conditions such as haemorrhoids (in WM partly caused by constipation and too much sitting) and diverticular disease. Endometriosis – a manifestation of blood stasis – is closely associated with IBS, with sufferers much more likely to also have IBS symptoms, the more so if misplaced endometrial tissue is located in the bowel region. However, both conditions share very similar symptoms such as bloating, pain and constipation making differential diagnosis problematic. Stagnation of Liver *qi* may generate Heat, leading to a heightened capacity for stress, restlessness, anxiety and anger, and for further vexing symptoms such as headaches and insomnia, further ramping up the emotional factors (and medication use) liable to exacerbate IBS.

From vicious to virtuous

However, in focusing on worse case scenarios, there is a danger of painting an overly pessimistic picture. IBS is not in itself a serious illness though it can be very unpleasant and persistent, and over time, if unresolved, has the capacity to set up the conditions that might cause one. In Western terms it is a functional disorder rather than one entrenched through structural changes, and there is no sinister cause such as autoimmunity at its root. Sufferers can and do seek advice and treatment and make beneficial lifestyle changes (for which there is much scope given the poor diets, irregular eating habits, lack of exercise, stressful jobs and the busy, pressured routines that are often features of their lives). Indeed many are impelled to change their lifestyle by its unpleasant symptoms – refraining from excessive or overly rich food intake, for example – pre-empting later more serious health problems, a case of an illness becoming one's friend. This counterbalancing self-limiting tendency, spurred on by the pain response, might help to explain the fact that there is as yet no definitive evidence that those with IBS, despite being encumbered with a dysfunctional digestion, have appreciably higher risks of developing bowel cancer and other life-threatening illnesses (although some research suggests a possible link with cardiovascular disease).

The vicious circle of IBS can be turned into a virtuous one. By removing or mitigating (if only partly or temporarily) factors such as stress and irregular eating that disrupt or deplete the digestion, it is possible to give the Spleen the opportunity to recover to the point it is strong and resilient enough to withstand – at least to a limited extent – the inevitable stresses and excesses of life (including coping comfortably with a 'normal' varied diet). The longer, for instance, that the Spleen is not invaded by the Liver, the stronger it becomes, making it less likely to be invaded. Likewise a strengthening Spleen copes increasingly better with occasional bouts of overindulgence without succumbing to (and thereby being weakened by) Damp accumulation and food stagnation. The removal of Damp or resolution of diarrhoea and constipation, if possible, can also help the Spleen to function more efficiently and become stronger. A stronger Spleen is able to nourish Liver Blood, making *qi* less inclined to stagnate or rebel. Smoothly flowing Liver *qi* facilitates adequate rest for Blood to be replenished and makes it less likely to be depleted by Heat or improper storage. A harmonious Liver and a strong Spleen are less likely to generate or succumb to potentially disruptive and depleting emotions such as frustration, worry and excessive thinking. If Spleen *qi*, Liver *qi* and Liver Blood are given a sufficient respite from the factors that deplete, disrupt or obstruct them, then the vicious circle can be reversed, and homeostatic mechanisms, that normally keep a healthy and cared-for digestion in balance, restored.

THE WESTERN MEDICAL VIEW

A syndrome in search of a cause

The Western medical diagnostic category of IBS, first coined in 1950, effectively serves as a catch-all discard box – or diagnostic last resort – for cases of bowel malfunction that cannot be satisfactorily explained by identifiable disease-causing anomalies such as structural or biochemical irregularities, autoimmune reactivity and infections. The absence of any detectable organic cause – as evidenced by observable physical or biochemical changes in body tissues and fluids – means that the condition is regarded as a purely functional disorder as opposed to an organic one (as are also CFS and fibromyalgia.) The condition is diagnosed solely on the basis of signs and symptoms. The diagnosis is usually given when colonoscopies and other tests can find no tangible signs of a disease process such as significant inflammation or bleeding, growths, adhesions, micropathogens or gluten sensitivity.

Western medicine (WM) has been challenged by IBS, struggling to account for, and sometimes reluctant even to acknowledge, the faulty functioning of the gut when it appears to have no identifiable organic cause. The lack of structural and biochemical markers also means it has not been possible to definitively delineate it and accurately measure its incidence (assuming of course it can legitimately be seen as a distinct unitary disease category as opposed to a hotchpotch of several related conditions characterised by different pathologies). WM is however pursuing some promising and imaginative lines of inquiry and is making some significant progress in identifying possible causal factors. Although there is still considerable uncertainty about its underlying mechanisms, it is thought to be linked to abnormal motility of muscles in the intestinal walls, emotional tension, increased pain sensitivity of the gut, imbalances in gut flora, problems digesting certain foods, fermentation and intestinal gas. Intestinal permeability ('leaky gut') and mucosal inflammation may also be involved.

Mood, motility and microbiome

Stress is seen as a major factor in triggering and exacerbating symptoms in susceptible individuals. The stress or 'fight or flight' response has a profound capacity to disrupt normal motility of the gut wall since, in the event of a threat, it is designed to void the bowels by causing spasming in the colon and then to suspend the digestive process by stopping the synchronised contractions and expansions of the gut wall muscles that constitute normal peristalsis. However, stress by itself does not appear to be sufficient to explain IBS since many seemingly highly stressed individuals do not develop significant symptoms. This implies that a necessary condition for individuals to become susceptible to IBS is that their digestion is inherently overly sensitive to stress and other potentially disturbing influences, or has become so due to being weakened, damaged or imbalanced by such factors as previous gastrointestinal infection, poor diet and antibiotic use.

In susceptible individuals, dysfunctional motility leads to irregular bowel habit and pain. The muscular movements of the intestinal wall tend to be uncoordinated and sporadic, sometimes with sustained or violent contractions or little if any peristalsis for prolonged periods. These may lead to diarrhoea, especially after meals, when the colon contracts strongly to move the liquid stool too quickly into the rectum, allowing insufficient transit time for water to be reabsorbed; and to constipation when the colon contracts just above the rectum leading to the retention and thus excessive drying out of the stool. Pain is partly due to overly strong contractions but also to build up of gas which may also be partly linked to impaired motility. Any discomfort is thought to be intensified by visceral hypersensitivity which refers to heightened sensitivity of the nerves in the intestinal walls of IBS sufferers. The perception of pain at lower than normal thresholds is thought to suggest abnormal central processing of painful stimuli.

Intestinal gas is largely due to fermentation by gut microflora of incompletely digested food in the colon but some can originate from the small intestine and stomach, including usually small amounts that may be swallowed. The amount produced varies considerably between individuals. It depends largely on the digestibility of foods eaten (beans being particularly problematic) and the composition of the gut microbiome, and may be significantly increased by gluten sensitivity and lactose intolerance. Although IBS has traditionally been attributed to higher gas volumes, this has not been supported by evidence. IBS sufferers complain of bloating and pain at normal gas volumes, ones that would present no problem to the normal individuals who can even tolerate artificially created high volumes without discomfort (please see later).

WM has explored the interaction between the gut and mood – including the possibility that the gut can affect mood – through the concept of a 'gut-brain axis'. This focuses on the way the gut and central nervous system communicate with each other by neurological and biochemical means, a process in which major parts are played by the vagus nerve; and by stress hormones such as cortisol which activate the sympathetic nervous system, and counterbalancing ones that activate the parasympathetic one, responsible for the 'rest and digest' response. The vagus nerve, the principle component of the parasympathetic nervous system (said to be at the 'interface of the gut-brain axis'), regulates food intake, digestion and gut barrier function. Its functioning can be compromised by stress which may not only disrupt digestive processes but also inhibit its anti-inflammatory pathways, lessening its capacity to dampen intestinal inflammation and reduce gut permeability. (12)

The gut-brain axis model has been expanded to include the gut microbiome, an ecosystem made up of bacteria and other micro-organisms. This reflects increasing research evidence suggesting that this has a strong influence on interactions between the brain and the gut, and plays a major role in generating or inhibiting gastrointestinal disorders such as IBS and inflammatory bowel disease. Psychological stress can, potentially, have a marked adverse effect on intestinal motility, permeability, secretion and sensitivity (thereby increasing any propensity towards IBS) but its ability to bring about these changes depends to some extent on the microbiome whose composition modulates underlying mechanisms that promote or inhibit them. One of these mechanisms involves mucosal immune activation which can be provoked by imbalances in the microbiome. According to Qin et al., 'stress-induced alterations in neuro-endocrine-immune pathways act on the gut-brain axis and the microbiota-gut-brain axis, and cause symptom flare-ups or exaggeration in IBS.' (13) The microbiome's effect on the gut-brain axis may even extend to

influencing mood. Quite a few studies show a link between gut microbiota and mood disorders such as anxiety and depression and also stress; and that probiotic therapy may be of benefit. (14) However, overall the findings of research in this area are inconsistent and not conclusive. It is still not clear whether differences in gut microbiota composition are the cause or result of mood disorders.

The gut has its own nervous system – the 'enteric' – which is able to operate autonomously though it does communicate with the central nervous system. It is responsible for peristalsis and secretion of enzymes and has been elevated by some to the status of a 'second brain'. It contains around 95 per cent of the body's serotonin. This neurotransmitter plays a major role in regulating gut motility, secretion and pain perception, and thus may have a significant bearing on IBS. (15) Since serotonin stimulates gut contractions, too little can cause constipation and too much, as is possible with the use of SSRIs, loose stools and frequency.

Dysbiosis refers to microbial imbalance and maladaptation including lack of diversity and being inappropriately located as in small intestinal bacterial overgrowth (SIBO). There is substantial circumstantial evidence, not yet conclusive, to support the view that dysbiosis may directly contribute to IBS: for instance, studies have shown that the gut flora of IBS sufferers tend to be different from non-sufferers; that IBS can develop after an acute gastrointestinal infection; that therapeutic manipulation of gut bacteria with probiotics and antibiotics can reduce IBS symptoms; that SIBO occurs in some IBS sufferers and this can produce IBS-like symptoms; and that methane produced by the bacteria, *Methanobrevibacter Smithii*, is associated with constipation and can reduce gut motility and postprandial serotonin production. (16)

There is some evidence to suggest that IBS, in a minority of sufferers (particularly those with postinfectious IBS), may be characterised by a low-grade mucosal inflammation in the intestines. This might help to partly explain the altered gastrointestinal reflexes (leading to irregular motility) and visceral hypersensitivity thought to be significant aspects of IBS. (17) Such inflammation may also help to explain gut permeability (due to an impaired intestinal barrier) which seems to be associated with IBS, especially the postinfectious form. Gut permeability, which allows harmful substances and pathogens to pass through the gut wall into the bloodstream, may play a role in generating gut malfunctioning and IBS symptoms, including visceral hypersensitivity. As well as possibly being caused by inflammation, it may also cause or exacerbate it, creating a potential vicious circle. There is evidence to suggest that increases in gut permeability may also be linked to stress and use of NSAIDs and proton pump inhibitors (18) as well as dysbiosis and a high fat diet.

Food intolerance, fermentation and gas

Food intolerance is a major factor in IBS. One possible reason for this is food hypersensitivity which is associated with gut permeability and inflammation. This occurs in coeliac disease and gluten sensitivity, where gluten enters the cells of the gut undigested, setting up an immune response. Another reason is that certain foods cause increased gas and water volumes due to malabsorption. A significant development has been to link IBS symptoms to the incomplete digestion and absorption of Fermentable Oligo-, Di- and Mono-saccharides And Polyols ('FODMAPS') in the small intestine leading to their fermentation by bacteria in the colon which produces gas (thereby causing distention and pain in susceptible individuals) and to their absorbing water whilst there which loosens the stool (increasing any tendency towards diarrhoea). (19) These short-chain fermentable carbohydrates include fructans (as in wheat and onions), galactans (as in legumes), lactose, fructose and polyols (sugar alcohols in artificial sweeteners and some fruits such as plums and apples). What is known as the 'FODMAP diet' is used to identify foods containing those 'FODMAPs' that an individual might find difficult to digest in order to restrict their intake. This is initially a strict exclusion diet followed by a phased reintroduction of specific 'FODMAPs' depending on tolerance. This diet has been shown to lead to considerable improvement in the condition in the short term and is often recommended by GPs.

However, like all diets that restrict the range of foods there is the danger of depriving the body of vital nutrients (and reducing gut flora diversity) in the long term as well as fostering disordered or obsessive eating patterns. The oligosaccharides, fructans and galactans, containing soluble fibre, paradoxically, also act as prebiotics feeding the beneficial bacteria that keep the problematic ones in check. Two studies have shown a reduction in beneficial bacteria such as bifidobacteria in faeces within three to four weeks of starting a strict FODMAP diet. Bifidobacteria has been found to be less abundant in IBS sufferers and its quantity negatively related to the level of pain they report. (20) Thus the FODMAP diet may be counterproductive if sustained beyond a few weeks. This may be particularly so among those with constipation since FODMAPs have an osmotic effect drawing in water and thereby making food waste move more easily through the colon and stools easier to pass. The longer transit time associated with constipation increases the time available for fermentation and hence gas production.

The commonly held view – sometimes given as a rationale for the FODMAP diet – that a major cause of IBS is higher than normal gas production has been questioned. Tests have shown that IBS sufferers do not produce significantly more gas than healthy subjects so this cannot explain IBS symptoms. However, increased gas volumes do seem to create problems

for the former although not the latter. (21) Experiments where gas is infused into the intestines have found impaired intestinal gas transit due to abnormal gut reflexes in IBS sufferers, possibly causing the build-up of uncomfortable pockets of gas. (22) Sufferers report that the symptoms of discomfort and sense of distention they experience with the infused gas are similar to their normal IBS ones whereas non-sufferers tolerate the infused gas well. The sense of distention often coincides with an actual, measurable increase in girth although this is not necessarily the result of increased gas. The abdominal wall muscles of non-sufferers possess a reflex action enabling them to contract to accommodate increased gas volumes unlike sufferers whose abdomens consequently protrude. IBS symptoms may be due to the location of the gas rather than overall volume. The gas infusion experiments found that impaired gas transit was more likely to occur in the small intestine than the colon and, when IBS sufferers complained of bloating, it coincided with pooling of gas there. Although sufferers are inclined to attribute their discomfort to the build-up of gas ('trapped wind'), this may also be due to other factors such as irregular muscular contractions.

Restricting gas producing foods which IBS sufferers have much greater difficulty handling does have the benefit of relieving symptoms and also taking the pressure – literally – off the digestion for a while, giving it a chance to recover. However, this does not usually get to the root of the problem and by reducing gut flora diversity may make it worse in the long term. But there is a middle way. It may not be necessary to ruthlessly cut out certain problematic foods but just to have less of them. Most Westerners have sufficient amounts of the enzyme, lactase, to break down lactose (though the capacity to produce this declines with age) and GLUT-5 and GLUT-2 transporters to help absorb fructose, provided consumption does not exceed a certain threshold. Although many people may possibly have a sensitivity to gluten (usually falling far short of coeliac disease), most of these can probably eat wheat in moderate amounts without any noticeable adverse effects. (23)

IBS EAST AND WEST: PARALLELS

Disease mechanisms and susceptibility

There are quite a few parallels between the Chinese and Western approaches to IBS. Both acknowledge the prominent role of stress, anger, depression, anxiety and other forms of emotional tension. Although initially resistant (the psychosomatic view of physical illness being largely the preserve of psychoanalysis and alternative therapies up to the 1970s), much of WM has come to enthusiastically embrace emotional tension as a major cause not only of IBS but of disease generally. However, the once widespread view that IBS might be predominantly psychosomatic has been revised in the light of increasing evidence suggesting that in many instances it may have a substantial physiological basis. The notion that stress is a primary cause of IBS was always questionable. Stress triggers or exacerbates many conditions (these being said to be 'stress sensitive') but these only occur in the first place if there is a predisposition towards them. Factors underlying this may be more appropriately regarded as the fundamental cause or causes.

In CM, emotional tension contributes to IBS mainly by increasing any tendency for *qi*, particularly Liver *qi*, to stagnate, although worry, sadness and fear also play a part by depleting Spleen, Lung, Colon and Kidney *qi*. Liver *qi* stagnation does not simply equate to being 'stressed' or otherwise emotionally charged up. These states, unless sustained or overly intense, do not in themselves lead to any significant or persistent build-up of Liver *qi*. Emotional responses such as stress, anger, sadness and even frustration, when appropriate, can be healthy expressions of vitality and the free flow of *qi*. Whether or not Liver *qi* stagnates when these emotions are elicited by stressful or emotionally charged situations depends to a large extent on whether there is a predisposition to do so. This predisposition may be seen as the pathological condition of Liver *qi* stagnation. On a psychological level, this manifests as tendencies to become easily stressed, angry and frustrated; to habitually suppress feelings and bottle up emotions; and to become stuck in stale ossified versions of these such as resentment, irritability, moodiness and depression. However, Liver *qi* stagnation is also partly rooted in the body, being linked to the dysfunction of the Liver *zang fu* and often due, at least partly, to more physical factors such as Blood deficiency. It can both cause and be caused by emotional tension, the two being mutually reinforcing. Though it overlaps with and largely subsumes emotional tension, it is a distinct and much broader concept.

In so far that not every person subject to substantial stress develops significant IBS symptoms, both WM and CM acknowledge that emotional tension is not sufficient in itself to generate IBS. WM talks about 'susceptible' individuals who have digestions more 'sensitive' to stress and other potentially disruptive influences. CM explains such susceptibility or sensitivity in terms of Spleen deficiency which makes the digestion vulnerable to invasion by stagnant Liver (as well as struggle to cope with other challenges such as rich foods). WM recognises that this sensitivity can be induced by some potentially depleting or disruptive factor such as a gastrointestinal infection. Thus 'sensitivity' implies some form of digestive weakness which could be seen as roughly corresponding to the Chinese concept of Spleen *qi* deficiency. (The fact many seemingly stressed individuals – even those with irregular eating patterns – do not succumb to IBS may also be due to their having less propensity for Liver *qi* to stagnate.)

Other Western notions of digestive deficiency or malfunction adduced to partly explain IBS – food intolerance,

malabsorption, visceral hypersensitivity, impaired intestinal barrier and dysbiosis – also to some extent correspond to Spleen deficiency. Gut flora irregularities such as SIBO also imply Damp or Damp Heat. According to Martin John who has extensively researched this field, the use of tonifying Chinese herbs (containing prebiotic components) may aggravate IBS where SIBO is present by feeding bacteria in the small intestine which leads to fermentation where it is not appropriate. This ties in with the CM view that Damp needs to be cleared before the use of a predominantly tonifying herbal prescription to avoid exacerbating Damp accumulation. Equally one reason the FODMAP diet might work is basically by depriving bacteria in the small intestine of the fermentable carbohydrates on which they feed and thrive. (24) Repeated antibiotic use impairs the digestion: in WM by causing dysbiosis; in CM, Spleen *yang* deficiency and Dampness.

The notion of abnormal motility of the intestinal wall muscles closely corresponds to that of Liver *qi* stagnation. Instead of flowing smoothly as in normal peristalsis, the flow of *qi* – even in seemingly non-stressful situations – becomes blocked, leading to irregular, disorganised muscular movements, sometimes with prolonged or extreme contractions, with the *qi* building up, possibly culminating in the form of painful spasms, and being released sporadically (if at all) by frenetic muscle movements. Disrupted peristalsis may also lead to the build-up of gas which causes pain and a sense of distention by exerting pressure on the nerve sensors of gut walls. Much of this stagnant *qi* may derive from pent-up feelings, transposed from an emotional-mental level to manifest on this physical one. It may also derive from more physical sources such as Blood deficiency, Damp accumulation, alcohol, lack of exercise and premenstrual syndrome. Impaired motility may also be due to deficient *qi* not providing the intestinal muscles with sufficient propulsive power.

In WM just as in CM, the liver and gut may interact pathologically. Gut permeability combined with dysbiosis may adversely affect the liver, causing non-alcoholic fatty liver disease (NAFLD) and hepatic inflammation, through the release into the bloodstream of lipopolysaccharides (also known as endotoxins) found in the outer membrane of gram-negative bacteria. It falls to the liver to filter out and deactivate these. A link has been hypothesised (but not yet demonstrated) between NAFLD and IBS on the grounds that they may share the same underlying mechanisms, there being evidence that both may be associated with a dysfunctional gut microbiome, impaired gut barrier and irregular motility. (25). In addition, those diagnosed with the diarrhoea predominant form of IBS often instead suffer from bile acid malabsorption. If bile acid is not reabsorbed by the small intestine (one possible reason being SIBO), it irritates the colon wall leading to diarrhoea. More recent research suggests that in some cases this may also be due to the excessive production of bile acid by the liver. It is notable that in both CM and WM the liver plays a central role in looking after the blood either through storing it or purifying and replenishing it.

CM considers the Spleen and Liver to have an emotional-mental component. The Spleen, the 'residence of thought', is responsible for thinking and the assimilation of ideas (and pathologically, for over-pensiveness; obsessive thinking; and inability to concentrate and memorise when studying). The Liver is responsible for assertiveness, resoluteness, hope and, as the 'house of the ethereal soul', the capacity for planning and finding a sense of direction in life (or on the flip side, frustration, inappropriate anger, despair and feelings of being constricted, blocked or directionless). In acknowledging that the gut – and even its microbiota – might have a significant input in determining mood and that it plays a large role in our emotional chemistry, WM also implicitly attributes to the gut an emotional-mental aspect (although it does not go so far as saying that as the 'second brain' it can have any semblance of consciousness or generate and experience emotions independently of the central nervous system). This acknowledgement does go some way to bridging the pronounced dichotomy between mind and body in the Western medical perspective.

Lifestyle factors

Both systems see the crucial importance of lifestyle factors in causing and sustaining IBS. Taking its cue partly from alternative medicine, WM has increasingly come to recommend changes in diet and eating habits, physical exercise, relaxation techniques, counselling, reducing sources of stress and securing a more equitable balance between work and relaxation (alongside of or often in preference to prescribing medication). CM has always placed great emphasis on maintaining regular eating patterns and a nutritious (but not overly rich) diet to protect and nourish the Spleen; on leading an active mental, emotional and physical life to ensure that Liver *qi* does not stagnate; and on getting sufficient rest and sleep to replenish *qi* and Blood.

The foods high in fermentable carbohydrates identified in the FODMAP diet largely overlap with those the Chinese think weaken the Spleen and create Damp and Phlegm – dairy (lactose), sugary foods (fructose) and wheat (which contains fructans). However, CM does not regard other foods containing fructans such as the onion and brassica families as problematic. On the contrary, being acrid in flavour, these are seen as aiding the digestive process. As regards legumes containing galactans, the Chinese often make these more digestion-friendly by fermentation as in miso. The nourishing and Damp draining properties that CM attributes to legumes is mirrored in the Western view that they may act as prebiotics.

CONCLUSION

IBS can be conceived of as a complex vicious circle with many mutually reinforcing factors potentially feeding into it. Both CM and WM agree that in IBS the digestive system is deficient or overly sensitive, often because it has been weakened or sensitised by such factors as stress, poor diet, antibiotics or an infection. The key to successful resolution – whether by therapeutic intervention or self-help strategies – is to remove or mitigate (if only partly or temporarily) the lifestyle and other factors that conspire to put a strain on the digestion, so that it has a chance to recover and thereby become sufficiently resilient to withstand the inevitable stresses and excesses of life. In terms of CM, lifestyle and attitudinal changes (usually crucial prerequisites for a positive outcome) may generally best be augmented by a treatment strategy that places emphasis, at least in the early stages of treatment, on clearing excess – particularly on regulating Liver *qi* and removing Damp – rather than tonifying, even though Spleen deficiency plays such a pivotal part in IBS. Premature or strong tonification of *qi* or Blood by cloying herbs or foods may overload an already struggling, overly sensitive digestion contributing to the build-up of Damp, Heat, Phlegm and stagnant *qi*. This may not only exacerbate symptoms but also indirectly further weaken the Spleen.

The fact that many factors often combine to generate and sustain the vicious circle of IBS means that there are many factors that can be moderated to turn it into a virtuous one. Paradoxically, those with the most unhealthy lifestyles may be potentially the easiest to help since they have more scope to make beneficial changes, although they may be less inclined to do so.

Despite their very different explanatory models – with CM using the climatic analogy (with notions of 'Damp' and 'Heat') and concepts of energy flow, stagnation and deficiency; and WM, the overarching framework of nerve-relayed electrical impulses, biochemical messaging and gut microbial ecosystem (and more specific concepts of dysfunctional motility, hypersensitivity, dysbiosis, gut permeability, malabsorption, fermentation and impaired gas transit) – there are a surprising number of parallels in the way WM and CM see IBS, especially the significance both attach to the interaction between the mind and the gut. There is also much scope for cross-fertilisation between them in the management and treatment of IBS.

WM has already taken on board some ideas and techniques that originated in the alternative therapy movement and Eastern traditions, recommending, for instance, psychotherapy and relaxation techniques such as yoga and meditation; co-opting traditional herbal remedies such as psyllium seed husks (as in 'fibrogel') and peppermint (as an antispasmodic); and also placing an increasing emphasis on a healthy diet and eating habits (including the use of yogurt and other forms of probiotics whose cause has been doggedly championed by alternative medicine). Equally TCM practitioners might well benefit from greater awareness of Western ideas and techniques. It might be useful, for instance, to bear in mind the insights and evidence underpinning the FODMAP diet when giving dietary advice and also, given the crucial role played by gut bacteria, the potential benefits of probiotics, prebiotic foods and a diverse diet.

One recent encouraging development has been a growing tendency to look at the way Chinese herbs interact with gut flora and the role they might have not only in fostering a healthy microbiome but through this also treating conditions such as obesity, diabetes, rheumatoid arthritis, and inflammatory bowel disease which have been tentatively linked to dysbiosis. It may well be that the therapeutic effect of Chinese herbs is largely due to the way they interact with the gut flora to restore homeostasis. (26)

The paradoxical notion that 'germs' – and dirt – can be beneficial (as regards digestion, metabolism, immune system and possibly mood) has strongly appealed to many in the world of alternative medicine hitherto wary of WM, making them more open to its potential input. In their eyes, this apparent volte face by WM seems not only to represent a partial climb-down from its aloof, aseptic, white-coated stereotypical image but also an endorsement of a Tolstoyan return to a more 'natural' way of living and healing. Margolin, in EJOM, for instance, sounding a rallying cry for the 'healthy gut movement', compares the microbiome to the body's 'soil'. (27)

However, it would be short-sighted to get carried away and assume, in a reductionist way, that illness can be predominantly explained and treated through the gut microbiome, as if medicine has at last found its holy grail. WM has its fads, fashions and bandwagons, eventually moving on to build new empires and orthodoxies around subsequent discoveries, insights and concerns, using different explanatory models. All scientific 'truth' is provisional and partial, and no one theory, type of explanation or tradition of medicine has a monopoly on it (at least not for long). Equally CM has its schools and fashions. This article has tried to show that IBS (and illness generally) can be profitably looked at from different, sometimes seemingly conflicting angles and perspectives – Western or Chinese, the psychological or physiological, attitudinal or nutritional, mechanical or chemical, neurological or microbiological, energetic or materialistic – all of which offer valuable pointers to its possible causes and suggest ways in which it can be treated and managed.

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